
FISHERY MANAGEMENT PLAN FOR U.S. WEST COAST FISHERIES FOR HIGHLY MIGRATORY SPECIES AS AMENDED APPENDIX A DESCRIPTION OF THE FISHERIES

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This appendix was Chapter 2 in the combined FMP/FEIS published in August 2003. Amendment 1 to the FMP moved it to Appendix A. It describes the domestic fisheries for HMS based on the U.S. West Coast as well as foreign fisheries for HMS in the Pacific Ocean.

A.1 Description of the Domestic Fisheries and Fishing Gear

This section provides a general descriptive overview of the economic and social environment for HMS fisheries.

The fishery for highly migratory species (HMS) consists of the fish stocks and participants involved in their commercial harvest, commercial use, recreational harvest, and recreational use. The principal HMS harvested by vessels fishing in the exclusive economic zone (EEZ) or based on the West Coast include: north Pacific albacore (*Thunnus alalunga*), yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnus obesus*), skipjack tuna (*Katsuwonus pelamis*), northern bluefin tuna (*Thunnus orientalis*), swordfish (*Xiphias gladius*), common thresher shark (*Alopias vulpinus*), pelagic thresher shark (*Alopias pelagicus*), bigeye thresher shark (*Alopias superciliosus*), shortfin mako shark (*Isurus oxyrinchus*), blue shark (*Prionace glauca*), striped marlin (*Tetrapturus audax*) and dorado (*Coryphaena hippurus*).

HMS are taken directly in fisheries that use many types of gears and vessels. Gears used to harvest HMS by directed commercial fisheries are primarily: surface hook-and-line, drift gillnet, harpoon, purse seine, and pelagic longline. HMS gears, and the corresponding primary target species, are identified by their state gear codes below:¹

State	Gear Code	Description
Albacore Surface Hook-and-Line		
CA	1	Hook-and-Line (rod and reel)
CA	2	Live Bait
CA	6	Jig (Albacore)
CA	7	Troll (Albacore)
CA	9	Troll (Salmon)
OR	120	Ocean Troll
OR	170	Tuna Baitboat
WA	41	Troll Salmon
Swordfish and Shark Drift Gillnet		
CA	65	Gill Net, Drift
OR	140	Ocean Gillnet
Swordfish Harpoon		
CA	12	Harpoon (Plank)
Tuna Purse Seine		
CA	70	Encircling Nets
CA	71	Purse Seine and Ring Net
CA	73	Drum Purse Seine
CA	75	Lampara Net
Swordfish, Shark and Tuna Pelagic Longline		
CA	5	Long Line, Set

The recreational fishery for HMS targets albacore, yellowfin, skipjack, bigeye and northern bluefin tunas, striped marlin, swordfish, dorado, and mako, blue and thresher sharks using hook-and-line gear. The fisheries are composed of both private angler vessels and charter vessels (also known as head boats and commercial passenger fishing vessels (CPFV)).

Most HMS and the fisheries they support are distributed internationally with components in the EEZs of Canada and Mexico as well as in international waters outside of any country's EEZ. U.S. vessels' participation may reflect not only changes in domestic fishery conditions, but also changes in conditions, including the status of stocks, resulting from international fishing. Also, landings may be affected as much by market conditions as by stock conditions. These factors give rise to considerable variability in annual U.S. landings of HMS and corresponding exvessel revenues (Tables 2-1 and 2-2).

To provide a sense of the global enormity of HMS fisheries, world catches of the major market species of tuna are reported in Table 2-3. Pacific-wide catches of bluefin tuna are reported in Table 2-4, and Pacific Ocean and world catches of swordfish are shown in Table 2-5.

A.2 Characteristics of the Domestic Fisheries

¹ Some of these gears may also be used in non-HMS fisheries. HMS landings and exvessel revenue summaries reported for these gears herein are based on vessel trips using these gears, where HMS were the species that accounted for the largest share of the total landings for the trip, i.e. HMS were considered the directed, or target, species.

This section describes the characteristics of the domestic fisheries: (1) the albacore fishery using surface hook-and-line gear and albacore harvesting using other gears; (2) the tropical tuna fisheries using purse seine, bait boat, pole-and-line, longline, and other gears; (3) the coastal purse seine fishery that concentrates on small pelagic species, especially northern anchovy and Pacific sardine, but which also harvest northern bluefin and yellowfin tuna when they migrate into the Pacific EEZ; (4) the swordfish and shark drift gillnet fishery and harpoon fishery; (5) the longline fishery based in California fishing for swordfish, tuna, and sharks beyond the EEZ; and, (6) the charter boat and private boat HMS sport fisheries.

Over the 1981-99 period, the most important HMS in terms of landings by all gear types were yellowfin, skipjack, and albacore tunas, swordfish, and common thresher shark. In recent years, the most important HMS have been albacore tuna, swordfish, and common thresher shark. By the end of the 1990s landings of yellowfin and skipjack tuna were substantially less than the amounts landed in the early 1980s. Bluefin tuna landings during the period were characterized by a high degree of variability. Through the 1980s and into the early 1990s albacore landings fell sharply, but by the late 1990s they had returned to relatively high levels of the late 1970s. Swordfish landings declined during the 1980s, but were on the rise through most of the 1990s. Common thresher shark landings followed a pattern similar to that for swordfish over the period. Landings of shortfin mako shark exhibited a fairly sharp decline over the 1981-99 period. Landings of pelagic thresher, bigeye thresher and blue sharks as well as dorado were relatively minor during the 1981-99 period (Table 2-1).

Over the 1981-1999 period, the most important HMS in terms of exvessel revenue (constant \$1999), were albacore and swordfish, except for yellowfin and skipjack tunas in the early 1980s (Table 2-2). Although variable, bluefin tuna exvessel revenues were comparatively high during the period. Swordfish and common thresher shark exvessel revenues peaked in the mid-1980s, and then declined rather steadily through 1999. Over the more recent 1994-1999 period, albacore exvessel revenues have ranged from \$12.4 million to \$28.6 million, yellowfin tuna exvessel revenues from \$1.5 million to \$5.9 million, skipjack tuna exvessel revenues from \$1.9 million to \$5.6 million, bigeye tuna exvessel revenues from \$0.3 million to \$0.6 million, bluefin tuna exvessel revenues from about \$1 million to \$4.2 million, swordfish exvessel revenues from \$6 million to \$10.5 million, and from \$0.5 million to \$0.6 million for common thresher shark. Exvessel revenues from other HMS sharks and dorado during 1994-1999 were much smaller (Table 2-2).

Based on quantities of HMS landings and exvessel revenues available from the Pacific Fishery Information Network Management Database (PacFIN) for the 1981-99 period, the albacore surface hook-and-line fishery was the major HMS fishery off Washington (Tables 2-6 and 2-7). There were occasional landings of other HMS in Washington, but they were relatively insignificant. Oregon's major HMS fishery was also the albacore surface hook-and-line fishery. Minor amounts of swordfish have been landed in Oregon in recent years (Tables 2-8 and 2-9). The bulk of the HMS fisheries occur off California. Early in the period tropical tunas dominated the HMS landings in California (Tables 2-10 and 2-11). However when the U.S. tuna industry moved its processing operations offshore in the early 1980s albacore, bluefin tuna, swordfish and sharks became more important in the landings.

A.2.1 Albacore Surface Hook-and-Line Fishery

The west-coast based U.S. albacore fishery is comprised of vessels that predominately troll for albacore using jigs, and to a lesser extent live bait. Together, these gears (and other hook and line gears used to target albacore, see above) are known as surface hook-and-line gear and account for the bulk of West Coast albacore landings and exvessel revenues (Tables 2-12 and 2-13). U.S. landings by the surface hook-and-line fishery over 1981-1999 ranged from a 1991 low of 1,638 mt to a 1996 peak of 14,075 mt. More recently, from 1994-1999, landings ranged from a 1995 low of 6,472 mt to the 1996 high of 14,075 mt. U.S. hook-and-line landings over 1994-1999 have centered around 10,000 mt to 13,000 mt. Exvessel revenues, in constant \$1999, of the U.S. surface hook-and-line fishery over 1981-1999 ranged from a 1991 low \$3,259,841 to a 1981 peak of \$45,214,132. Over the more recent period of 1994-1999, exvessel revenues in constant \$1999 ranged from a 1995 low of \$12,278,606 to a 1996 high of \$28,434,020.

The bulk of the U.S. catch is canned as white meat tuna at canneries in American Samoa and Puerto Rico. A small amount of the catch finds its way into the fresh fish trade, which is a significant income to these participants. Other gears catching albacore in small amounts include drift gillnets, longlines, set nets, and

recreational gears.

The U.S. annually takes less than 22% of the north Pacific albacore landed by all nations. U.S. troll vessels have fished for albacore in the north Pacific since the early 1900s. In recent years, the north Pacific albacore troll season has begun as early as mid-April in areas northwest of Midway Island. In July and August, the fleet moves eastward, fishing near 45° N latitude, 150° W longitude and along the West Coast of North America from Vancouver Island to southern California. Fishing can continue into November if weather permits and sufficient amounts of albacore remain available to troll gear.

The north Pacific troll fishery operates across the North Pacific and along the U.S. West Coast both inside and outside of the EEZ. Vessels operating outside of the EEZ are larger vessels, with no vessels less than 40 ft in length reported fishing outside the EEZ in 1998 and only 12 vessels less than 50 ft overall reported fishing outside the EEZ. The majority of the vessels operating beyond the EEZ are 50 ft or greater in length. By contrast, both big and small vessels fished inside of the EEZ.

The troll fleet is composed of an unknown number of vessels ranging from 16 ft to over 100 ft in length. The vast majority of vessels are 25 ft or greater. The total estimated number of vessels landing albacore peaked at more than 2,000 in the mid-1970s. Fewer vessels have been active in recent years with 741 reporting landings in 1996, 1,244 in 1997, 913 in 1998, and 775 in 1999. The number of larger vessels, greater than 50 ft, is relatively steady, ranging from 285 to 372 in the 1996 to 1998 period. In the years 1996 to 1998, the ratio of vessels less than 50 ft to vessels greater than 50 ft, was 1.6, 2.3 and 2.0 respectively, suggesting smaller vessels may move readily into the fishery as conditions warrant, and small vessels outnumber large vessels approximately two to one.

The South Pacific troll fishery annually takes about 2% of the total catch of South Pacific albacore. Exploratory fishing for albacore with troll gear in areas east of New Zealand in 1986 led to the expansion of the U.S. albacore troll fishery to the South Pacific. The fishery takes place during the austral summer months (November through April). The U.S. troll vessels that participate in the South Pacific fishery depart from the U.S. West Coast or Hawaii after the end of the North Pacific season and travel to American Samoa or French Polynesia to prepare for the South Pacific season. South Pacific albacore fishing areas extend from the Tasman Sea to approximately 110° W longitude between 25° S latitude and 45° S latitude. At the end of the season (in March or April), most troll vessels unload in American Samoa, Fiji, or Tahiti then travel to Hawaii or the U.S. West Coast to prepare for the next North Pacific fishing season.

Annual catch and effort in the U.S. south Pacific albacore fishery tends to be quite variable. Total South Pacific catch by U.S. troll vessels in the 1998-99 season decreased to 1,200 short tons (t) from 1,764 t landed in 1997-98 (Childers and Miller 2000) (Table 2-14). Twenty U.S. troll vessels participated in the 1998-99 South Pacific season compared to 37 vessels that fished in the 1997-98 season. Total fishing effort for the 1998-99 South Pacific albacore season is estimated to be 2,166 days, a decrease of 60% from 5,379 days fished in the 1997-98 season.

The basic troll vessel gear consists of between 8 and 12 (a few vessels use more) lines towed up to 30 m behind the vessel. Lateral spacing of the lines is accomplished by using outriggers or long poles extended to each side of the vessel with fairleads spreading 3 or more lines to each side, with the remainder attached to the stern. Terminal gear is generally chrome-headed jigs with varying colored plastic fringed skirts and a

double barbless undulated hook. The gear is relatively inexpensive. Retrieval is done by hand or by powered gurdies, similar to salmon troll vessels.

Carrying capacity of troll vessels varies greatly with vessel size from 4.5 mt to more than 72 mt with larger vessels in the 22.5-36 mt range. Fish are frozen aboard using chilled brine, blast and plate freezing. Many small coastal vessels still use ice. Transshipment at sea is used by some vessels to extend the effective length of a fishing trip which might otherwise be limited due to carrying capacity. Catches are landed at ports along the U.S. West Coast, in Hawaii, or at canneries in American Samoa or Tahiti. Transshipped fish is generally landed in American Samoa.

Albacore may be discarded because they are undersized. Albacore troll vessels catch minor amounts of other fish species, usually while in transit to or from the fishing grounds. The primary species caught incidentally include skipjack tuna (*Katsuwonus pelamis*), bluefin tuna (*Thunnus orientalis*), yellowfin tuna (*Thunnus albacares*), dorado (*Coryphaena hippurus*), billfish, and sharks.

A few troll vessels carry small amounts of live bait, which is chummed under some conditions to aggregate albacore and improve catches. Very few vessels operate with bait only. The description of these vessels and operations is found under Tropical Tuna, Pole-and-Line Fishery. Albacore is taken in modest quantities by U.S. longline vessels off American Samoa.

Vessels participating in the coastal purse seine fishery target albacore on occasions when they are available to the fishery in commercially viable quantities (section A.2.3). Drift gillnet vessels operating off California, Oregon and Washington, and longline vessels targeting swordfish, beyond the West Coast EEZ also harvest modest amounts of albacore (sections A.2.4.1 and A.2.5). There is also an important recreational fishery for albacore, capturing up to 1,500 mt in some years (section A.2.8).

Through the U.S.-Canadian albacore treaty, U.S. vessels can fish in Canadian waters and land in certain Canadian ports. A reciprocal arrangement holds for Canadian vessels. Table A-15 reports Canadian landings for the years 1995-1999 in the U.S. West Coast ports. Tables A-16 and A-17 report the percentages of catch and effort by fishing areas for the U.S. and Canadian albacore vessels, respectively.

A.2.1.1 Washington

Prior to 1972, albacore landings in Washington were relatively small, ranging from 40 mt in 1953 to less than 3 mt in 1971. In recent years relatively large amounts of albacore tuna have been landed in Washington, ranging from 1,864 mt to 6,517 mt between 1992 and 1999 (Tables A-18 and A-19). Recent variations in tuna landings and exvessel revenues have likely been an indication of changes in availability, rather than effort, as the number of vessels participating in the fishery has been fairly constant.

The two major ports along Washington's coast which receive the most landings of albacore are Westport and Ilwaco. In addition to Westport and Ilwaco, there are several other Washington ports along the coast and in Puget Sound which typically receive albacore tuna landings. Most Washington ports have fishers selling albacore tuna directly to the public, which is small in volume, but critically important to the financial survival of the participating fishers. There is also an important recreational fishery for albacore off the Washington coast.

A.2.1.2 Oregon

Oregon has had a directed commercial fishery for albacore tuna since 1936. Annual albacore landings and exvessel revenues in Oregon have been highly variable. Landings have ranged between 490 and 4,800 mt annually over the 1981-99 period. In the last decade, catches have averaged about 2,200 mt (Tables A-20 and A-21). Variability in landings can be attributed to a combination of factors such as oceanic conditions, weather and markets.

The albacore fishery off Oregon is made up of local, out-of-state, and Canadian vessels that fish from about 50 to several thousand miles offshore. The smaller, ice boats usually make 3-5 day trips, and larger, freezer

boats are out several weeks to several months at a time. In recent years, 300-500 vessels have landed in Oregon annually. In-state (Oregon) vessels made up 50-70% of the total fleet in the last five years. Also, in the last five years, the number of vessels from Canada that make landings in Oregon has increased. Oregon landings usually begin in July and continue through October. Newport and Astoria receive the majority of the landings with Charleston/Coos Bay third. About 90% of albacore landed goes to canned markets. In the last 10 years, up to 10% of the albacore has been sold by vessels directly to the public. In recent years, fishers and buyers have been looking to diversify into new, non-canned markets and product forms. Albacore fishing is also an important recreational activity off Oregon.

A.2.1.3 California

Albacore is a very important species for both commercial and recreational fisheries off California. Troll and baitboat are the principal commercial gears, although albacore is caught using purse seine, longline and drift gillnet gear as well. After a substantial decline in California albacore landings during the late 1980s, which also occurred coastwide, commercial landings at California ports rebounded in the 1990s ranging from 758 mt to 5,047 mt between 1990 and 1999 (Tables A-22 and A-23).

During the 1981-99 period an average of 200 vessels annually, that depended on albacore for the major share of their total exvessel revenues, landed albacore at California ports. The top five albacore ports in California based on average annual landings during the 1981-99 period were Terminal Island, Moss Landing, San Francisco Bay area, Eureka and San Diego.

A.2.2 Tropical Tuna Fishery using Purse Seine, Pole-and-Line, and Longline

A.2.2.1 Eastern Pacific Ocean

U.S. fishers harvest eastern Pacific yellowfin, skipjack and bigeye tunas with three main types of fishing gear, purse seines, pole-and-line (baitboat), and longlines. Some quantities are also caught with troll and rod-and-reel gears. Numbers and corresponding carrying capacities of tuna vessels using surface gear (purse seine, baitboat and troll gear) in the EPO are reported in Tables A-24, A-25 and A-26. Estimated tuna catches by surface gears in the EPO are shown in Tables A-27, A-28, A-29 and A-30.

Tropical tuna caught in the U.S. purse seine fishery are canned as light meat tuna. Catches have been delivered or transshipped to canneries in California, Puerto Rico, American Samoa, other canneries in the Pacific rim or to Europe. In 1980, there were 20 U.S. tuna processing plants in operation, declining to seven in 1990. By mid-1982, Bumble Bee had closed its plants in Hawaii and San Diego. In 1984, Van Camp closed its San Diego plant and Star-Kist closed its Terminal Island (San Pedro) plant. These plants were shut down because of their high costs of operation relative to foreign competition. Conditions that led to the closure of mainland tuna processing plants, and a major restructuring of the U.S. tuna industry during the 1980s and 90s are documented in four reports by the U.S. International Trade Commission (USITC 1984, 1986, 1990, 1992). Today only four U.S. plants are in operation, two in American Samoa (conventional canneries), and one in California and one in Puerto Rico, the latter two processing imported loins only.

Until recently, most of the U.S. purse seiners operating in the EPO have been Inter-American Tropical Tuna Commission (IATTC) class 6 vessels (more than 360 mt carrying capacity)², lately however, smaller purse seine vessels have outnumbered the larger vessels (Tables A-22 and A-23). The U.S. fleet of purse seiners in the EPO reached approximately 144 vessels in 1979 but by 1999, had decreased to 10 vessels (Tables A-25 and A-26). U.S. purse seine vessels employ a standard purse seine. Generally, three types of sets have been historically used: sets associated with schools of dolphin, unassociated free-swimming school sets and log or other floating object associated sets. Dolphin sets are now rare as most U.S. purse seiners currently

² The Inter-American Tropical Tuna Commission classifies vessels according to their carrying capacity into the following size classes: class 1, less than 51 t; class 2, 51-100 t; class 3, 101-200 t; class 4, 201-300 t; class 5, 301-400 t; class 6, more than 400 t (362.8 mt). Federal regulations classify purse seiners engaged in the tuna fishery into three categories: (1) Class I are vessels of 400 t carrying capacity or less; (2) Class II are vessels greater than 400 t but built before 1961; and (3), Class III are vessels are greater than 400 t and built after 1961.

operate in the central-western Pacific where this mode of fishing does not occur. In the central-western Pacific most (90% in 1999) of the purse seine sets are on artificial floating objects known as fish aggregating devices or FADS, the remainder on free-swimming schools. The remaining U.S. tropical tuna purse seine vessels in the Eastern Tropical Pacific now also set on fish aggregating devices. With most the U.S. tropical tuna purse seine fishing now taking place in the central-western Pacific catches are delivered or transshipped directly to canneries in American Samoa. Landings and corresponding exvessel revenues at West Coast ports have greatly decreased since the 1980s, when the major West Coast canneries began relocating overseas (Tables A-31 and A-32). Most of the tropical tuna landings on the West Coast are now made by “wetfish” (sardine, mackerel, anchovy) purse seiners that catch relatively small quantities of tropical tunas when they are seasonally available and which are separately discussed below.

In 1999, 10 U.S. purse seiners participated in the EPO tuna fishery, five in IATTC size classes 2-5, and five in class 6 (Table A-26). No tuna seiners have been constructed for U.S. documentation since 1990, and sales of existing U.S. seiners to foreign citizens are expected to continue in 2001. Since 1992, U.S. tuna vessels have been adversely effected by restricted access to historic fishing grounds located within the EEZs of EPO nations to the south of California. This kindled interest by many of the displaced vessels in purse seining for coastal pelagic species within the U.S. West Coast EEZ, particularly with the resurgence of the Pacific sardine. However, some were then thwarted by the limited entry program for coastal pelagic finfish instituted under the Pacific Fishery Management Council’s, Coastal Pelagic Species Fishery Management Plan.

The Inter-American Tropical Tuna Commission is an international convention with U.S. membership that provides the framework for conservation and management of tuna resources in the ETP. The implementing statute for the IATTC Convention is the Tuna Conventions Act of 1950.

No multilateral agreement is in force between the U.S. and other EPO Nations concerning the right of U.S. vessels to fish HMS within and beyond the EEZs of such nations. On March 15, 1983, the U.S. signed and ratified an agreement establishing a regional tuna fishing license arrangement the Eastern Pacific Ocean Tuna Fishing Agreement (EPOTFA). The “Eastern Pacific Tuna Licensing Act of 1984” (Title 16, United States Code, Section 972 et seq.; PL 98-445; 98 Stat. 1715) is the federal law which implements the obligations of the United States as set forth in EPOTFA. Although signed by the U.S., Costa Rica, Panama, Guatemala, and Honduras, the EPOTFA was never ratified by a sufficient number of signatory nations. Mexico did not sign the Agreement and actively opposed its ratification by certain signatory nations. Although authorized by the law, no federal regulations were promulgated by the Secretary of Commerce. The parties to the Agreement intended it to be interim in nature pending the negotiation of a more comprehensive management regime for the EPO tuna resources. The EPOTFA represents the world’s first international regional licensing arrangement for tuna fishing. It represents a model for the negotiation of a regional licensing agreement between certain South Pacific Island governments and the American Tunaboat Association for the South Pacific Tuna Treaty (discussed in greater detail following) (Hunt 1997). No bilateral agreements exist between the U.S. and other EPO nations concerning the right of U.S. vessels to fish HMS within the EEZs of such nations.

The bycatch of dolphins with large yellowfin tuna by purse seiners in the Eastern Tropical Pacific led the United States to initiate action within the IATTC to establish a program to address the tuna-dolphin problem (Joseph 1994, Scott 1996). In 1976, the U.S. initiative resulted in member governments of the IATTC agreeing to address the problem of dolphin mortality in the Eastern Pacific. The international efforts toward a solution to this dilemma resulted in an agreement – the Agreement for the Conservation of Dolphins or the La Jolla Agreement – reached in April 1992 by 10 nations involved in the fishery to progressively reduce dolphin mortality to levels approaching zero through the setting of annual limits and with a goal of eliminating dolphin mortality in this fishery, to seek ecologically sound means of capturing large yellowfin tunas not in association with dolphins (Joseph 1994). A schedule of progressively decreasing annual limits on dolphin mortality was implemented and a research program was approved. The overall annual limit is divided among vessels that intend to fish for tunas associated with dolphins and that meet certain requirements regarding fishing equipment and procedures and crew training. These vessels could apply for individual dolphin mortality limits (DMLs). DMLs would be calculated by dividing the annual limit for all vessels by the number of vessels requesting DMLs. Those vessels keeping within their individual DMLs can fish for tunas associated with dolphins all year, but those that do not have to abandon this mode of fishing for the rest of the year when they have reached their DMLs. DMLs are thus a quasi-property right rather than a pure property right, since

ownership is not conferred. DMLs are not transferable from one holder to another. The duration is one year, at which point it is reissued, with the amount depending on the number of candidate vessels and the total dolphin mortality set for the entire fishery.

The Panama Declaration reaffirmed the commitments and objectives of the La Jolla Agreement and seeks the transformation of a voluntary dolphin protection program that is based primarily on decreasing annual quotas into a binding international accord (Campbell, Herrick, and Squires 2000). In 1997, the U.S. Congress passed, and the President signed, the International Dolphin Conservation Program Act. In February 1998, the final language of the international agreement was agreed upon in La Jolla, California (Hedley 2001). This legislation required changes to the dolphin-safe standard in the Dolphin Protection Consumer Information Act. The changes included replacing the intentional set rule with a performance-based approach predicated on dolphin mortality in a given set. Under the proposed standard, dolphin-safe catches of yellowfin tuna would be identified by the set (deployment) of the purse-seine net and not for all of the sets made during a fishing trip as under the current standard. Dolphin safe would mean the absence of dolphin mortality in a set and not the absence of potentially dolphin-harmful techniques or dolphin mortality on a fishing trip.

U.S. baitboat fishers have harvested eastern Pacific yellowfin tuna throughout its range. The fishery uses live bait to attract surface schools of yellowfin tuna into a feeding frenzy and then fishers use poles with jigs attached to catch the feeding fish, hence pole-and-line gear. The catch from this fishery was 4,100 mt in 1979 but decreased to 500 mt in 1997. Catches are delivered or transshipped to canneries in California and American Samoa. Vessels range in size from less than 45 mt carrying capacity to 180 mt. The U.S. fleet size ranged from 28 in 1979 to less than 10 in recent years. While pole-and-line fisheries were the main gear used in the early days of the eastern Pacific yellowfin tuna fishery, catches and effort from this fishery quickly gave way to the more efficient purse seining method. In 1999, two U.S. baitboats participated in the EPO tuna fishery, IATTC size classes 1 and 2.

The longline fishery targets mainly swordfish and bigeye tunas. The U.S. longline fishery catches eastern Pacific yellowfin tuna mainly as an incidental catch species. Yellowfin tuna are caught in the northern extremes of the eastern Pacific yellowfin tuna range, between Hawaii and the West Coast, while targeting bigeye tuna. Catches have ranged between 350 mt in 1992 and 1,100 mt in 1997. Most of the catch is landed in Hawaii with lesser amounts in California. The catches are utilized in fresh fish markets and restaurants. Vessels range in length from 20 to 35 m. The U.S. fleet total (East and West Pacific) has ranged between 141 vessels in 1991 and 105 in 1997. The U.S. fleet uses a typical longline gear with a mainline up to 30 nm in length and a series of floats and branch lines. A set may fish 1,200 or more hooks. The gear is deployed at various depths depending on the target species sought and light sticks are used to enhance catches.

The U.S. longline fishery also catches eastern Pacific skipjack tuna as an incidental species catch. Skipjack tuna are caught in the northern extremes of the eastern Pacific skipjack tuna range, between Hawaii and the U.S. West Coast, while the vessels are targeting bigeye tuna. Catches have ranged between 1 mt in and 106 mt. Most of the catch is landed in Hawaii with lesser amounts in California. The catches are utilized in fresh fish markets and restaurants.

Eastern Pacific yellowfin, skipjack and bigeye tunas are also caught as incidental catch in U.S. troll fisheries and as target species in recreational fisheries. The latter is described in the Recreational Fishery section.

On July 6, 2000, two environmental organizations and a recreational fishing group filed a 60 Day Notice of Intent to Sue over violations of the ESA to protect endangered leatherback sea turtles and several other endangered species, including three other sea turtle species, seals, sea lions, and short-tailed albatross from being incidentally hooked and killed by US longline fishing vessels operating in international waters that are not operating under a Hawaiian longline permit. Hawaiian longliners are currently operating within the limits specified by the Biological Opinion prepared for the longline fishery.

US imports of canned tuna were up in 1999. Total imports reached 151,700 mt, which was 32% ahead of the 1998 figure. Thailand was again the main exporter of this product, shipping 75,100 mt, 80% more than one year earlier, mainly due to heavy purchases by StarKist in Thailand after the company reduced its cannery operations in Puerto Rico.

A.2.2.2 Central and Western Pacific Tuna Fishery

The central and western Pacific (CWP) tuna fishery is the largest and one of the most productive in the world, yielding catches of around one million short tons of tuna annually, with a landed value in excess of \$1.7 billion. These catches represent around one-third of all tuna landed in the world, 60% of canned tuna, and 30% of the sashimi grade tuna imported into Japan. The fishery is characterized by its complexity and area, with close to 30 states and entities involved in the fishery spanning over 30 million square kilometers of ocean, including a number of pockets of high seas surrounded by the coastal zones of the Pacific Islands.

The fishery operates year round throughout the CWP. The CWP purse seine fishery from all nations targets yellowfin and skipjack tunas, also with substantial catches of bigeye. Skipjack tuna is the dominant species in the CWP by volume of landings (Table A-33). The catch of skipjack increased dramatically in the 1980s due to growth in the international purse seine fleet, combined with increased catches by domestic fleets from the Philippines and Indonesia. Yellowfin tuna catches in the 1990s by all nations have varied between 300-400,000 mt, with around 60% of this total taken as juvenile fish in the purse seine fishery. As with skipjack, yellowfin is believed to be currently exploited at sustainable levels. Bigeye tuna of sashimi size and quality are the most valuable of the tropical tunas and are the principal target of large distant-water longliners who freeze catches and the smaller, locally-based fresh sashimi vessels. There has been a recent trend for purse seiners to use gear and techniques to target bigeye. The purse seine catch of adult bigeye exceeds that taken by longliners and is sold for canning at prices at or below that paid for skipjack. The present condition of the bigeye stock is uncertain. The EEZs of the Federated States of Micronesia, Papua New Guinea, Kiribati, Palau, and the pockets of high seas between these zones are the primary areas for purse seine fishing in the CWP (Lodge 1998).

In the late 1940s, tuna fishing ventures were established in Pago Pago, American Samoa, and in the Trust Territory of the Pacific Islands. Until the late 1950s, the traditional grounds of the eastern tropical Pacific were more profitable than in the CWP (Lodge 1998). Purse seining began on a significant scale only in the 1970s. In the late 1960s and early 1970s, largely as a result of decrease in the length of the fishing season in the Inter-American Tropical Tuna Commission area, U.S. fishers began to actively search for new fishing opportunities in the CWP (Lodge 1998). Concurrently, Congress passed the Central and Western Pacific Fishery Development Act of 1972 (the Fong Bill), which authorized the U.S. Secretary of the Interior to carry out a three-year program of incentives to industry to develop the latent tuna resources of the CWP. Exploratory fishing in Papua New Guinea and Micronesian waters in the early 1970s led to the first of a series of agreements between the American Tunaboat Association and the governments of the Trust Territory of the Pacific Islands in the late 1970s granting access to U.S. vessels to the waters of the countries concerned. During the late 1970s and early 1980s, the processors Star-Kist and Van Camp and U.S. fishers made investments in Guam and American Samoa. The Japanese also began experimenting with purse seining and by 1976, eight Japanese single purse seiners began year-round fishing. During the 1980s, the U.S. fleet continued to expand, reaching 67 purse seiners at one point. Since the conclusion of the Treaty on Fisheries Between the Governments of Certain Pacific Island States and the Government of the United States of America (South Pacific Tuna Treaty, SPTT) in 1987, the number of U.S. vessels has declined (Table A-34). In the early 1980s, Taiwan entered the CWP tuna fishery, with nearly all vessels built in Taiwan. The Korean fleet also expanded at this time.

The CWP had 601 participants in the tropical tuna purse seine fishery in 1997, ranging in carrying capacity from less than 46 t to over 2,000 t. The number of large purse seine vessels (greater than 363 t) is estimated to be more than 150, including 36 licensed U.S. vessels in 1999, which made 175 trips (Table A-35) (Coan et al. 1999).

In the CWP, the U.S. vessels in 1998 were 39 and made 200 trips (Table A-35). Since 1997, the number of U.S. purse seiners has fluctuated between 35 and 39, with the average carrying capacity per vessel increasing steadily from 1,122 t/vessel in 1996 to 1,184 t/vessel in 1999, an increase of approximately 6%. Available records indicate that two vessels in both 1998 and 1999 underwent capacity modification. This trend of increased carrying capacity is continuing into 2000 (Coan et al. 1999). The U.S. vessels fished under the South Pacific Tuna Treaty. In 1999, the U.S. fleet in the CWP conducted 4,758 days of fishing (Coan et al. 1999). This effort was concentrated mostly in the area between Kiribati and Tuvalu. Over 64% of the fishing

effort was in areas west of the International Date Line. The number of trips per U.S. vessel was approximately 5, and similar to those recorded for the last nine years. The average number of days per trip was 41.5 and sets per trip was 208.8, a decrease of 11% and 24% respectively from 1998 levels. The overall catch rate (all species combined) in 1999 was 38.3 mt/day fished, and is the highest recorded for the fishery (Table A-36). This high catch rate is largely attributed to increased use of drifting fish aggregating devices.

In the CWP purse seine vessels catch tunas through either free-swimming schools or off of floating objects. Floating object operations are increasingly important. The bycatch may be large for operations on floating objects or Fish Aggregation Devices (FADs) and smaller for operations on free-swimming schools of fish, and includes small tunas, sea turtles, sharks, and other fishes. The majority of the FADs used by the U.S. fleet are drifting FADs (Coan et al. 1999). A few anchored FADs are occasionally used. The U.S. fleet made approximately 3,478 sets during 1999. Of these, 90% were sets on FADs, 6% on logs, and 4% on free-swimming schools. In comparison, the 1998 fishing effort had 21% more days fished than in 1999. The total number of sets was 4,856 and only 25% was on FADs, 29% on logs, and 46% on free-swimming schools.

The U.S. purse seine fleet in the CWP caught about 182,000 t of yellowfin, skipjack, and bigeye tunas in 1999 (Table A-36) (Coan et al. 1999). About 72% of the catch was skipjack tuna, 19% yellowfin tuna and 9% bigeye tuna. The 1999 U.S. catch is 4% higher than the 1998 catch and would have been higher yet if low prices in the second semester did not discourage vessels from operating (Coan et al. 1999). The 1999 bigeye tuna catch is the highest recorded for the U.S. fishery, up by over 200% from the 1998 catch. This increase is attributed to the substantial increase in Fish Aggregation Devices. Seventy-eight percent of the U.S. fleet's catch was landed in American Samoa in 1999, a decrease from the 89% landed there in 1998. The rest of the 1999 landings were in the Philippines (11%), Fiji (5%), Solomon Islands (3%), and others (approximately 3%). The first year of substantial landings in the Philippines was 1999.

Fishing was exceptionally good in 1999 for the U.S. fleet, but market conditions created havoc (Coan et al. 1999). Supplies of tuna were plentiful world-wide and prices fell to record lows in the second half of the year. The oversupply caused exceptionally long delays in unloading of vessels in American Samoa and poor returns for vessel owners. A number of vessels opted to unload their catches (22% or 40,000 t) in ports to the west, such as in the Philippines, Fiji, and Solomon Islands, and scheduled early and extended tie-ups for maintenance and other vessel services to by-pass delays in American Samoa and to wait for improved prices. As a result, the number of days fished per vessel fell to the lowest on record for the fleet. The adverse economic effects of low exvessel tuna prices were compounded by rising diesel fuel prices, placing U.S. and other nations' vessels in a cost-price squeeze (Figure A-1).

In the CWP, the existing framework is the Treaty on Fisheries between Governments of certain Pacific Island States and the Government of the United States of America, or more informally, the South Pacific Tuna Treaty (SPTT). The SPTT is a multilateral, multi-year tuna fishing agreement with the island states of the South Pacific Forum Fisheries Agency (FFA). The SPTT established terms and conditions governing the U.S. tuna industry's access to the tuna-rich waters of the FFA nations' collective exclusive economic zones (EEZs). Under the SPTT, access was granted through an arrangement of fixed annual vessel license fees and technical assistance payments paid by industry, coupled with an annual payment from the U.S. government for development assistance. The SPTT limits the number of U.S. purse seine vessels to 50 (36 vessels in 1999), but there are no limits on access or numbers to tuna vessels on the high seas in the CWP. The FFA EEZ includes about 70% of the tuna resources in the CWP with the remainder found in the high seas. In addition to the SPTT, the Palau Arrangement (Arrangement for the Management of the Western Pacific Purse Seine Fishery), signed in October 1992, provides a limit, by vessel category of the numbers of purse seine vessels (currently 205) of all nations that may operate in the waters of Parties (Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea) (Aqorau and Bergin 1997).

The Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (MHLCP), whose negotiations were completed in September 2000, is a regional fishery management organization created in light of the United Nations Implementing Agreement (UNIA). The MHLCP is designed to perform the task of cooperative conservation and management between the Pacific Island nations and the distant-water fishing nations. The MHLCP is the first international multilateral fishing agreement to tackle sustainable management. The MHLCP has been signed by the U.S. and is expected to provide treaty

requirements and regulations in the next few years. Until that time, the U.S. is engaged in the SPTT.

A.2.2.3 Imports of Canned Tuna Into The U.S.

U.S. imports of canned tuna, both white meat and light meat, were up in 1999 (*GLOBEFISH Highlights* 1/2000, p. 9). Total imports reached 151,700 mt, which was 32% higher than 1998 (Table A-37). Thailand, once again, was the main exporter to the U.S., shipping 75,100 mt, an increase of 80% from the previous year. This increase is due to heavy purchases by StarKist in Thailand and a reduced presence by StarKist as a canner in Puerto Rico. Table A-38 presents average exvessel prices for tuna delivered to U.S. canners by U.S. vessels.

Under the new U.S. regulations, tuna products will be allowed to be imported into the USA if they are harvested in compliance with the International Dolphin Conservation Program Act. The regulations will also implement a new labeling standard that allow tuna products to carry a dolphin-safe label only if no dolphins were killed or seriously injured during a set in which tuna were caught. Previously, only tuna caught during a trip when no dolphins were encircled qualified for the dolphin-safe tuna label on products imported into the U.S.

A.2.2.4 Washington

There are no directed tropical tuna fisheries occurring off Washington (Table A-6).

A.2.2.5 Oregon

There has been no directed fishery for these species since the late 1970s. Two to four vessels, annually, have made incidental landings of less than 0.5 mt of skipjack and yellowfin tuna in the salmon troll fishery. There are no directed tropical tuna fisheries occurring off Oregon (Table A-8).

A.2.2.6 California

While no longer the home to any major canneries since October, 2001, California still maintains a substantial commercial fishery for tropical tunas. Several large purse seine vessels continue to use California as a home base, while a larger number of small "wetfish" seiners fish for tropical tunas on a more seasonal basis. These vessels may not be dependent on tuna as their principal target species, which are instead coastal pelagics; however, when tunas are available, these vessels will target on tuna for local markets. Total landings have been between 8,000 mt and 12,000 mt in recent years, valued at more than \$12 million per year (Tables A-10 and A-11).

A.2.3 Coastal Purse Seine Fishery for Northern Bluefin Tuna and Yellowfin Tuna

In the eastern Pacific Ocean nearly all of the northern bluefin tuna catch is made by small coastal purse seiners fishing relatively close to shore off California and Baja California, generally in the May to October period. As discussed above, larger U.S. purse seiners conduct distant water operations, mostly for yellowfin, bigeye and skipjack tunas. In 1996, the U.S. had 12 small purse seiners (class 1-3) and 10 larger purse seiners fishing in the EPO. West Coast landings and exvessel revenues from northern bluefin tuna were 689 mt and \$1,009,398 (1999 dollars) in 1995, and 4,639 mt and \$4,059,268 (1999 dollars) in 1996 (Tables A-31 and A-32). These landings were made mostly by coastal seiners, operating out of San Pedro, California. Almost all of the catch was landed in San Pedro. The coastal purse seiners primarily harvest small pelagic species, especially Pacific mackerel and Pacific sardine. However they will switch to higher valued northern bluefin tuna when they enter the West Coast EEZ. Similarly, they will target yellowfin tuna when they become available during periods of warm water. Coastal purse seiners will even target albacore on occasions when they are sufficiently available.

Northern bluefin tuna are caught incidentally in other U.S. north pacific commercial fisheries (Table A-39). Northern bluefin tuna is an important component of the U.S. recreational fishery although reported catches seldom exceed 100 mt per year. This fishery is described in the Recreational Fisheries section.

A.2.3.1 Washington

There is no northern bluefin tuna fishery occurring off Washington (Table A-6).

A.2.3.2 Oregon

Up to six vessels, annually, have made incidental landings of up to 6 mt of bluefin tuna in the swordfish drift gillnet fishery. There is no directed northern bluefin tuna fishery occurring off Oregon (Table A-8).

A.2.3.3 California

A large number of small purse seiners fish for northern bluefin tuna on a seasonal basis off California. These vessels may not be dependent on northern bluefin tuna, as their principal target species are coastal pelagics; however, when bluefin are available, these vessels will target on northern bluefin primarily for export markets. Total landings have been between 1,000 mt and 5,000 mt in recent years (Tables A-10 and A-11).

A.2.4 Swordfish and Shark Fishery

Swordfish and shark are harvested within the EEZ by two principal gear types, drift gillnet and harpoon.

A.2.4.1 Drift Gillnet

The shark/swordfish drift gillnet fishery initially developed in southern California in 1977 when the incidental catch of pelagic shark in small mesh coastal drift gillnets targeting barracuda and white sea bass inspired about 10 vessels to experiment with a larger mesh net to target thresher shark. By 1979 the fishery expanded to about 40 vessels (PFMC 1981). As fishing techniques and gear improved, landings, and market demand for pelagic shark increased. Fishers soon discovered that drift gillnet gear also caught swordfish, worth nearly four times the dockside value of sharks (Bedford 1987, Holts 1988). At that time, harpoon was the only commercial gear authorized under California law for the harvest of swordfish.

The California Fish & Game Commission held a series of public hearings in 1979 and 1980 to consider allowing drift gillnets to catch swordfish (Stick et al. 1990). At these meetings, the Commission heard from three major interest groups that had opposed the drift gillnet fishery since its inception. Harpoon fishers objected because they feared that increased swordfish production would drive prices down, and that increased fishing pressure would deplete the swordfish stock. Sport fishers objected because they were convinced that the bycatch of marlin would deplete that stock and virtually eliminate the sport fishery. Conservation groups objected because they believed the gear to be indiscriminate and wasteful (Bedford 1983). The Commission decided not to authorize the use of drift gillnets to catch swordfish.

Subsequent to the Commission's decision, fishers appealed to the California Legislature, and legislation was enacted in 1980 that established a non-transferable, limited entry permit system, required logbooks and observers, and imposed gear restrictions. One hundred sixty five permits were issued to fishers who landed at least one thresher or mako shark with a drift gillnet in 1978 or 1979; or who had made a significant investment in the fishery prior to May 20, 1980 (PFMC 1981). Additionally, the California Department of Fish & Game (CDFG) was directed to study the effects of the fishery on swordfish and marlin, and to report its findings to the Legislature. Pending this report, to address objections by harpoon fishers, provisions were enacted that closed the drift gillnet fishery if the catch of swordfish exceeded 25% by number of what was caught in the harpoon fishery for any given month. To address objections by sport fishers, provisions were enacted that closed the drift gillnet fishery if the bycatch of marlin exceeded 10% by number of what was caught in the sport fishery for any given month. The swordfish fishery was closed once when this quota was exceeded. The marlin quota was never exceeded.

Drift gillnets capture by entanglement. Typically, besides an appropriate vessel, drift gillnet gear required for this fishery includes a net, 45 to 60 large inflatable ball buoys, a spar buoy called a "high flyer" affixed with a radar reflector and strobe light, a deck mounted hydraulically powered reel on which to store the net, and a reel mounted level wind to assist in deploying, and retrieving the net. A large net guard of one of two basic styles, either resembling a catchers mitt or resembling a football helmet's face guard, is affixed to the stern of the vessel and lowered into the water during retrieval to keep the net from becoming entangled in the propeller. A stern roller reduces net wear. A finished, ready to fish net is not an off-the-shelf item that can be purchased. Each net is custom made from component parts that are often purchased separately from different suppliers. The basic components are the webbing, a small diameter lead-cored braided line (leadline), a large diameter braided or three-strand buoyant line (floatline), small diameter braided hollow-core poly line (buoyline), and a large quantity of seizing twine to attach it all together. Nets are most commonly constructed with one size of twisted nylon strand meshes that typically measure 18 to 20 inches between opposing knots when the mesh is stretched together. The curtain of webbing, comprised of these meshes, that makes up the net ranges from 80 to 160 meshes deep (90 to 170 ft), and from 4,800 ft long to the legal maximum of 6,000 ft finished length. Webbing is hung loosely, much like a drapery, between the floatline at the top, and the leadline at the bottom. The looseness, or "slack," gives the net its entanglement properties and is built into the net by adjusting the amount of net captured with the hangings that attach the top of the webbing to the floatline so that the finished length of the net is about 40 to 50% less than the total length of webbing used if it were stretched out. A fisher chooses the depth/length combination for his net based on the size reel that it would require, and the amount of vessel stability sacrificed by carrying the weight of reel and a wet net. When fished, the net hangs vertically in the water column between the buoyant floatline at the top of the net and the weighted leadline at the bottom. The net is suspended below the sea surface by the ball buoys to a depth equal to the length of the buoylines. This depth has historically ranged from 18 ft to as much as 90 ft, but is currently limited by regulations enacted under the Marine Mammal Protection Act (MMPA) to a minimum depth of 36 ft.

Drift gillnet trips range from one night to one month, but typically last 5 to 15 days. Fish availability, market price, weather conditions, phase of the moon, vessel fishing range, and fish-cooling capabilities dictate the timing, and length of fishing trips. Crew size is typically two or three persons, including the captain. About sunset, the net is usually deployed starting at the upwind position of the set. The high flyer is attached to the end of the net and both are lowered into the water. The vessel proceeds slowly in a downwind direction reeling off net as it goes. As a series of buoylines that are attached to the floatline about 100 ft apart unwind from the reel, a ball buoy is attached to the buoyline and thrown overboard. At the end of the set, the vessel stops, and drifts with the net attached throughout the night. Before sunrise, retrieval usually begins. The

vessel is pulled stern first into the wind and seas as the net is rewound on the hydraulically powered reel. Ball buoys are disconnected from the buoylines and stored for use on subsequent sets as they come up, and the catch is removed, dressed, and stored in the fish hold. Fish-cooling capabilities vary widely from none to ice, spray brine, or blast refrigeration.

Fishers locate where to fish by looking for temperature fronts between cooler and warmer water masses, or turbidity fronts between green and blue water masses. Using prearranged high frequency radio channels, drift gillnet fishers often communicate in coded messages with other members of loosely organized "code-groups." They share information about the amounts of catch, location, and identify other boats seen in the area or along the way. When catch rates are low, code-group members often spread out in search of fish and keep each other informed. Often, fishing vessels move rapidly from one area to another based on information from their code-group. Because of competition for fish and code-group loyalty, airplanes have been hired to fly over the fishing grounds and observe where other code-groups were fishing, and get some idea of their catch rates. Pilots would sometimes throttle back their engines and glide over a fishing boat in hopes of covertly gaining information. To counter this spy tactic, fishers sometimes covered their catch with tarps or created fake fish by leaving a fish head protruding from under a tarp (Hanan et al. 1993). However, in recent years, the accessibility of high-resolution satellite generated sea surface temperature data has greatly reduced the importance of code-group communications for locating the temperature fronts where swordfish are typically found.

California's drift gillnet permits are issued to individual fishers rather than to vessels. This practice separates the value of the permit from the value of the vessel, keeps the value of vessels from becoming inflated and allows permit holders to buy new vessels as needed. Permit holders are required to be onboard during fishing operations, and fishers are required to declare the fishing vessel being used. In 1982, most of the drift gillnet fishing vessels were small sized wood or fiberglass boats not well suited to fishing in the more extreme northern or offshore weather. Consequently, fishing effort was concentrated south of Point Conception in the same general area as where the harpoon fishery occurred.

After gathering logbook and observer data from 1980 through 1982, the CDFG reported to the California Legislature that fish bycatch in the drift gillnet fishery was not excessive, that swordfish or marlin stock depletion was not probable, and recommended that the catch of swordfish by drift gillnets be authorized. CDFG also recommended that time/area closures be established to mitigate interactions with marine mammals, and the number of permits be limited until a determination could be made concerning the capacity of shark stocks to sustain harvest without risk of depletion (Bedford 1983). Consequently, 1982 amendments repealed the 25% swordfish quota, and the 10% marlin quota.

Notwithstanding that the new regulations placed a cap of 150 permits on the fishery, about 200 had been issued after 1982 regulations established a category for new entrants who could demonstrate landings of at least 5,000 pounds of swordfish by any gear in each of the years 1977 through 1981 (Bedford 1983). Also, for the first time in this fishery, 1982 amendments established a season closure from February 1 through April 30, and established time/area closures around various of the Channel Islands to protect pinnipeds, and off mainland portions of Southern California to mitigate conflicts with harpoon and sport fishers.

The northward movement of thresher shark in spring, combined with restrictions imposed on the California drift gillnet fishery, prompted the interest of many California based fishers in a drift gillnet fishery in Washington and Oregon waters. Washington and Oregon issued annual state experimental drift gillnet permits starting in 1983. There was limited effort and landings in this fishery through 1985, but in 1986, 37 vessels landed a total of 293 mt dressed weight of thresher shark into Washington and Oregon ports. In 1987, 29 vessels landed a total of 111 mt dressed weight (Stick and Hreha 1988), and in 1988, 6 vessels landed a total of 50 mt dressed weight (Stick and Hreha 1989). Meanwhile, in California, a new and separate experimental drift gillnet limited entry system was established in 1984 and issued 35 permits limited to the area north of Point Arguello. As a probable result, the fishery began to expand northward. By 1985, the total of the combined California permits reached about 265, and the fleet was fishing as far north as Cape Mendocino. By the end of 1986, the total number of combined permits had topped out at about 300, and as larger vessels entered the fishery it moved offshore and northward to the more distant seamounts and to the edge of the continental shelf (Hanan et al. 1993).

The National Marine Fisheries Service (NMFS) awarded the Pacific States Marine Fisheries Commission (PSMFC) a contract in 1988 to study the Washington/Oregon thresher shark fishery and draft a coastwide management plan for the species to determine the viability of a coastwide drift gillnet fishery that would not jeopardize the resource (Stick and Hreha 1989). California had previously determined that restrictions were needed to reduce fishing pressure on thresher sharks. In 1985, fishing within 75 miles of the California coastline from June 1 through August 14 was prohibited to reduce fishing pressure on thresher shark. This restriction was changed to the period May 1 through July 14 in 1989, and changed again in 1992 to the current closure period of May 1 through August 14. Meanwhile, in 1989, Washington and Oregon closed the experimental drift gillnet thresher shark fishery due to concern over the observed incidental catch of marine mammals and sea turtles. The PSMFC finalized its coastwide thresher shark management plan in 1990. The Plan proposed an annual coastwide thresher shark harvest guideline of 340 mt dressed weight and discouraged catches of juvenile sharks. No quotas were established but states agreed to this guideline. The plan also recognized that thresher shark fishery restrictions in place in California, and the closure of the Washington/Oregon fishery assisted stock rebuilding, and noted that, given the low reproductive and growth rates of thresher shark, increases in abundance may not be evident for five to ten years. The plan called for the establishment of a management panel comprised of representatives from California, Oregon and Washington to monitor the resource and fishery, and meet annually to make management recommendations (Stick et al. 1990). No management recommendations came from the annual meetings. Although the plan has not been officially terminated, it has been inactive since about 1998.

Prior to 1995, it was illegal to land drift gillnet caught swordfish into Oregon. Although swordfish had been caught off Oregon for many years, they were landed in California or Washington ports. Oregon instituted a drift gillnet developmental fishery permit in 1995 allowing the landing of drift gillnet caught swordfish, and issues up to 10 permits annually. Permit stipulations restrict harvest from within 75 miles of the shore from May through August 14 to protect thresher sharks and in depths less than 1,000 fm the remainder of the year. Since 1995, annual swordfish landings between 2.5 to 35.3 mt have been made by 2 to 6 vessels (J. McCrae, Oregon Department of Fish and Wildlife, pers. comm.). The direct targeting of thresher sharks with drift gillnet is prohibited, however thresher shark caught incidental to swordfish fishing may be landed at a ratio of one shark per every two swordfish. Tables A-40 and A-41 report landings and exvessel revenues from the drift gillnet fishery landing in Oregon.

In 1994, for the first time, new California amendments eliminated any provision for allowing new entrants into the fishery, except by permit transfer. In 1998, the two previously separate permits were combined into one, and by 1999, due to the elimination of existing permits when not annually renewed, 139 valid drift gillnet limited entry shark/swordfish permits remain. Regardless of the number of permits in existence at any time, during and among fishing seasons, fishing effort varied from season to season and peaked in the 1986-87 season with over 11,000 sets, quickly declined to about 4,500 sets by 1990 (Hanan et al. 1993), and has averaged about 3,500 sets per year through 1998 (Enriquez 2000: In a NMFS working paper: Observed Catch of HMS in the California/Oregon Drift Gillnet Fishery).

The California drift gillnet fishery now operates primarily outside of state waters to about 150 miles offshore, ranging from the U.S Mexico border in the south to northward of the Columbia River depending on sea temperature conditions. Because of seasonal fishing restrictions, and the seasonal migratory pattern of swordfish, about 90% of the annual fishing effort occurs between August 15 and December 31. Depending on where they fish, drift gillnet vessels primarily land fish in San Diego, San Pedro, Ventura, Morro Bay, Monterey, Moss Landing, and San Francisco Bay area ports where it is sold in the fresh fish market providing

high quality, locally-caught fish for the restaurant trade. Tables A-42 and A-43 report landings and ex-vessel revenues for the drift gillnet fishery landing in California³.

Since 1994, swordfish landings have ranged between almost 600 mt and almost 900 mt and thresher shark landings have ranged between 200 and 400 mt. Relatively high valued landings of all species harvested in this fishery have averaged about 1,500 mt since 1994 (Tables A-44 and A-45). The ex-vessel value of the fishery in constant \$1999 ranged between almost \$3.5 million to more than \$6 million during this time period. Swordfish provided the largest share of total ex-vessel revenue, ranging from \$2.7 million to almost \$5 million over 1994-1999.

The two other species of thresher sharks caught in this fishery are bigeye thresher and pelagic thresher. Shortfin mako constitutes an important incidental catch. They are not so abundant as to attract directed effort, but their market quality and ex-vessel value are good (Holts 1988). Blue sharks are rarely landed or marketed.

The incidental catch of non-target species in the drift gillnet fishery varies by year, but some of the predictable and saleable species include albacore and bluefin tunas, Pacific bonito (*Sarda chiliensis*), opah (*Lampris guttatus*), and louvar (*Luvarus imperialis*).

Bycatch in the drift gillnet fishery is mainly comprised of ocean sunfish (*Mola mola*) and blue shark. In the period 1990-1998, ocean sunfish amounted to 26.1% of the total observed catch of which 80.6% were returned alive, and blue shark amounted to 15.2% of the total observed catch of which 14.5% were returned alive (Holts and Rasmussen 1999).

To protect gray whales, in 1985, California adopted a closure within 25 miles of the mainland coastline from December 15 through the season's end on January 31. Due to marine mammal interactions, the drift gillnet fishery is listed as a Category I fishery under the MMPA, and required the formation of the Pacific Offshore Cetacean Take Reduction Team in 1996 to develop a Take Reduction Plan (TRP) for the drift gillnet fishery aimed at reducing the level of marine mammal interactions to specified levels. In 1997, regulations implementing the TRP required all drift gillnet fishers to attach a number of acoustic "pingers" to the top and bottom of the net, lower the top of the net to a minimum of 36 ft below the sea surface, and attend annual "skipper workshops" to facilitate the exchange of information with NMFS regarding marine mammal interactions in the fishery.

NMFS conducted an Endangered Species Act (ESA) required section 7 consultation to examine the impacts of issuing an MMPA permit authorizing the take of ESA listed marine mammals in the drift net fishery, and found that the operation of the drift gillnet fishery would likely jeopardize the continued existence of the leatherback and loggerhead sea turtles. The reasonable and prudent measures NMFS developed to mitigate that jeopardy calls for the imposition of additional time/area closures. Beginning August 15, 2001, the area between Point Conception and 45° N latitude will be closed to drift gillnet fishing through October 31 to reduce leatherback sea turtle impacts. If an El Niño condition is predicted to occur, or is occurring, the area south of Point Conception will be closed to drift gillnet fishing from August 15 to August 31, and during the entire month of January to reduce loggerhead sea turtle impacts.

³ Drift gillnet landings reported in Table A-42 are for California drift gillnet gear (CA-65). It is speculated that significant amounts of California drift gillnet swordfish landings prior to 1994 were assigned to California unknown gear (CA-0), and California entangling net gear (CA-60). This is somewhat verified by comparing pre-1994 total West Coast swordfish landings for all gears (Table A-1) with swordfish landings reported for HMS gears, the difference likely being largely attributable to landings by drift gillnet gear that was miss-assigned to California unknown or entangling net gear.

A.2.4.2 Harpoon

The harpoon fishery targets swordfish, although small quantities of shark are also landed by harpoon gear, most often common thresher and shortfin mako (Tables A-46 and A-47). There have been infrequent reports of blue, hammerhead (*Sphyrna spp*), soupfin (*Galeorhinus zyopterus*), and white (*Carcharodon carcharias*) sharks being recorded as taken with harpoon gear⁴. Swordfish landings and exvessel revenues peaked in 1978 at 1,172 mt, decreased to a record low of 16 mt in 1991, before rising over tenfold in 1993-94 and finally settling to around 80 mt over 1996-1999. Landings were typically less than 200 mt in most years. Sizes average 149 cm in length (cleithrum to fork in tail) or 85 kg dressed weight in 1981 to 1993.

The harpoon fishery for swordfish in California dates back 3,000 years when Native Americans fished with stone and wooden harpoons from driftwood canoes. The modern harpoon fishery off California began in the early 1900s, was the primary gear for swordfish from the early 1900s to the 1980s, and declined in 1980, when drift gillnet fishing started. Many vessels converted to drift gillnet fishing gear or obtained permits to use both types of gear. Today, only a handful of vessels continues to participate in the harpoon fishery.

Harpoon vessels are from 6 m to 26 m (20-87 ft) in length with a 6 m to 8 m bow plank and hold capacities up to 100 mt (Coan et al. 1998). When a fish is spotted, the plank is positioned above the swordfish and the harpoon thrown from the end of the plank. The fish is stored over ice for the rest of the trip. The hand-held harpoon consists of a 10-16 foot metal and/or wood pole attached to a 2-foot long metal shank and tipped with a 4-inch tethered bronze or iron dart. The harpoon is thrown at a surface-basking fish by a person standing on a metal pulpit at the end of a long plank at the vessel's bow (Coan et al. 1998). After harpooning, the handle is pulled free from the dart, and the mainline, marker flag, and floats are thrown overboard, leaving the fish to tire itself. The vessel then proceeds to search for and/or harpoon other fish. After the fish is tired, in approximately two hours, the vessel returns to retrieve it.

The harpoon fishing season typically begins in May, peaks in July to September, and ends in December, coincident with the annual northwesterly movement of the North Equatorial Countercurrent and during months of calm sea conditions that harpoon fishing generally requires. Fishing usually concentrates in the Southern California Bight (SCB) off San Diego early in the season and shifts to areas as far north as Oregon later in the season, especially in El Niño years. Swordfish are usually sighted basking at the surface of the water in temperatures between 12° to 26°C. In El Niño years, the range of water temperatures where the majority of swordfish sightings occur narrows and favors warmer temperatures between 20° and 22°C. Harpoon is legal gear in California and Oregon, but is not defined as legal gear in Washington.

Harpoon vessels work in conjunction with an airplane to spot swordfish basking at the surface beyond binocular range from a vessel or sub-surface swordfish. Spotter planes were introduced in the early 1970s. Spotter planes were banned by California Department of Fish and Game (CDFG) for one year during 1976. In 1984, spotter airplanes were allowed full-time in the fishery.

Confinement of the fishery to a relatively small area, principally the calm waters of the SCB, leaves it vulnerable to changing environmental conditions and competition from other gears. Environmental effects during El Niño events lead to decreased catches and CPUE. Competition from the drift gillnet fishery since 1980 has also led to decreased harpoon catches. Prices received for harpoon-caught swordfish generally exceed those from drift gillnet-caught swordfish, since the harpoon-caught swordfish do not spend the time in the net that the drift gillnet-caught swordfish do, and thereby generally allowing a fresher product. The harpoon season tends to taper off when the drift gillnet season begins because the substantial increase in swordfish volume lowers the ex-vessel swordfish price for harpoon-caught swordfish. The effects (if any) from recent increases in offshore longline fisheries are not yet seen.

⁴ Shark catches by harpoon gear are highly suspect according to industry and Coan et al. (1998).

A.2.5 High Seas Longline Fishery

The first U.S. longlining for billfish and tunas in the eastern Pacific was conducted on a non-commercial basis by the Pacific Oceanic Fishery Investigations (POFI) of the U.S. Fish and Wildlife Service. In 1952 and 1954, 18 longline sets were made from POFI vessels (Royce 1957). Similar experimental fishing was conducted by the CDFG (Wilson and Shimada, 1955). In 1954 and 1955, in connection with underwater nuclear tests conducted on the high seas southwest of California, four longline cruises were undertaken by the U.S. Atomic Energy Commission. These operations produced unspecified catches of billfish (Shimada 1962). In 1968 and 1969, the Bureau of Commercial Fisheries of the U.S. Fish and Wildlife Service conducted a series of experimental longline cruises off of Baja and Southern California to explore the viability of an alternative method for harvesting swordfish (Kato 1968, Kato 1969). The primary mission of these cruises was to see how longline fishing, a successful method on the east coast but not used by California fishers, compared with the traditional harpoon method. The results indicated that the catch rate using longline gear was high enough to support a fishery during the late fall and winter (Kato 1969). The Scripps Institute of Oceanography also conducted experimental longline fishing for tunas and billfish off Baja in 1970 (Blackburn et al. 1970).

The first major commercial longline fishery in the eastern Pacific started in 1956, and expanded rapidly, when Japanese longline vessels targeting billfish began operating east of 130° W longitude. In the mid 1960s, vessels from Korea and Taiwan also began longline operations in the eastern Pacific (Joseph et al. 1973).

Even though pelagic longline gear has been used in Hawaii since 1918, the U.S. did not participate in the Pacific longline fishery for billfish and tunas in a substantial way until the 1990s. Prior to the 1970s, pelagic longline was used to target yellowfin tuna by a small number of local vessels fishing in the waters surrounding the main Hawaiian Islands. During the 1970s, Hawaiian longline fishers began to set gear deeper to catch more valuable bigeye tuna. This fishery adopted new monofilament gear in the late 1980s, replacing older-style rope “basket” gear with a more flexible system of line throwers and snap-on branch lines and floatlines that allowed much greater flexibility in fishing depth. This flexibility contributed to the development of the swordfish longline fishery (WPFMC 1994).

In the 1950s, local Hawaiian longline vessels rarely fished more than about 20 nm from shore. During the 1960s, a higher CPUE prompted a growing number of vessels to extend their range 100 to 400 nm south of Oahu. In the late 1980s, east coast vessels began joining the Hawaiian longline fishery after leaving Atlantic and Gulf of Mexico tuna and swordfish longline fisheries. Longline techniques used to target swordfish were introduced to Hawaii by this east coast group and established Hawaii as a major producer of swordfish (Coan et al. 1999). The expanded fishery became the largest in the state in terms of landings and revenue. With the advent of the swordfish longline fishery, a segment of the fishery began to routinely make trips beyond the EEZ to swordfish grounds 400 to 1,000 nm away. In 1991, there were approximately 23 vessels, about 16% of the longline fleet, in this distant water fishery that targeted swordfish year-round. In 1992, 66 vessels targeted swordfish sometime during the year, while 27 vessels fished for swordfish full-time. Trips targeting swordfish accounted for 23% of the total number of longline trips taken in 1992 (WPFMC 1994). Hawaiian swordfish longliners average 30-40 days at sea per trip and fish up to 1,500 miles from Hawaii, compared to tuna longliners that average 7-10 days per trip and fish closer to the islands (Dollar 1992).

The Western Pacific Fishery Management Council developed and implemented the Fishery Management Plan for Pelagic Fisheries of the Western Pacific Region in 1987 (52 FR 5983). The FMP prohibited foreign longline vessels from fishing within certain areas of the EEZs of Hawaii, and Guam. In response to the rapid influx of east coast longliners in the late 1980s, Amendment 4 to this FMP extended previous emergency interim rules (56 FR 14866; 56 FR 28116) that were implemented to arrest the rapid growth of the longline fishery. This 1991 amendment (56 FR 51849) established a moratorium on new participants from entering the Hawaiian longline fishery. Under this regulation, a longline vessel fishing in the Hawaii EEZ, or using the EEZ with pelagic species onboard, or landing pelagic fish in Hawaii, must have a limited entry permit. In 1994,

Amendment 7 to this FMP replaced the moratorium with a limited entry program for the Hawaiian longline fishery (59 FR 26979) limiting the fishery to 167 vessels.

Under California law, longline fishing in the EEZ off California is prohibited. However, California registered vessels are allowed to land longline caught fish in California ports as long as fishing takes place outside of the EEZ. In 1991, there were three longline vessels that fished beyond the EEZ targeting swordfish and bigeye tuna and unloaded their catch and re-provisioned in California ports. In 1993, a Gulf coast fish processor set up an infrastructure at Ventura Harbor, California to provide longline vessels with ice, gear, bait, and fuel, and fish offloading and transportation services (Vojkovich and Barsky 1998). Consequently, longline vessels seeking an alternative to the Gulf of Mexico longline fishery, and precluded from entering the Hawaii fishery, began arriving in Southern California. By 1994, 31 vessels comprised this California based fishery, fishing beyond the EEZ, and landing swordfish and tunas into California ports. These vessels fished side-by-side with Hawaiian vessels in the area around 135° W longitude in the months from September through January.

Other marketable species in the longline catch include opah (*Lampris regius*), dolphin (*Coryphaena hippurus*), and escolar (*Lepidocybium flavobrunneum*). Relatively few sharks, in proportion to those caught, have been marketed from this fishery. The major shark bycatch is blue shark, which is discarded. Other bycatch includes striped marlin, turtles, birds, and marine mammals.

West coast swordfish landings by California-based longline vessels have ranged from 28 mt in 1991 to 497 mt in 1994 (Table A-48), with swordfish accounting for 78%, tunas 9% and sharks 6% of total longline landings in 1994 (Table A-49). From 1991 through 1994, swordfish landings by California-based longline vessels grew from 3 to 29% of total West Coast swordfish landings (Tables A-48 and A-1). In 1994, total West Coast longline landings were more than five times those in 1993 (636 mt). The overall trend for West Coast longline landings from 1991 is decidedly increasing, ranging from a 1991 low of 56 mt to the 1999 high of 1,524 mt, with longline-caught swordfish increasing from 27 mt to 1,287 mt (Table A-50). There is a developmental pelagic longline fishery authorized off Oregon, but it has produced negligible landings (Table A-51). California receives virtually all of the high seas longline catch (Table A-52). In 1994, West Coast swordfish landings by California-based longline vessels represented 35% of total swordfish exvessel revenues, by 1999 this share had risen to 56% (Tables A-53, A-54, A-55 and A-2)

By 1995, only six longline vessels made a high seas trip from a California port, although 22 vessels made at least one longline landing (Vojkovich and Barsky 1998). The group of vessels that came to California from the Gulf of Mexico in 1993 and 1994 left the California based fishery and either returned to the Gulf of Mexico fishery, or acquired Hawaiian longline permits in order to have fishery options for the months from February to September, when fishing within range of California ports drops off substantially. Many of the vessels that had participated in the California fishery had discovered productive swordfish fishing grounds in the fall and winter that were further east than the Hawaiian fleet usually operated. As the California fleet migrated to Hawaii, these vessels continued to move east later in the year, and operated out of California ports when it became closer than returning to Hawaii. These vessels fished from California until about January, when the pattern of fishing moved to the west, and operating from Hawaii became more convenient. Consequently, beginning in the latter part of 1995, a number of vessels from the Hawaiian fleet began a pattern of fishing operations that moved to California in the fall and winter and then back to Hawaii in the spring and summer.

Longline fishing gear consists of a main line strung horizontally across 1-100 km (< 1-62 mi) of ocean, supported at regular intervals by vertical float lines connected to surface floats. Descending from the main line are branch lines, each ending in a single, baited hook. The main line droops in a curve from one float line to the next and bears some number (A-25) of branch lines between floats. Fishing depth is determined by the length of the floatlines and branchlines, and the amount of sag in the main line between floats (Boggs and Ito 1993). The depth of hooks affects their efficiency at catching different species (Hanamoto 1976, 1987; Suzuki et al. 1977; Boggs 1992). When targeting swordfish, vessels typically fish 24 to 72 km (15-45 mi) of 600 to 1,200 pound test monofilament mainline per set. Mainlines are rigged with 22 m branch lines at approximately

61 m intervals and buoyed every 1.6 km (1 mi). Between 800 and 1,300 hooks are deployed per set. Large squid (*Illex spp.*) are known to be used for bait; various colored light sticks are also used. The mainline is deployed in 4 to 7 hr and left to drift (unattached) for 7 to 10 hr. Radio beacons are attached to the gear for recovery. Retrieval requires 7 to 10 hr. Fishing occurs primarily during the night when more swordfish are available in surface waters. Generally, longline gear targeting tuna is set in the morning at depths below 100 m, and hauled in the evening. Longline gear targeting swordfish is set at sunset at depths less than 100 m, and hauled at sunrise. A typical longliner carries a crew of six, including the captain, although some of the smaller vessels operate with a four-man crew. Fishing trips last around 3 weeks. Most vessels do not have built-in refrigeration equipment, limiting their trip length. The fish are iced and sold as “fresh”.

Longline-caught fish are sold to wholesale fish dealers. Local California fisheries, distant offshore fisheries, and imports from Hawaii, Chile, and Taiwan all influence the ex-vessel price paid to local longliners for swordfish. Swordfish are often graded by size and quality and the price adjusted accordingly.

At present, management authority rests with the State of California. Current fishery regulations include only basic commercial fishing license requirements and prohibited species (striped marlin) provisions. The High Seas Compliance Act, passed to implement the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas and adopted by the United Nations in 1993, requires logbooks for U.S. vessels fishing beyond the EEZ.

In August 2000, as the result of the case *Center for Marine Conservation vs. NMFS*, a federal district court issued an order directing the NMFS to complete an Environmental Impact Statement (EIS) to assess the environmental impacts of fishing activities conducted under the Fishery Management Plan for Pelagic Fisheries of the Western Pacific Region by April 1, 2001, and ordered restrictions and closures over millions of square miles of the Hawaiian longline fishery’s usual and accustomed fishing grounds. These court ordered closures effectively eliminated the swordfish fishery. As a result, some Hawaiian longline permit holders de-registered their vessels from the permit, and proceeded to fish from California ports, as was their custom during this time of year.

NMFS completed the EIS in March, 2001, and, consistent with a Biological Opinion that was issued at the same time, NMFS found it necessary to implement measures for the protection of endangered and threatened sea turtles. Such measures included a prohibition against targeting swordfish north of the equator by Hawaiian longline vessels, and prohibits longline fishing by Hawaiian longline vessels in waters south of the Hawaiian Islands from 15° N latitude to the equator, and from 145° W longitude to 180° longitude during the months of April and May. This decision is being challenged in a lawsuit filed by the Hawaiian Longline Association. As of July 2001, about 20 Hawaiian longline vessels sit idle in San Pedro Harbor.

Oregon does allow the harvest of swordfish and blue shark within the EEZ under a developmental fishery permit; however, no landings have occurred under the permits. Up to 10 permits are allowed for blue shark and 20 for swordfish. Since 1995, the number of blue shark permits issued in a year has ranged from none to six and the number of swordfish permits issued has ranged from one to nine. Permit stipulations restrict the harvest from within 25 miles of the shore.

A.2.6 Other Fisheries

Gillnet fishers reported that during the late 1990s, vessels using small-mesh (3.5-8.5 inches stretched mesh) drift gillnets started fishing for albacore and bluefin tuna off southern and central California. While the large-mesh drift gillnet fishery is well documented through logbooks and NMFS at-sea marine mammal observer program, little is known about the directed take of highly migratory species in the small-mesh fishery. Data that are available from CDFG logbooks show the fishery consisted of four vessels in 2001 and two vessels in 2000. Fishermen claim there may be as many as 8-10 vessels that occasionally use small-mesh drift gillnets when albacore and bluefin tuna are available. PacFIN data indicates there could be as many as 20 vessels which might have fished small-mesh drift gillnets based on landing receipts for drift gillnet vessels landing albacore and bluefin tuna, but not swordfish. Under California law it is illegal to take swordfish with stretched mesh less than 14 inches so an absence of swordfish landings by vessels using drift gillnet gear was used to screen potential small-mesh fishing operations.

Currently, California vessels that participate in the small-mesh drift gillnet fishery need a General Gill/Trammel Net Permit and must also fill out gillnet logs for each day they fish. Off the central California coast there are several nearshore closures to protect seabirds and marine mammals, however none extends into the EEZ. There are no restrictions on the length of net that may be set, although past observations on small-mesh gillnet fisheries shows vessels generally set no more than 800 fathoms of net. Generally, the cork line is at the surface and the lead line may extend as deep as 6 fathoms. The four vessels that submitted logs reported using stretched mesh between 6 and 7 inches. Studies by NMFS in the 1970's indicate that the maximum take of smaller fish (1A-15 pounds) occurs when 7.5 inch mesh is used (Bartoo, NMFS, La Jolla, pers. comm.). Owing to similar body shape, the bluefin and yellowfin tuna taken by these nets are probably the same size. Field observations by CDFG wardens of small-mesh drift gillnet vessels landing albacore reported similar results with the fish reported in the 10-14 pound size range. This is the same general size albacore troll boats land, vessels that are fishing in the same area as the DGN vessels.

The four vessels that were documented as using small-mesh drift gillnets landed between 1.0 and 15.0 mt of albacore and 0.0 to 3.0 mt of bluefin tuna during the 2001 season (Table A.56). These landings accounted for between 20% and 48% of gross receipts. To the north, these vessels fished between Point Conception and Point Sur and seaward as far as 50 nm offshore. In southern California, they fished seaward of La Jolla and in the vicinity of Cortez Bank. All the effort took place between July and October. None of the vessels reported making sets in the turtle closure area off central California during the closure August 15 through October 31.

Swordfish are also taken by a growing Mexican fleet of approximately 50 vessels converted from drift gillnet to longline gear. Mexican drift gillnet vessels first deployed drift gillnets in 1985. The number of vessels increased to 31 by 1993. As in the U.S. drift gillnet fishery, these vessels target the more valuable swordfish and land pelagic sharks as a profitable bycatch. The vessels and gear in this fleet are similar to the California-based drift gillnet fleet, except that in Mexico nets may be 4.8 km in length.

A.2.7 Processing, Products, and Imports

In California, there were 90 seafood processors in 1995. Of these, five processed over 45,360 kg of swordfish. Processors receive, process, and sell the fish wholesale. As with processors on the east coast, they receive mostly fresh, dressed swordfish. However, unlike the east coast, there is a greater demand for fish weighing over 45 kg dressed weight (approximately 60 kg whole weight), called marker fish, than for fish under 45 kg, called pups. Processors usually cut the swordfish into loins, but there is a growing trend of cutting the swordfish into 198-to-227 gm steaks, called portion control. Pacific processors distribute equally across the U.S. They also import fresh and frozen swordfish when the U.S. fisheries are closed. Most California swordfish is sold to local markets. U.S. imports of swordfish are shown in Table A-57. From 1971 to 1975, virtually no swordfish were imported due to the mercury restriction of 0.5 ppm.

A.2.8 Recreational Fishing

Recreational fishing for large, migratory pelagic species began off southern California and Baja California, Mexico in the late 1800s. This fishery now operates year round with peaks in activity for tuna, billfish and pelagic sharks during the spring and summer and lasting into the fall. The fleet is composed of privately owned vessels, as well as charter vessels, party boats, and head boats, collectively called commercial passenger fishing vessels (CPFV). The HMS recreational fisheries off the Washington and Oregon coasts are solely for albacore tuna using hook-and-line gear. A recreational fishing license is not required to fish for albacore tuna in Washington but is required in Oregon. The Washington and Oregon recreational fishery is open year-round and there is no minimum size limit. In Washington, there is no catch or possession limit. In Oregon, albacore tuna come under the catch limit of 25 miscellaneous fish.

Biological and socioeconomic data for HMS recreational fisheries pale in comparison to those for HMS commercial fisheries. State administered logbook programs are an important source of recreational fishing catch and effort data for CPFV patrons, including those participating on long-range trips aboard California based CPFVs into Mexican waters (Table A-58). The National Marine Fisheries Service conducts the Marine Recreational Fishing Statistical Survey (MRFSS) which routinely collects recreational catch and effort data

from West Coast marine anglers, including those targeting HMS from CPFVs and privately owned vessels, as well as occasional add-on surveys to collect angler socioeconomic data (Table A-59). The data available from MRFSS and the state recreational fishery monitoring programs are provided to the coastwide recreational fishery network data system (RecFIN) where they are integrated into a comprehensive coastwide marine recreational fishery data base. Recreational billfish fishery data are also collected by the Southwest Fisheries Science Center (SWFSC) through its Billfish Angler Survey and the Billfish Tagging Programs. The data from these programs are published annually in the Billfish Newsletter (Holts and Prescott 2001).

West coast recreational fishing activity directed towards large, migratory pelagic species emanates mainly from CPFVs and privately owned vessels departing sportfish landings, marinas and launch ramps dotting the southern California coast from LA to San Diego. The Sportfishing Association of California (SAC) is the major industry organization representing nearly 200 CPFVs operating out of 23 landings from Morro Bay to San Diego. This fleet carries almost 1 million passengers annually to local and Mexican fishing grounds. The fleet and supporting shoreside facilities represent a monetary investment totaling close to \$80 million, and a labor force of about 4,000 persons. In 2000, there were an estimated 876,000 trips taken aboard southern California based CPFVs resulting in a total catch of 2,941,000 fish, a 44% and 30% increase respectively from 1999 (RecFIN). Approximately 429,000, 49%, of all southern California based CPFV trips in 2000 accounted for total HMS catches of 99,000 fish, 3% of the total CPFV catch. This is 12 times the number of trips, and a 21% increase in HMS catch compared to 1999.

A large number of southern California based privately owned vessels are used to recreationally fish for HMS, upwards of 6,000 annually. These vessels cover a wide range of sizes and types, ranging in length from 17 ft skiffs to 90 ft or greater luxury yachts, with many vessels under 30 ft. In 2000, private vessels made approximately 1,760,000 fishing trips, of which 1,318,000, 75%, resulted in HMS catches. This was an increase of 51% and 100% in total trips and HMS trips from 1999 (RecFIN). The estimated total recreational catch of southern California based private vessels in 2000 was 2,594,000 fish of which 57,000, 2%, were HMS (RecFIN), up 37% and 150% respectively from 1999. Southern California based private vessels accounted for 75% of the total (CPFV plus private vessel) number of HMS trips, and 37% of total HMS catches in 2000, a decrease of 21% and an increase of 68% respectively from 1999.

Information from an add-on expenditure survey to the MRFSS in 2000 (Gentner et al. 2001) indicates that across all species, and the entire West Coast, expenditures by participants -- CPFV, private vessel and shore -- on marine recreational fishing was estimated at \$4.5 billion in 2000. Southern California anglers (residents and non-residents) accounted for the largest share, 38%, followed by Washington anglers, 31%, northern California anglers, 17%, and Oregon anglers 14%. Estimates of southern California CPFV and private vessel trip expenditures totaled \$205 million in 2000, 62% CPFV and 38% private vessel. Based on the proportions of HMS trips of total recreational trips for CPFV and private vessels, HMS trip expenditures for CPFVs were \$62 million and HMS trip expenditures for private vessels were \$58 million in 2000. In addition to trip expenditures, southern California residents spent \$1.5 billion on fishing equipment (e.g. vessels and tackle) and other semi-durable (e.g. maintenance) and durable (e.g. vacation home) items used primarily for marine recreational fishing.

A.2.8.1 Charter/Party Boat Fleet

The tropical tunas, billfish and sharks become available off the West Coast as they move seasonally eastward from oceanic waters and northward from Mexico. Except during periods of warm water, recreational catches of these species are almost exclusively from waters off southern California (Table A-60). Albacore move into the coastal waters along the West Coast from more temperate waters offshore. The timing and extent of the species appearance is dependent on seasonal development of environmental and oceanographic conditions such as water temperature, coastal up welling, strength of the California Current, El Niño episodes and possibly longer decadal cycles. Albacore are one of the most important species caught by the West Coast CPFV fleet (Table A-61).

The CPFV fleet offers short trips from one to two days and long-range trips of up to 15 days into Mexican waters. The fleet is made up about 300 vessels from about 8 to 40 m in length and target large pelagic species when quantities occur within their range.

The smaller and faster California sport fishers licensed to carry six passengers or less are called 6-packs. Six-pack vessels target tunas, billfish and coastal pelagic species on one or two-day trips. These vessels are more likely to spend the extra time necessary to catch billfish if requested by their clientele. The larger CPFV vessels may carry 40 or more passengers and target albacore, bluefin, yellowfin, skipjack, dorado and coastal pelagic species on long-range trips into Mexico and shorter trips of one or two days within the SCB. Few CPFV vessels with more than six passengers will take the time necessary to catch billfish or pelagic sharks because it limits fishing activity of other passengers.

In California, charter vessels are required to submit logbooks from each trip detailing the number of anglers and catch by species to Department of Fish and Game. Oregon and Washington do not require CPFV logbooks, but Washington does have a voluntary CPFV logbook. The state agencies also conduct occasional angler interviews to supplement catch and effort data.

California catches from the CPFV logbooks for HMS are shown in Table A-58 from 1980 to 1998. Fishing effort in terms of angler hours reported by CDFG is summarized for northern California, southern California and Baja California, Mexico (Figure A-2). Annual tuna catches for the CPFV fleet over the period 1990 – 1998 averaged 85,400 yellowfin, 41,000 skipjack and 11,000 bluefin tuna (Figure A-3). Of that, 87%, 66%, and 87%, respectively, were landed on vessels operating in Mexican waters. California's CPFV catch for 1998, by CDFG block number indicates highest catches in the SCB, and south of San Clemente Island for albacore, yellowfin, bluefin, bigeye, skipjack, and dorado. CPUE in catch per angler hours fished for 1998 and by block number show distinct areas of greater angler success for albacore, yellowfin, bluefin, bigeye, skipjack, and dorado. Figures A-4 through A-9 present the 1998 California charter/party fleet catch locations for albacore, yellowfin, bluefin, bigeye, skipjack, and dorado, respectively. Figures A-10 through A-15 present the 1998 California charter/party fleet catch per unit of effort for albacore, yellowfin, bluefin, bigeye, skipjack, and dorado by area, respectively.

Albacore is an important recreational species for California's charter/party fleet. Average catch was 90,000 fish annually over the 1980- 1998 period of which 80% were taken off Mexico (Table A-58). Catches off California fluctuated widely during the period, ranging from 171 to 54,500 fish annually. Strong El Niño conditions and possibly decadal shifts in oceanographic conditions have a strong influence on albacore distribution and movement patterns. Reported albacore CPUE increased in the 1980s and late 1990s when El Niño conditions were present (Figure A-16).

California CPFV vessels also conduct night fishing trips for blue and mako sharks during the spring and summer and daytime trips for thresher sharks in coastal waters when supported by adequate passengers/client interest. The CPFV data indicate catches of shortfin mako, common thresher, and blue sharks averaged 292, 90, and 2,835, respectively, between 1990 and 1998.

A specialized sector of this California fishery is the long-range and multi-day fleet that fishes extensively off Mexico. Mexico provides special permits, subject to payment of fees, certain port call requirements, and observer and reporting requirements. In 1998, an unprecedented problem occurred for the California long-range fleet when it was required to halt operations late in the calendar year off Mexico after the IATTC yellowfin purse seine quota was reached. Under IATTC's yellowfin quota system, when the quota is met, fishing ceases for both the commercial and recreational charter fleets. This resulted in the loss of the key holiday period to the U.S. charter fleet.

Mexican daily recreational catch (bag) limits are more conservative than CDFG limits. For most species, the Mexican daily bag limit is five fish, with a total daily limit of 10 fish. There are exceptions, however, and in the case of marlin, sailfish, swordfish, and shark, the limit is one, and it counts as though an angler caught five of any other species within that angler's daily 10 fish limit. The dorado limit is two, and is equivalent to five fish of any other species. When skindiving, the daily limit is five of all species combined. SCUBA diving is prohibited for taking fish in marine waters. Catch and release is encouraged. These regulations were implemented in May 1995, and may be up for revision in the near future.

The San Diego Bay long-range charter vessel fleet is comprised of approximately 57 vessels. The fleet is based at three sport fishing landings: H&M Landing, with 26 vessels; Point Loma Sport Fishing, with 13

vessels; and Fisherman's Landing, with 18 vessels (London Group 1999). The typical fishing season is March through October. During the off-season (November to February), about 15% of the vessels fish in more northerly waters and the remaining 85% remain in San Diego for repair and maintenance for the upcoming season. Approximately 544 persons are directly employed as crew members, in maintenance, dock workers, in administration, and in retail (London Group 1999). Two-thirds are full-time employees and most are employed as crew. The number of crew per vessel ranges from between three and 15 with a median of eight. Retail and administrative workers oversee the duties of booking fishing trips and running the local tackle and bait shops. During the off-season, only one or two crew members of the vessels not operating on a full-time schedule stay employed to help with the repairs and maintenance of the vessel. The other workers may find other jobs locally in San Diego but all reside in San Diego throughout the year.

A total of 154,567 fishers visited the three sportfish landings in San Diego Bay in 1998 (London Group 1999). Approximately 66,355 fished in U.S. waters and the remaining 88,212 fished the waters off of Mexico. At H&M Landing, 39,000 fished in Mexican waters and 42,356 fished in U.S. waters. At Point Loma Sportfishing, 23,246 fished in Mexican waters and 13,947 fished in Mexican waters. At Fisherman's Landing, 25,966 fished in Mexican waters and 10,052 fished in U.S. waters.

The most recent survey of the San Diego Bay charter/party sport fishing industry concluded that in 1989, only 44% of persons who fished from San Diego Bay sportfish landings actually lived in San Diego County (NMFS, Results of the Southern California Sportfish Economic Survey, 1991). The remaining 56% came to San Diego from outside of the County. The number of fishers from outside of San Diego County has now grown to 80%, with Los Angeles the largest source (London Group 1999).

The total economic activity occurring within San Diego Bay (Fisherman's Landing, Point Loma Sportfishing, and H&M Landing) in 1999 was 1,200 jobs, \$25.3 million in earnings, \$49 million in economic output making it a critically important industry to San Diego's economy (Table A-62) (London Group 1999).⁵ This type of detailed participation and expenditure data is currently lacking for other fleets and areas.

In Washington, the major port for charter vessels is Westport, which has seven charter offices with an average of fifteen charter vessels that routinely fish for albacore tuna in the summer months. The importance of albacore tuna to this fleet has risen in the last decade as other fishery opportunities (e.g. salmon and rockfish) have declined.

Based on information from charter vessel operators, the Washington recreational fishery has been fairly stable, with increases in catch in recent years. The distance from shore varies from year-to-year (in 2000, the average distance was 64 nm) and charter vessels often take two-day fishing trips for albacore. According to one charter operator, the number of anglers reserving tuna trips on his vessel nearly doubled from 1992 to 1998. The amount of tuna caught has also increased in proportion to the number of anglers, from about 1,300 in 1992 to about 3,000 in 1998.

Washington has a voluntary program for charter/party logbooks, which was instituted in 2000 with a 69% compliance rate. Based on the 2000 Washington logbook data, over 8,000 albacore were caught by over 1,300 anglers. The average number of albacore caught per person is six with an average weight of 14.5 pounds. Oregon does not have a logbook program.

It is difficult to separate the charter/party boat fishery from the private vessel recreational fishery in Oregon (see the private sport description below for additional details). Albacore sport fishing off Oregon has increased in recent years due to improvements in navigational aids and marine equipment and greater appreciation of albacore as game fish. Depending upon the availability of albacore nearshore, recreational landings have ranged from 11 mt to about 80 mt in recent years, accounting for up to 2% of the total Oregon albacore harvest. Charter vessels account for 60-70% of the total recreational catch. The majority of effort and catch is concentrated along the central part of the Oregon coast, though landings occur in ports coast wide. The

⁵ Because the London Group (1999) study covered all CPFV species, not all of this economic activity can be directly attributed to HMS CPFV fishing out of San Diego Bay.

majority of the charter effort is out of Depot Bay and Newport, with less effort out of Garibaldi and Brookings.

A.2.8.2 Private Sport Fishing Fleet

The California recreational, rod-and-reel fishery, fishery for tuna, striped marlin and swordfish developed about the turn of the century. The Tuna Club of Avalon, Santa Catalina Island, California was established in 1898, and set the standard for big game fishing in waters off California which is widely adhered to today, "fair play to game fishes" (United Anglers of Southern California 2001: From brochure Recreational Fishing in Southern California). To this end, strict rules were designed to give the fish an even chance, and these rules became the foundation for the International Game Fish Association's regulations for fish to qualify for its record books.

The first tuna caught by an angler to receive public acclaim was a 183 lb. bluefin taken in 1898. A 251 lb. bluefin, the largest yet taken using sporting tackle, was caught in 1899. In 1903, the first striped marlin caught with rod and reel was taken off Catalina Island. The first swordfish taken by an angler was caught in 1913, using a kite to present the bait and a prototype disc clutch reel to land the fish (United Anglers of Southern California 2001: From brochure Recreational Fishing in Southern California). The development and early history of big game fishing in southern California is described by Holder (1910), Grey (1919), Ries (1997) and Farrior (1997).

Highly migratory species continue to be highly prized by the recreational fishing community (Tables A-59 and A-60) although their catches of tuna and swordfish are relative low in quantity compared to the commercial catch. Swordfish and striped marlin were listed as game fish in 1931 and required a sport-fishing license issued by the CDFG. The California State legislature banned the use of harpoons to take striped marlin in 1935 and further curtailed the sale and import of striped marlin in 1937 thus preserving that southern California fishery entirely for recreational anglers. Private vessel anglers are not required to report their fishing activity or catches. Catch data from the private sport vessels are obtained through occasional CDFG monitoring and the MRFSS. There is little opportunity to recreationally fish for marlins and swordfish north of San Francisco. Most striped marlin fishing is from privately owned vessels based in local southern California marinas.

Many private vessel owners also possess Mexican fishing licenses and travel south looking for schools of tuna and billfish. Sport fishing vessels will target tuna when they move into southern California and northern Baja California waters. The estimated number of private vessels in southern California fishing large pelagic fish is 4,000 to 6,000 annually, although accurate census and economic information is currently unavailable for this fishery.

The rod-and-reel season for striped marlin and swordfish can begin as early as May and continue through November, although most fish are taken from July to October. Fishing locations are primarily in the SCB from Santa Barbara, south and into Mexico. Many California anglers will fish the productive waters around Mexico's Coronado Islands for tuna, marlin, dorado and coastal pelagic species. A few private vessel owners travel as far south as Magdalena Bay and Cabo San Lucas in the fall and winter.

California recreational anglers were allowed the use of hand-held harpoons to take swordfish until 1971. Catching swordfish with a rod-and-reel is difficult because they are usually not receptive to bait or artificial lures while finning at the surface. A few anglers now successfully target swordfish at night using techniques adapted from the East Coast that employ the use of light-sticks.

Fishing records from the Balboa Angling Club, San Diego Marlin Club and the Tuna Club of Avalon provide catches in numbers and individual sizes for striped marlin and swordfish taken by their members. Reported swordfish catches totaled 577 fish between 1909 and 1996, peaking at 127 fish in 1978. Periods of greatest swordfish catch occurred between 1915 to 1930 and from 1969 to 1981. The increased catches during the latter period correspond to a similar increase in landings from California's commercial harpoon fishery and may reflect a generally higher abundance in the southern California waters. Higher abundance may also be related to years following El Niño events (Coan et al. 1998). The average weight of swordfish recorded at these three southern California sportfishing clubs declined during the 1909-96 period (Figure A-17).

Reported annual catches of striped marlin by the Balboa Angling Club, San Diego Marlin Club and the Tuna

Club of Avalon have declined in recent years from 761 fish per year during the 1980s, to 273 fish per year during the 1990s (Figure A-18). The period between 1955 and 1965 had some of the highest catches in a single season, but the 1980s had more consistent catches. Total annual recreational striped marlin catch -- kept or released from the three clubs -- declined from a peak of approximately 1,100 in 1963 to a low of about 180 in 2000. No year in the last decade saw a catch in excess of 400 fish. Nine or ten years in the decade of the 1980s yielded catches in excess of 400 fish. The time series of catches shows an apparently significant decline from a peak of about 1100 fish/year in 1963 to a low of about 180 in 2000.

The average weight of striped marlin weighed in at the southern California sportfishing clubs from 1903 to 2000 was 68 kg (150 lbs.) (Figure A-19) ranging from 91 kg to 55 kg (200 to 120 lbs.) (Holts and Prescott 2001). Early weight records possibly include a few blue marlin and/or swordfish incorrectly identified as striped marlin. Large striped marlin were more plentiful in the SCB during the 1920s although none in excess of 160 kg (350 lbs.) have been landed since the 1950s. The International Game Fish Association's all tackle record for striped marlin is 224 kg (494 lbs.) taken off New Zealand.

The only estimates of recreational fishing effort for marlin and swordfish come from the SWFSC's Billfish Angler Survey (Squire and Au 1990, Holts and Prescott 2001). The survey began in 1969, and collects catch and effort data from individual anglers fishing for billfish and swordfish in key locations throughout the Pacific Ocean. The average catch rate for all billfish from all areas was 0.50 fish per angler day over the 1995-99 period, and reached an all time high of 0.61 in 2000. The lowest catch rates averaged 0.34 during the mid-1970s.

Recreational striped marlin catch rates for southern California, Baja California and Hawaii are estimated using data from the Billfish Angler Survey. Highest angler success for striped marlin occurs off Baja California 0.41 fish per angler day in 1999 compared to a fairly consistent 0.10 catch rate for southern California and Hawaii (Figure A-20). Even though there appears no overall trend for the period several periods of highs and lows are evident. For example, periods immediately following strong El Niño episodes are marked with greater variance between years. Squires and Au (1990) found that joint-venture longline fisheries operating near Baja California in the 1970s was related to declining angler catch rates for striped marlin. Mexico restricted foreign longlines from fishing in its EEZ for two years beginning in 1976, during which time, the angler catch rate for billfish off Baja California increased by almost 60%. A period of limited longlining that began in 1982 was again correlated with a decline in angler catch rates. Mexico canceled all longline permits to fish billfish and tuna within its EEZ in 1990. Patterns of striped marlin catch rates during the 1969-99 period should also be considered in the context of the technological changes in angling effort that have occurred over the period (i.e. Loran A, Loran C, GPS, satellite imagery, faster vessels, etc.). Due to the relative difficulty in catching swordfish with rod-and-reel gear, recreational swordfish catch rates are significantly lower than striped marlin catch rates. Anglers fishing in southern California (and northern Mexico) reported swordfish catches of 0 to 0.002 fish per day between 1990 and 1997.

Sport fishers successfully target both juvenile and adult shortfin mako and common thresher sharks. Shark angling has experienced increased popularity in southern California waters during the last decade. Private vessel sport-fishing effort targeting blue and shortfin mako sharks reached 410,000 trips in 1989 and has remained high. Currently there are about eight shark fishing tournaments held annually in southern California.

The SWFSC's angler-based Billfish Tagging Program provides data on the movement, geographic distribution patterns and survivability of billfish caught off the West Coast. In 1999, 486 individual anglers and 158 captains reported tagging at least one billfish (Holts and Prescott 2001). Southern California sportfishing club records show the number of striped marlin released or tagged and released has increased from 20% to 50% in the 1980s to over 90% in the most recent years. In 1998 bluefin tuna was incorporated into the tagging program.

Recapture data indicate that striped marlin and swordfish move extensively throughout the Pacific, but without specific patterns of migration. These movements, whether nomadic wanderings or generally discursive, expose them to high-seas commercial and coastal recreational fisheries. Striped marlin tag releases total 20,503 with 327 recaptures giving a 1.6% rate of recapture (Table A-63). The majority of tagged striped marlin were released from Hawaii, southern California, and Baja California Sur. Recaptures indicate movement from

southern California to Baja California, Sur (Figure A-21) but little or no movement in the reverse direction. Striped marlin tagged off southern California and Baja California have been recaptured in the central Pacific. There is no indication of direct movement from Hawaii to the West Coast.

Cooperating billfish anglers and U.S. commercial fishers have tagged a total of 504 swordfish. Recaptures total 15 for a return rate of 2.98%. (Table A-63). The SWFSC, along with cooperating southern California billfish anglers and commercial fishers, tagged 17 swordfish in 1978 in an effort to identify movement patterns in the SCB. Six of those swordfish were recaptured within 35 days and none had moved more than 30 nm (Figure A-22). Two swordfish tagged north of Hawaii on U.S. longline vessels moved northeast toward the West Coast and were recaptured by other commercial fishing vessels (Figure A-22). One swordfish was recovered near San Clemente Island by a drift gillnet vessel.

In Oregon, it is difficult to distinguish the charter/party boat fishery from the private vessel recreational fishery. Private vessels make up approximately 30-40% of the total recreational catch. The majority of effort and catch is concentrated along the central part of the Oregon coast, though landings occur in ports coast wide. The majority of private vessel effort is from Garibaldi to Newport, and Coos Bay and Brookings.

Most recreational albacore fishing in Oregon occurs within 50 miles of shore with most private vessels staying much closer (Holts 1985). Fishing is usually limited to mid-July through early October, with most of the effort and catch occurring from mid-August through early September. Anglers fishing for albacore off Oregon will usually troll "tuna" jigs near the surface at 5-8 knots, and will concentrate their effort in waters with surface temperatures of 60° F or higher.

A.2.8.3. Enhanced Collaboration with Pacific Anglers.

The rarity of billfish encounters and difficulties of capture suggest that an alliance between fishers and scientists will improve access to that resource. Modern technology such as molecular diagnostic assays, archival transmitting tags, and laser measurement devices can potentially produce more and better information during the brief period of contact when a fish is brought to the vessel for tagging. Small tissue and blood samples collected from released fish can greatly improve stock assessments by providing new information on the stress of capture, post-release survival, population structure, growth rate, age, sex, reproductive state, and nutritional condition.

Participants in the recent workshop, Pacific Federal Angler Affiliation for Billfish, (Hunter and Holts 1999) decided the best way to meet future information needs was to expand on the SWFSC's existing Billfish Tagging Program and Angler Survey. Thus an enhanced program would encourage billfish anglers to tag and release billfish as before, but in a way that will greatly increase the kinds and quality of scientific information derived from their fishing trips. Collaborative projects to improve information needed for stock assessments included the means to acquire specific life history data, time series abundance estimates, identify movement patterns and stock boundaries, and measures of physical condition at time of release.

Implementation of the following recommendations show great promise while the more costly elements await additional resources:

- Construct an Internet web site for information exchange with the angling community.
- Develop a volunteer bridge log to establish a time series index of catch-per-unit of effort.
- Obtain better length-at-catch data.
- Obtain historic club records for time series indexes of abundance.
- Upgrade tournament data recording to include some measure of total fishing effort.
- Implement tissue sampling for genetic and physiological studies.

- Develop advanced tagging methodologies including electronic tags and measuring devices.

A.3 HMS Commercial Fishing Vessels

This section presents information on HMS commercial fishing vessels. The section first examines the number of vessels participating in west-coast HMS fisheries by the particular HMS fishery in which they engage, and the port that is most prominent with respect to their overall exvessel earnings. Next the number of annual landings by HMS vessels is investigated as an indication of annual effort production in HMS fisheries. Then the amount of annual HMS landings and corresponding exvessel revenues for HMS vessels are considered in terms of their most economically important fishery. Finally, vessels participating in west-coast HMS fisheries are described in terms of their physical characteristics.

The data used to characterize HMS commercial fishing vessels are from Washington, Oregon, and California landings receipts (fish ticket) data maintained in the PacFIN management data base, as well as the Coast Guard and State Vessel tables maintained in PacFIN for data on vessel physical characteristics. Annual vessel summaries were created for each vessel that had any West Coast landings of HMS over the 1981-99 period. Vessel summaries consist of the year of participation, the number of HMS landings the vessel made during the year, quantities landed and exvessel revenues for HMS as well as for groundfish, salmon, coastal pelagics, shrimp, crab, shellfish, and collectively other species. The vessel summaries also contain the vessel's principal species, principal gear and principal port for the year. West-coast based vessels that had no West Coast landings during the year would not be included in that year's vessel summaries. This could exclude some West Coast based distant water, large purse seine vessels (section A.2.2.), and possibly some south Pacific albacore trollers (section A.2.1.) from the analysis if they did not make a West Coast HMS landing during the year.

A vessel's principal species is the species, relative to all species the vessel landed, that accounted for the largest share of its total exvessel revenues for the year. A vessel's principal gear is the gear, relative to all the gears used by the vessel during the year, that accounted for the greatest share of its total exvessel revenues for the year. A vessel's principal port is the port, relative to all ports at which the vessel made landings, that accounted for the largest share of the vessel's total exvessel revenues for the year. If a vessel's principal species was an HMS in a particular year, the vessel was defined as an "HMS vessel" in that year.

A.3.1 Number of Commercial Fishing Vessels Participating in HMS Fisheries

The number of vessels making West Coast landings of HMS declined precipitously from 1981 through 1991. From 1991 through 1999 the number of vessels with HMS landings varied, but increased overall by 1999 (Figure A-23). Throughout the period from about 40% to 55% of the vessels with HMS landings were “HMS vessels”, i.e. those whose principal species was an HMS.

In any year there were more vessels making albacore landings than any other HMS (Table A-64). There were a relatively large number of vessels making West Coast landings of tropical tunas early in the period because of the major presence of the U.S. tuna industry on the West Coast during the early 1980s, but the number declined disproportionately compared to the overall decline in numbers of HMS vessels from 1981-99 with the move of the major canned tuna processors offshore. The decline in the number of vessels making swordfish landings during the period was mainly due to the shift from swordfish harpoon vessels to limited entry drift gillnet vessels in the swordfish fishery. In recent years drift gillnet activity has decreased, which partially accounts for the decrease in number of vessels landing sharks. The increase in numbers of vessels landing dorado is interesting. Dorado is not a targeted commercial species, but appears to be an increasing incidental catch by vessels using surface hook-and-line gear and vessels using longline gear (Table A-65).

Most vessels landing albacore used surface hook-and-line gear during the 1981-99 period (Table A-65). Vessels using surface hook-and-line gear also landed relatively large amounts of other HMS compared to vessels using other HMS gears. Because the drift gillnet fishery was a limited entry fishery during most of the period, vessels that used this gear to harvest swordfish and sharks were probably the same as those landing albacore over the period. Vessels using purse seine gear were those participating in the coastal purse seine fishery, or the distant water tropical tuna, large purse seine fishery, or both. Most of the purse seine vessels landing albacore and bluefin tuna were probably distinct from the vessels landing tropical tunas, at least early in the period.

The principal ports of vessels with HMS landings over the 1981-99 period ranged from Westport, Washington in the north to San Diego, California in the south (Table A-66). It should be pointed out that for many vessels with HMS landings, even those that are “HMS vessels”, the principal port (based on the greatest share of all exvessel revenues) was associated with a non-HMS (e.g. a vessel may land its HMS at a number of different ports but land all of another of its important species at one port). For this reason a vessel's principal port may be different from the port where it makes most of its HMS landings. While vessels can, and frequently do, land at a number of ports during the year they can only have one principal port. In Washington, Westport and Illwaco were major ports for vessels with albacore landings. In Oregon, more vessels with HMS landings made Newport their principal port not so much on the basis of their HMS landings but on their landings of non-HMS. Ports south of Santa Barbara were the principal ports for vessels landing HMS in California, particularly early in the period. Again the presence of canned tuna processors in southern California early in the period, and the prominence of HMS fisheries off southern California help to explain this. Vessels with HMS landings whose principal ports were in northern California probably depended more on non-HMS and land their HMS elsewhere.

The numbers of vessels with West Coast HMS landings over the 1981-99 period were also analyzed with respect to their principal species, principal gear (Table A-67) and principal port (Table A-68). For most vessels whose principal gear was surface hook-and-line, their principal species was by far albacore (Table A-67). For most vessels whose principal gear was drift gillnet, swordfish was the principal species followed by sharks. In most years, most vessels with pelagic longline as their principal gear had non-HMS as their principal species. Swordfish was the next most important principal species for longline vessels. Early in the period there were a large number of vessels whose principal gear was purse seine and principal species was tropical tunas. The number has declined in recent years, and most vessels with purse seine as a principal gear had non-HMS as a principal species. This likely reflects the importance of HMS to vessels in the coastal pelagics fisheries. For virtually all vessels with harpoon as their principal gear swordfish was their principal species. For vessels whose principal gear was a non-HMS gear during the period most had a non-HMS as principal species. However, there were a number of vessels that had a non-HMS principal gear and an HMS as a principal species during the period, particularly swordfish as the principal species. This is probably due to reporting problems on fish tickets where in California drift gillnet gear was difficult to distinguish from other

entangling net gears prior to 1994. From 1994 on, the numbers appear more reasonable in this regard, and also with regard to the number of vessels with drift gillnet as principal gear and swordfish or shark as principal species before 1994.

Many vessels with West Coast HMS landings from 1981-99, with a non-HMS as their principal species, had crab, salmon or coastal pelagics as their principal species (Table A-69). This likely reflects the large number of West Coast vessels for which salmon, albacore and crab characterizes their annual fishing cycle, and the dependence of coastal pelagics vessels on albacore, bluefin and tropical tunas. For many West Coast vessels HMS are an important, but not the most important, component in their overall fishing operations.

The principal ports for “HMS vessels” during the 1981-99 period were primarily located south of Santa Barbara, California (Table A-68), reflecting the significance of HMS fisheries for albacore, bluefin tuna, swordfish, sharks and tropical tunas off California. Westport and Ilwaco in Washington and Astoria and Newport are major ports for “HMS vessels” along the north coast primarily for landings of albacore.

A.3.2 Number of Landings by Vessels Participating in HMS Fisheries

The number of HMS landings made by vessels with West Coast landings of HMS during the 1981-99 period were reviewed. The pattern of the number of landings (Figure A-24) almost duplicates the pattern for changes in the number of vessels (Figure A-23). Over the period almost 70% of the annual landings were made by “HMS vessels” suggesting a disproportionate production of effort by “HMS vessels” relative to vessels with HMS landings but whose principal species was a non-HMS.

The number of West Coast landings by “HMS vessels” from 1981-99 were categorized by principal species and principal gear (Table A-70). For “HMS vessels” whose principal gear was an HMS gear, albacore surface hook-and-line vessels, swordfish drift gillnet vessels and swordfish harpoon vessels tended to make the most landings annually. This might be expected given the nature of these West Coast fisheries in terms of vessel harvesting capacities and fish handling capabilities i.e., relatively large number of small vessels of limited range making frequent trips of short duration. The large number of HMS landings by vessels whose principal gear is a non-HMS gear and whose principal species is swordfish or shark, especially before 1994, probably reflects the reporting concerns discussed above.

For vessels with a non-HMS principal species the pattern of landings (Table A-71) mirrors that of numbers of such vessels participating in HMS fisheries (Table A-69). There are a comparatively large number of HMS landings by coastal pelagics, crab, salmon and groundfish vessels (as defined by their principal species) indicating the importance of HMS in their combined fishing activities.

A.3.3 Quantities Landed and Exvessel Revenues for Vessels Participating in HMS Fisheries

The amounts of HMS landed and corresponding exvessel revenues for vessels with West Coast landings of HMS during the 1981-99 period were also examined. For the most part, the pattern of landings (Figure A-25) and the pattern of real exvessel revenues (Figure A-26) conforms to those of vessel participation (Figures A.23 and A.24). Quantities of HMS landed and their real exvessel values declined sharply through 1991 except for a brief recovery in 1987 and 1988. Between 1991 and 1999 quantities landed increased slightly while real revenues remained fairly stable indicating a moderate decrease in the overall implicit real exvessel price. “HMS vessels” delivered almost 80% of the annual HMS landings and generated 70% of annual HMS exvessel revenues over the period.

West coast landings and exvessel revenues by “HMS vessels” were categorized by principal species and principal gear from 1981-99 (Tables A-72 and A-73). Total HMS landings and exvessel revenues were dominated by vessels whose principal gear was purse seine and principal species tropical tunas early in the 1981-99 period mainly due to the presence of major U.S. canned tuna processors in southern California at the time. With their departure the proportion of HMS landings and exvessel revenues by “HMS vessels” whose principal gear was surface hook-and-line and principal species was albacore became relatively more significant. “HMS vessels” whose principal species was swordfish figured prominently in the exvessel value of HMS landings during the period. Most of the swordfish landings reported under “other” principal gear can

probably be attributed to drift gillnet gear in view of the fish ticket reporting problems -- an alternative entangling net gear reported instead of drift gillnet -- alluded to above.

For vessels with a non-HMS principal species, those with coastal pelagics as their principal species landed substantial quantities of albacore, bluefin and tropical tunas during the period (Table A-74) which accounts for the relatively high exvessel value of their HMS landings (Table A-75). Albacore was also significant in the landings of crab, groundfish, salmon and shrimp vessels (as defined by their principal species); these vessels also had landings of swordfish and shark during the period. Shrimp vessels landed relatively large amounts of tropical tunas for non-HMS vessels.

A.3.4. Physical Characteristics of Vessels Participating in HMS Fisheries

Physical vessel characteristics available in the Coast Guard and state vessel tables in the PacFIN database include length, gross weight, net weight, year built and horsepower as well as various identifiers. Vessel characteristics were compiled for those vessels whose principal fishery (species and gear combined) was an HMS fishery during 1981-99. Almost all of these vessels had length data reported whereas many had incomplete weight and horsepower data. Thus, only length was examined to physically describe vessels by principal HMS fishery (Table A-76).

The largest vessels participated in the large purse seine fishery (tropical tunas), ranging from 18 ft to 239 ft and averaging 167.3 ft during 1981-99, all years together. Coastal purse seiners (albacore and bluefin tunas) ranged from 21 ft to 226 ft and averaged 80.4 ft during this period. Longliners (all HMS) ranged in size from 17 ft to 97 ft and averaged 69.6 ft. Albacore surface hook-and-line vessels ranged from 10 ft to 360 ft and averaged 47.9 ft. Swordfish and shark drift gillnet vessels ranged from 18 ft to 85 ft and averaged 44.6 ft. The smallest vessels were swordfish harpoon vessels which ranged from 17 ft to 83 ft and averaged 38.0 ft.

Vessel lengths were grouped into four categories to see any changes in vessel length distributions during the 1981-99 period for each HMS fishery (Figures A-27, A-28, A-29, A-30, A-31, A-32). Vessels that participated in the albacore surface hook-and-line fishery tended to become greater in length, increasing from an average length of 43.9 ft in 1981 to 51.7 ft in 1999. From 1981 to 1999 the proportion of albacore surface hook-and-line vessels over 50 ft became larger (Figure A-27). Vessels in the coastal purse seine fishery showed an increase in average length from 44.0 ft in 1981 to 96.0 ft in 1999 (Figure A-28). In the swordfish and shark drift gillnet fishery, there was an increase in the proportion of vessels over 50 ft at the end of the period; however, most of the vessels were still under 50 ft (Figure A-29). The average length of drift gillnet vessels went from 39.7 ft in 1981 to 46.2 ft in 1999. The vessel length distribution remained relatively stable for the swordfish harpoon fishery over the period (Figure A-30), with the average vessel length decreasing slightly from 38.0 ft in 1981 to 34.9 ft in 1999. The average length of vessels participating in the large purse seine fishery decreased over the period from 170.4 ft in 1981 to 134.6 ft in 1999, although the majority of large purse seiners continued to be over 75 ft (Figure A-31). The proportion of longline vessels over 75 ft has increased in recent years (Figure A-32). The average length of longliners rose from 52.0 ft in 1981 to 74.7 ft in 1999.

The HMS vessel length distributions were further broken down into five West Coast areas (Washington, Oregon, Northern California, Central California and Southern California) to which vessels were assigned based on their principal port (Tables A-77, A-78, A-79, A-80, A-81). Only albacore surface hook-and-line vessels were distributed along the entire West Coast, which therefore allowed length distribution comparisons between all areas (Figures A-33, A-34, A-35, A-36, A-37). Swordfish and shark drift gillnet vessels had principal ports in all areas, but mostly in California (Figures A-38, A-39, A-40). The rest of the HMS fisheries had vessels whose principal ports were almost exclusively in southern California and consequently no area comparisons were made.

By the end of the 1981-99 period there were more larger albacore surface hook-and-line vessels in southern California, northern California and Washington (Figures A-33, A-34, A-35, A-36, A-37). Although there were more larger albacore surface hook-and-line vessels in central California until the early 1990s, by 1999 the trend had reversed and there were more smaller vessels. During 1981-99 in Oregon, vessel length distributions showed little change. The largest albacore vessels were in northern California and Washington, averaging 47.0 and 45.1 ft respectively in 1981 and 60.1 and 58.3 ft respectively in 1999. Vessels in southern

California and Oregon averaged 39.1 and 48.2 ft in 1981 and 52.1 and 50.0 ft in 1999 respectively. Vessels whose principal port was in central California averaged 46.1 ft in 1981 and 39.0 ft in 1999.

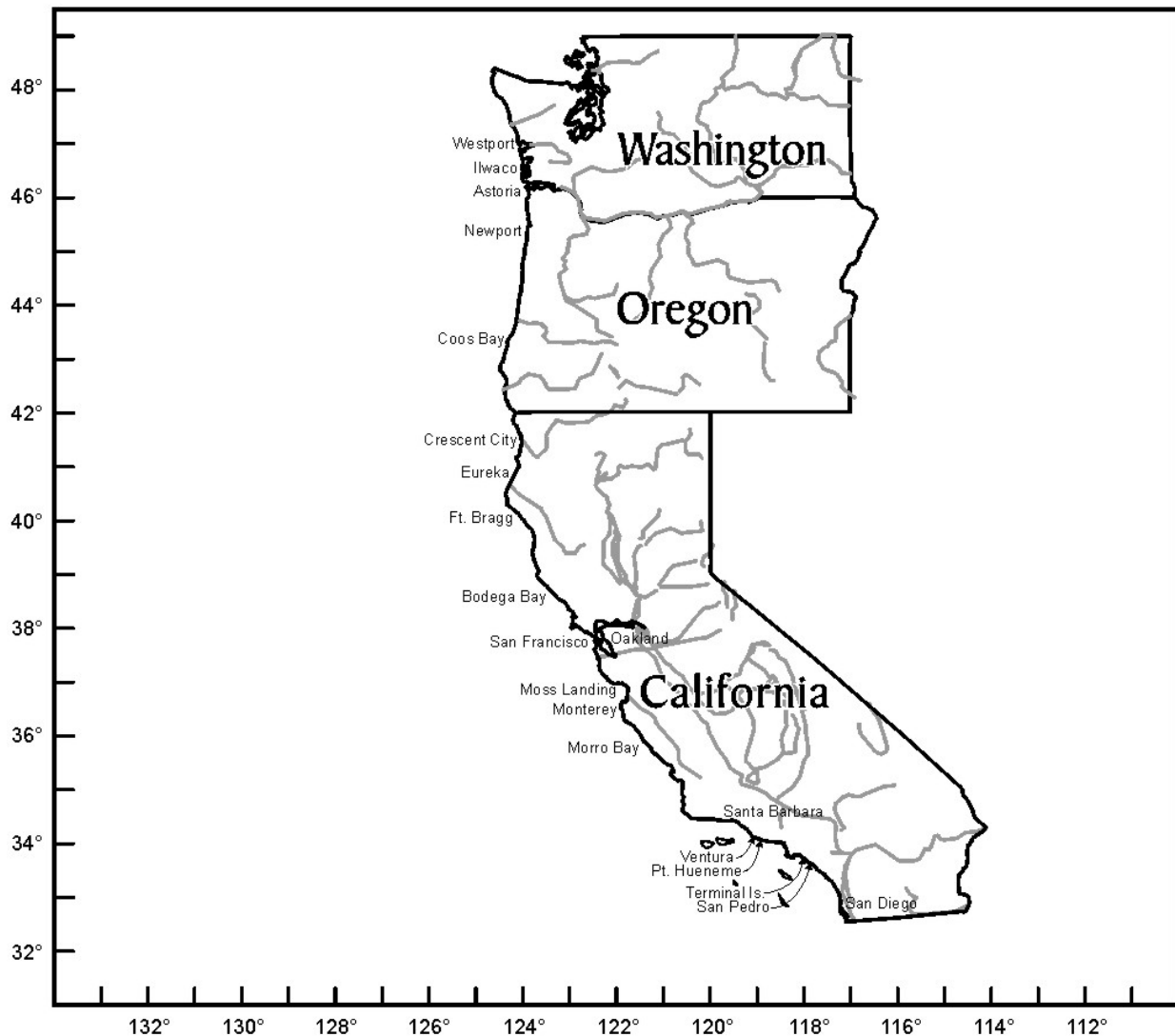
In the swordfish and shark drift gillnet fishery, most of the vessels whose principal port was in southern or central California were under 50 ft (Figures A-38, A-39). Drift gillnet vessels whose principal port was in northern California tended to be greater than 50 ft (Figure A-40). From 1994 to 1998 northern and central California vessels were proportionately larger than those in Southern California and in 1999 the opposite was true. For southern California, the average length increased from 39.7 ft in 1981 to 46.9 ft in 1999. For central California, the average length rose slightly from 42.0 ft in 1985 to 42.7 ft in 1999; for northern California, it varied from 53.0 ft in 1992 to 50.8 ft in 1998.

A.4 Characteristics of HMS Communities

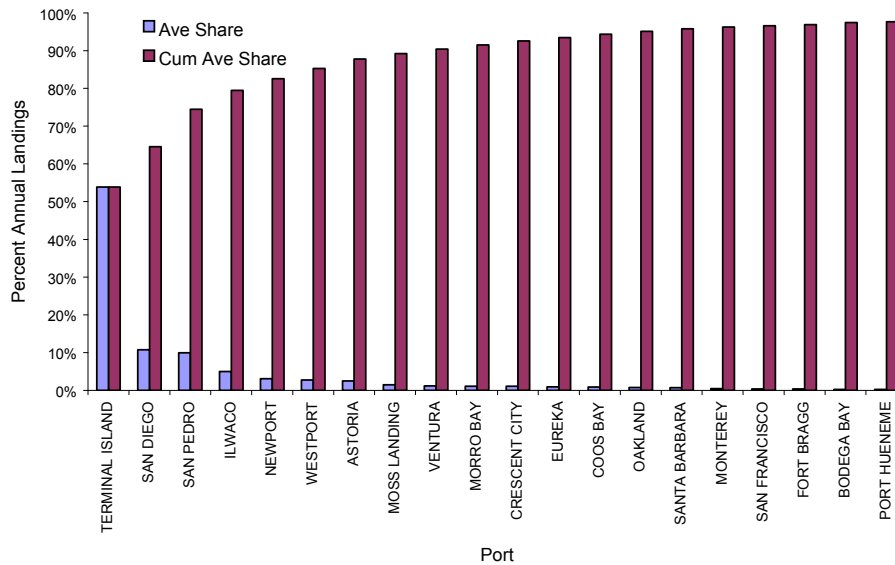
This section presents HMS fishing activity, general economic and demographic information for those West Coast communities that received a significant share of HMS commercial landings over the 1981-98 period, and for their support of HMS recreational fisheries. This information is combined to provide a socioeconomic-demographic profile of HMS communities in Washington, Oregon and California. The ports, counties and areas that comprise the communities for which this information was developed include:

- Westport, Grays Harbor County, WA;
- Ilwaco, Pacific County, WA;
- Astoria, Clatsop County, OR;
- Newport, Lincoln County, OR;
- Coos Bay, Coos County, OR;
- Crescent City, Del Norte County, CA;
- Eureka, Humboldt County, CA;
- Fort Bragg, Mendocino County, CA;
- Bodega Bay, Sonoma County, CA;
- San Francisco Area
 - San Francisco, San Francisco County, CA
 - Oakland, Alameda County, CA;
- Moss Landing, Monterey County, CA;
- Monterey, Monterey County, CA;
- Morro Bay, San Luis Obispo County, CA;
- Santa Barbara Area
 - Santa Barbara County, CA
 - Ventura, Ventura County, CA
 - Port Hueneme, Ventura County, CA;
- San Pedro, Los Angeles County, CA;
- Terminal Island, Los Angeles County, CA;
- San Diego, San Diego County, CA.

These were designated HMS communities based on their relative contribution to total coastwide HMS commercial landings over the 1981-98 period, and for their support of HMS recreational fisheries. When ranked by average annual share of total HMS commercial landings for the 1981-99 period, Terminal Island, California ranked highest with an annual average share of 54% of total HMS landings (see below). A lack of port specific catch, participation and economic data precluded ranking ports according to their dependence on HMS recreational fisheries.



Major HMS ports by average annual share of total HMS landings, 1981-98.



The notion of community frequently extends beyond that associated with a specific geographic local where residents are dependent on fishery resources or are engaged in the harvesting and processing of these resources (as per MSFCMA National Standard 8). There are also communities based on a distinct occupations and communities formed around a specific interest (Conway et al. 1999). The HMS drift gillnet fishery could be considered an occupational community, whereas, based on their common interest in HMS sportfishing, members of a particular angling club or recreational fishing organization might consider themselves a community of interest. Information on these non-geographic communities particularly in the case of recreational HMS fishing is substantially lacking, and represents an important research and data need.

A.4.1 Overview of Tables and Figures

Each profile consists of a brief narrative that provides some background about the county level economy and describes the character of the HMS ports within the county. Where applicable, an Internet website is provided in order to access more information on the port or county under consideration. For each port there is a series of tables and figures that indicate the importance of HMS fishing activity within the port over the 1981-99 period:

- A table that indicates the number of commercial fishing vessels making HMS landings for which that port is the vessel's principal port⁶, by the vessel's principal species⁷.

⁶ A vessel's principal port is the port that accounts for the largest proportion of its total exvessel revenues.

⁷ The principal species is the species that accounted for the largest proportion of the vessel's total exvessel revenues.

- A table showing the number of commercial fishing vessels making HMS landings in the port, the amount of landings by these vessels (HMS and other species) and corresponding exvessel revenues for the period.
- For commercial fishing vessels whose principal species is a HMS and whose principal port is the port under consideration, a figure showing the proportion of these vessels of all vessels making HMS landings at the port, and the proportion of these vessels of the total number of vessels making landings at the port.
- A figure showing the proportion of commercial HMS landings and exvessel revenues of total landings and exvessel revenues in the port.
- A figure showing the number of HMS processors and buyers and the number of all processors and buyers in the port.
- A figure presenting total income multipliers for landings of HMS in the port based on 1996 landings and exvessel revenues.

At the county and port level there is a summary of demographic and economic activity information including:

- Population figures for 1990 and 2000, population composition by race and Hispanic origin, the age structure of the population, population composition by levels of educational attainment, and composition of the labor force gender.
- Information about employment by Standard Industrial Classification (SIC) and North American Industry Classification System (NAICS)⁸, labor and proprietor income, and number of establishments by SIC and NAICS categories.

A.4.2 Sources and Explanations of Information

A.4.2.1 HMS Fishing Activity

Information on number of vessels, quantities and exvessel values of landings and number of buyers was developed from Washington, Oregon and California landings receipts (fish tickets) maintained in the PacFIN Management Data Base. Fish tickets are records of each exvessel transaction between fishers and fish buyers. The fish ticket contains basic information on the landing, including the fishing vessel, the port of landing, the fish buyer and the gear primarily used. In addition, there is a separate line on each fish ticket (fish ticket line) that records the name of each species and the quantity landed in pounds, the exvessel price per pound, the condition of the catch (i.e. the extent to which any processing has occurred) and the gear used to catch that species if different from that primarily used.

A.4.2.2 Demographics

The demographic summaries contain information on population size and structure by county and port for 1990 and 2000, including race and Hispanic origin percentages, the age structure of the population, population percentages by level of educational attainment and gender composition of the labor force.

This information was developed from U.S. Census data for 1990 and 2000.

⁸ In 1997, the NAICS system replaced the SIC system of industry classification for reporting economic census statistics. While many of the individual SIC industries correspond directly to industries as defined under the NAICS system, most of the higher level groupings do not. There is no direct correspondence between SIC-07 (agricultural services, forestry and fishing) and NAICS-11 (forestry, fishing, hunting and agriculture support). The nearest correspondence is between SIC-912 (finfish) and NAICS-114111 (finfish fishing). Unfortunately county level statistics for the SIC-912 classification were not available for this investigation.

Population Size:

U.S. Bureau of the Census, 1990 Census of Population and Housing, Summary Tape File 1.
U.S. Bureau of the Census, Profiles of General Demographic Characteristics 2000, U.S. Government Printing Office, Washington, DC, 2001.

Race and Hispanic Origin:

U.S. Bureau of the Census, 1990 Census of Population and Housing, Summary Tape File 1.
U.S. Bureau of the Census, Profiles of General Demographic Characteristics 2000, U.S. Government Printing Office, Washington, DC, 2001.

Age Structure:

U.S. Bureau of the Census, 1990 Census of Population and Housing, Summary Tape File 1.
U.S. Bureau of the Census, Profiles of General Demographic Characteristics 2000, U.S. Government Printing Office, Washington, DC, 2001.

Educational Attainment:

U.S. Bureau of the Census, 1990 Census of Population and Housing, Summary Tape File 3.

Labor Force:

U.S. Bureau of the Census, 1990 Census of Population and Housing, Summary Tape File 3.

A.4.2.3 Economic Activity

The economic activity summaries contain information on employment, income and number of establishments for the highest aggregated SIC and NAICS county level economic sectors.

This information was developed from U.S. Census, county business patterns data for 1993 and 1999:

U.S. Bureau of the Census, County Business Patterns 1993 (WA, OR, CA), U.S. Government Printing Office, Washington, DC, 1995.

U.S. Bureau of the Census, County Business Patterns 1999 (WA, OR, CA), Washington, DC, 2000.

A.4.3 Community Profiles

A.4.3.1 HMS Community Profile: Westport, Grays Harbor County, WA

Grays Harbor County and Westport <http://ci.westport.wa.us/about.htm>

The economic structure of Grays Harbor County generally resembles that of the state. In 1999, the manufacturing sector provided about one-third of the County's non-agricultural income. The important sectors in terms of their contribution to county income in 1999 were forestry, fishing and agriculture support, retail trade and health services.

Westport, WA is located at the mouth of Grays Harbor on the southernmost peninsula known as Point Chehalis. The area was in regular use as a summer resort by local Native American tribes before Thomas Barker Speake and his family, the first white settlers, arrived early in the summer of 1857.

By 1914, Westport was a busy, though small, center for fishing, shellfish harvesting, seafood processing and

tourism. Among the earliest structures built at Westport, the Westport Lighthouse, dedicated on April 14, 1898, still stands as a majestic beacon for weary mariners anxious to return home from the sea. The City of Westport was incorporated on June 26, 1914.

Westport still relies on fishing, shellfish harvesting, seafood processing and tourism for much of its livelihood. More recently, boat building has also become an important part of Westport's economic base.

Sportfishing is an important component of the Westport economy. The Westport Charterboat Association (WCBA) is a non-profit corporation whose members are charterboat owners, operators, and booking services. WCBA was founded in 1957 for the purpose of promoting charterboat fishing for salmon in the Westport, Washington area. In the mid-1970s there were over 200 charterboats operating from Westport. Annually, over 250,000 anglers fished out of Westport and caught nearly one half million salmon per year. Today there are 30 vessels in the Westport sportfishing fleet operating out of 9 booking services. In addition to salmon, the fleet fishes for albacore tuna, halibut, lingcod, and many varieties of rockfish.

Albacore tuna are usually in range off Westport from July through early October. Charter vessels fish with live anchovies for bait. Trips usually leave late at night and arrive at the fishing grounds at daylight. Trip duration is pre-arranged and can last from 1 to 3 days. There is no bag limit on albacore, and catches average 4-6 fish per person per day but up to 20-25 per person have been caught on multi-day trips. Albacore range from 12 to 25 pounds with an occasional fish over 30 pounds.

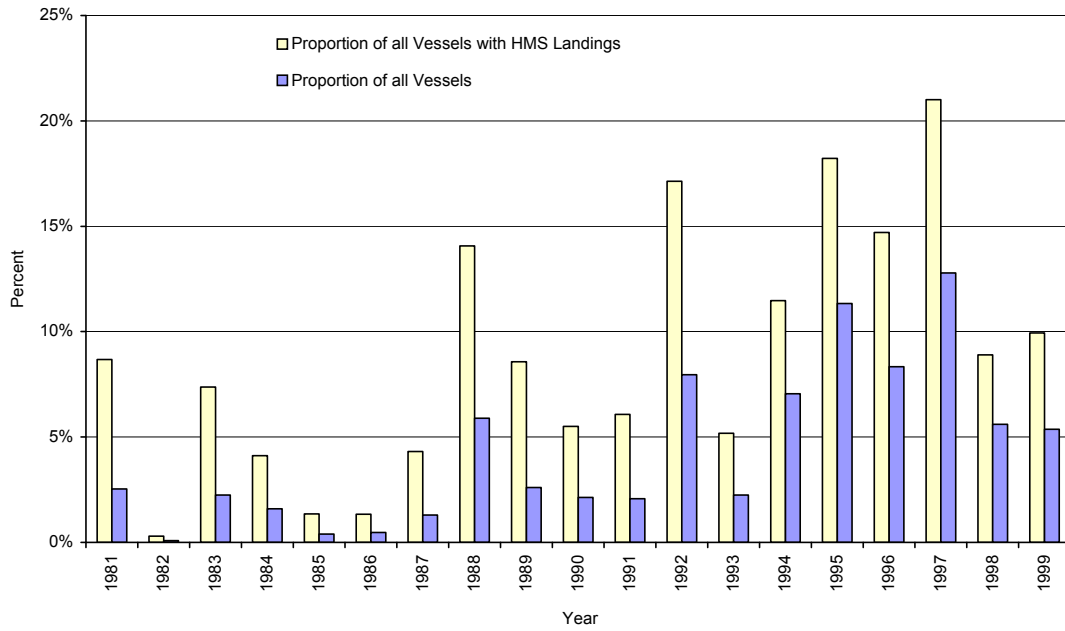
Number of vessels with HMS landings, for which Westport, WA is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	31						71
1982	1						21
1983	23						37
1984	7						14
1985	3						9
1986	2			1			10
1987	10			1			18
1988	46						43
1989	21						6
1990	17						12
1991	15						3
1992	55						51
1993	13						30
1994	28						39
1995	39						32
1996	35						42
1997	50						56
1998	13						26
1999	16						32

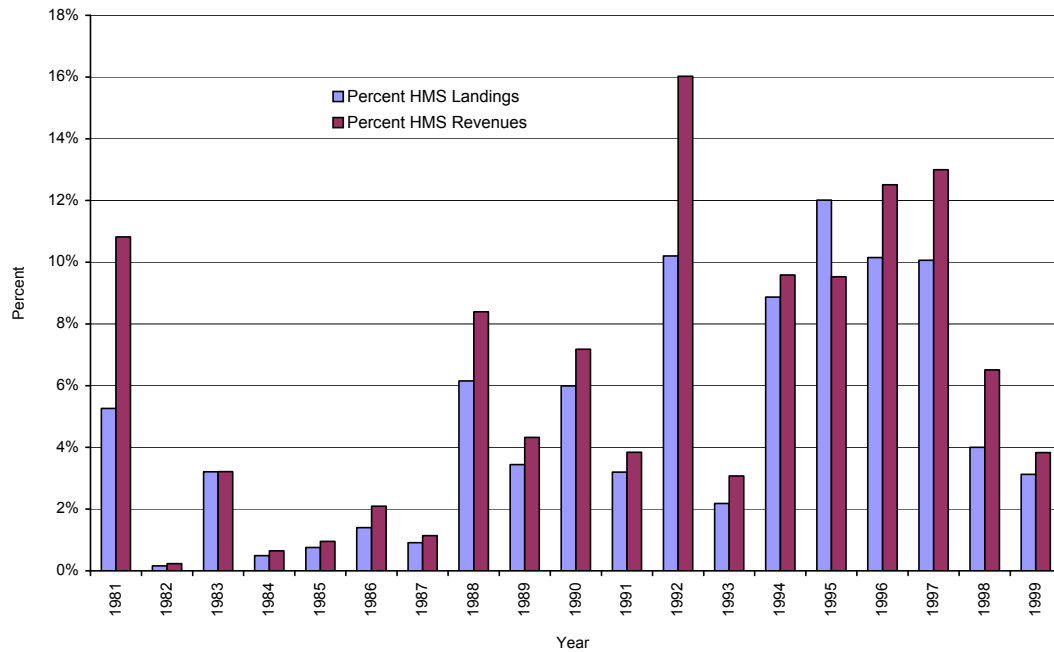
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Westport, WA, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	357	417						3,832
1982	338	13						4,442
1983	312	271						4,866
1984	170	33						4,728
1985	221	53						4,975
1986	224	85			56			7,659
1987	255	102			7			8,626
1988	327	977						10,685
1989	245	470						9,057
1990	309	698						7,498
1991	247	292						6,203
1992	321	1,218						7,885
1993	251	313						10,144
1994	244	1,090						7,562
1995	214	1,335						7,025
1996	238	2,093			2			14,391
1997	238	1,438						10,414
1998	146	624						7,522
1999	161	438						7,855
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	357	\$1,381,049						\$6,174,002
1982	338	\$29,379						\$7,473,747
1983	312	\$504,851			\$143			\$10,262,164
1984	170	\$61,557						\$6,445,932
1985	221	\$98,239						\$7,569,468
1986	224	\$130,797			\$200,957			\$11,937,621
1987	255	\$218,993			\$29,310			\$15,611,007
1988	327	\$2,365,530						\$18,305,333
1989	245	\$935,939						\$14,244,554
1990	309	\$1,511,913						\$13,706,447
1991	247	\$559,141			\$284			\$9,503,797
1992	321	\$3,270,612						\$12,673,467
1993	251	\$654,301			\$34			\$14,757,956
1994	244	\$2,143,027						\$14,226,181
1995	214	\$2,506,765			\$16			\$16,965,859
1996	238	\$3,996,402			\$6,455			\$19,481,458
1997	238	\$2,650,314			\$10			\$12,137,290
1998	146	\$840,610			\$131			\$8,420,963
1999	161	\$762,312						\$13,732,622

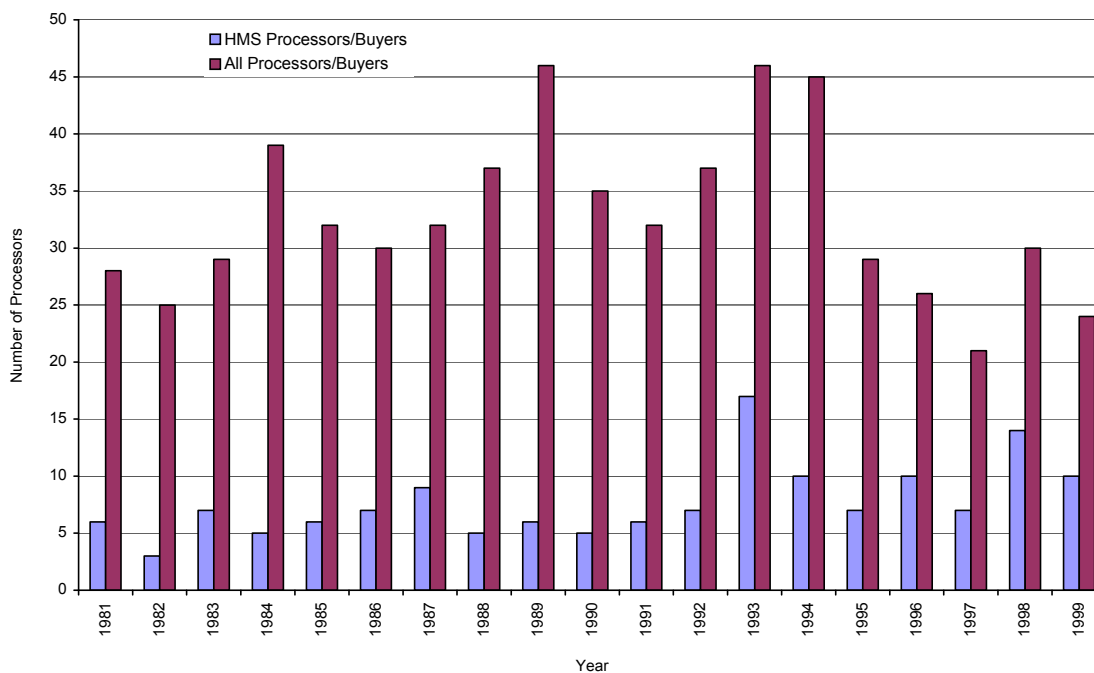
Proportion of vessels whose principal species is a HMS and whose principal port is Westport, WA of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in Westport, 1981-99.



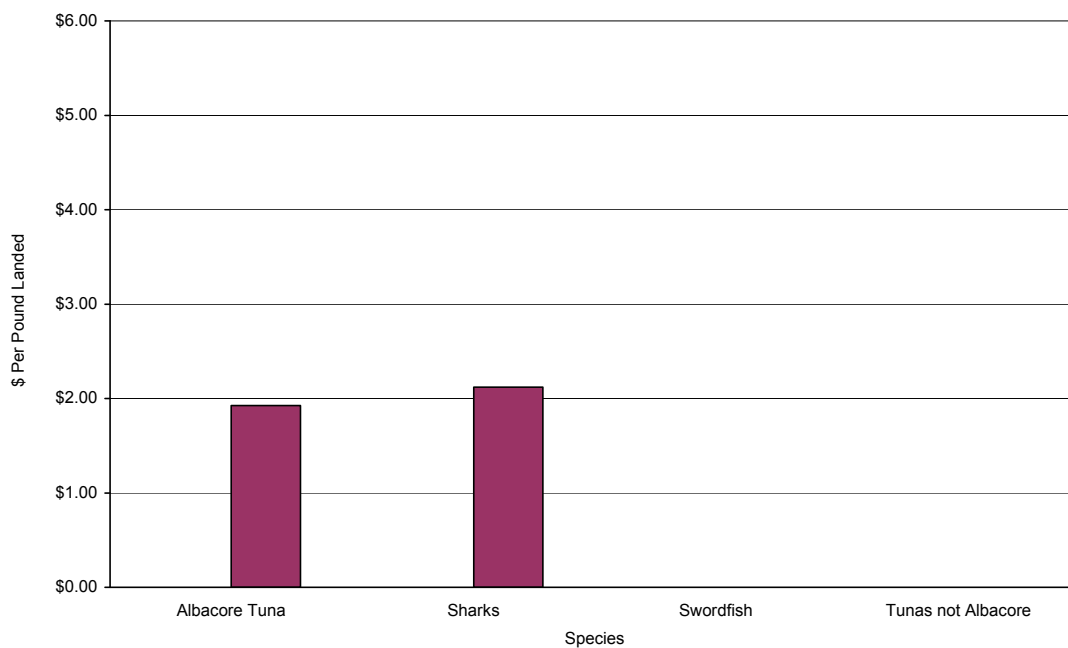
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Westport, WA, 1981-99.



Number of processors/buyers in Westport, WA 1981-99.



Total income multipliers for landings of HMS of species in the port of Westport, WA, based on 1996 landings and exvessel revenues.



A.4.3.2 HMS Community Profile: Ilwaco, Pacific County, WA

Pacific County and Ilwaco <http://www.visit.willapabay.org/>

Construction accounted for almost 28% of Pacific County's non-agricultural labor and proprietor income during 1999. Other key sectors in order of their relative contribution of labor and proprietor income in 1999 were wholesale trade, educational services and arts, entertainment and recreation. Agriculture is important to Pacific County's economy, in 1997 it accounted for 9% of labor and proprietor income. The community of Ilwaco is particularly dependent on crabbing, sports and commercial fishing, and seafood processing (including albacore).

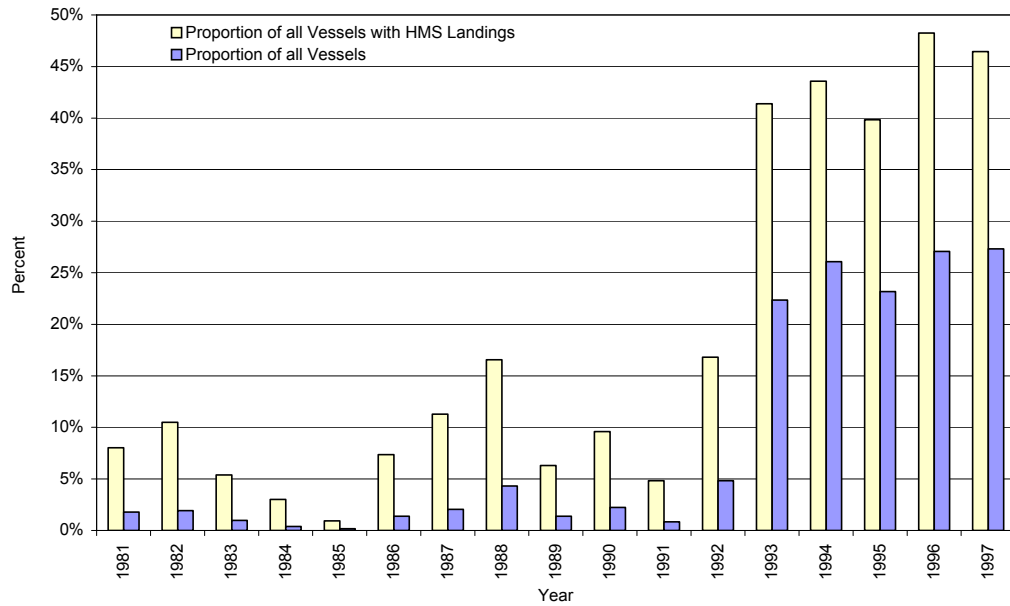
Number of vessels with HMS landings, for which Ilwaco, WA is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	17			0	0		28
1982	15			0	0		7
1983	8			0	0		15
1984	2			0	0		7
1985	1			0	0		6
1986	12			0	0		6
1987	13			2	0		12
1988	27			0	0		15
1989	9			0	1		13
1990	14			0	0		7
1991	4			0	0		3
1992	19			0	0		14
1993	71			0	1		13
1994	85			0	0		14
1995	51			0	0		9
1996	69			0	0		8
1997	59			0	0		13
1998	89			0	2		10
1999	63			0	0		19

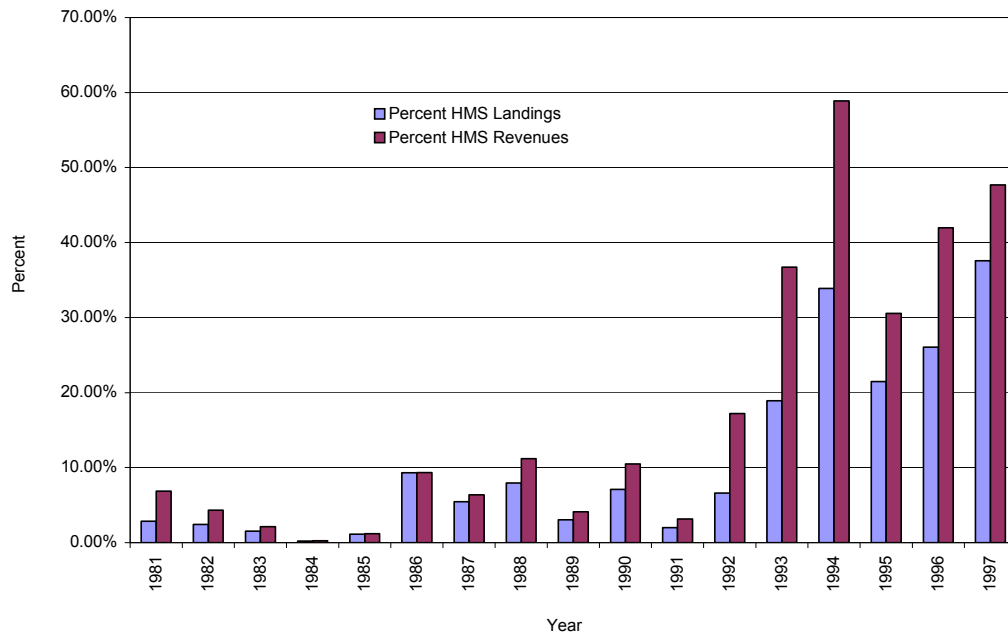
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Ilwaco, WA, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	212	263						4800
1982	143	165						3297
1983	148	75						2558
1984	66	10						2258
1985	107	69						3304
1986	163	747			26			2635
1987	133	409			58			2916
1988	163	846			6	2		4871
1989	159	328			3			6245
1990	146	432						2796
1991	83	106						2538
1992	113	515						4948
1993	174	1800						5531
1994	195	4056						5881
1995	128	1755			5			4117
1996	143	2828			2			2663
1997	127	2226			2			2400
1998	186	5518			6			1911
1999	144	1484			65	4		3337
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	212	\$878,737			\$14			\$5,547,534
1982	143	\$385,797			\$102			\$3,324,250
1983	148	\$143,147			\$58			\$3,325,327
1984	66	\$18,172			\$11			\$3,081,778
1985	107	\$103,465						\$4,403,550
1986	163	\$1,192,916			\$102,099			\$4,475,919
1987	133	\$898,906			\$268,820			\$5,901,841
1988	163	\$2,105,193			\$30,979	\$13,525		\$7,900,501
1989	159	\$668,022			\$10,542			\$9,849,670
1990	146	\$957,316			\$13			\$3,607,036
1991	83	\$200,287			\$4		\$17	\$2,589,412
1992	113	\$1,397,594			\$670		\$82	\$3,365,006
1993	174	\$3,823,298			\$953	\$5,907		\$3,382,539
1994	195	\$8,047,266						\$2,860,388
1995	128	\$3,305,459			\$16,542	\$328		\$3,283,161
1996	143	\$5,416,722			\$5,082			\$2,655,194
1997	127	\$4,147,241			\$10,720			\$2,141,654
1998	186	\$7,530,023			\$19,243			\$1,314,750
1999	144	\$2,608,971			\$143,960	\$9,445		\$1,941,164

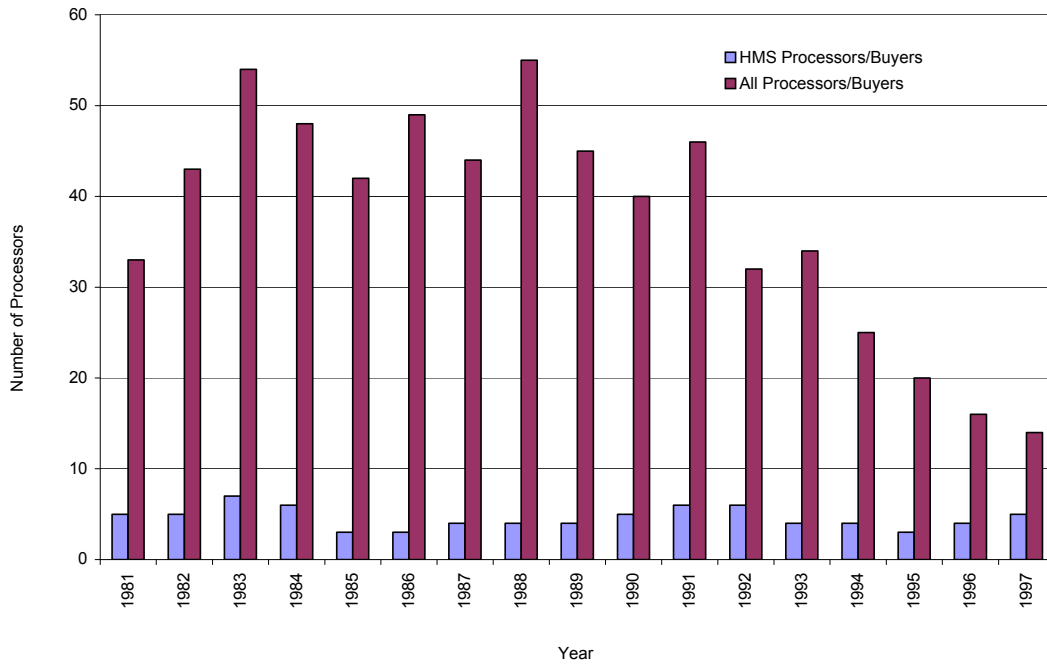
Proportion of vessels whose principal species is a HMS and whose principal port is Ilwaco, WA of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in Ilwaco, WA, 1981-99.



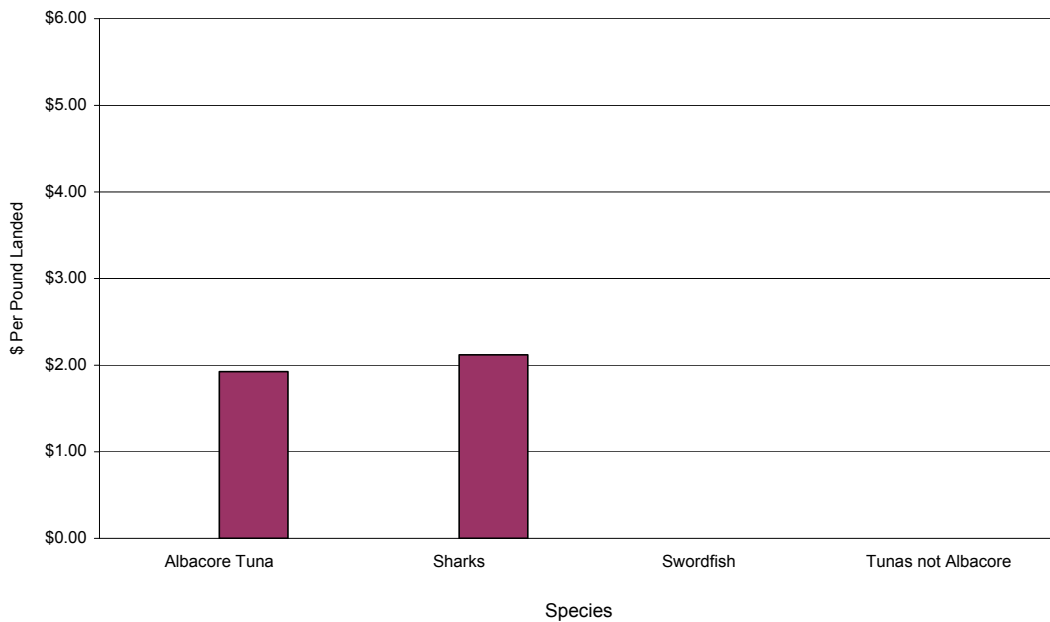
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Ilwaco, WA, 1981-99.



Number of processors/buyers in Ilwaco, WA, 1981-99.



Total income multipliers for landings of HMS of species in the port of Ilwaco, WA, based on 1996 landings and exvessel revenues.



Washington State HMS Communities Demographic and Economic Activity Summary

	County			
	Grays Harbor		Pacific	
	1990	2000	1990	2000
Population (numbers)	64,175	67,194	18,882	20,984
<i>Gender (Percent total population)</i>				
Male	49.8%	49.7%	49.4%	49.6%
Female	50.2%	50.3%	50.6%	50.4%
<i>Race and Hispanic origin (Percent total population)</i>				
White	93.9%	88.3%	93.7%	90.5%
Black	0.2%	0.3%	0.3%	0.2%
Native American	4.2%	4.7%	2.7%	2.4%
Asian or Pacific Islander	1.1%	1.3%	2.5%	2.2%
Other Race	0.7%	2.3%	0.8%	1.8%
Hispanic Origin (any race)	1.8%	4.8%	2.3%	5.0%
<i>Age Structure (Percent total population)</i>				
Under 5 years	7.3%	6.2%	6.4%	4.6%
5-9 Years	7.9%	6.8%	6.7%	5.4%
10-14 Years	7.6%	7.7%	6.6%	6.9%
15-19 Years	6.6%	7.7%	6.4%	6.8%
20-24 Years	5.5%	5.2%	4.1%	3.7%
25-34 Years	14.5%	11.3%	12.0%	8.4%
35-44 Years	15.0%	14.7%	13.7%	12.8%
45-54 Years	10.5%	14.7%	10.2%	15.1%
55-59 Years	4.5%	5.6%	5.4%	6.8%
60-64 Years	4.7%	4.7%	6.9%	6.9%
65-74 Years	8.8%	8.0%	12.9%	12.4%
75-84 Years	5.3%	5.6%	6.8%	7.8%
85 Years and greater	1.5%	1.8%	1.9%	2.4%
Median Age (years)	NA	38.8	NA	0.2%
18 Years and greater	73.0%	74.3%	75.9%	78.6%
Male	35.7%	36.5%	36.6%	38.4%
Female	37.3%	37.9%	39.3%	40.1%
21 Years and greater	69.4%	70.4%	73.0%	75.6%
62 Years and greater	18.8%	18.2%	25.9%	26.6%
65 Years and greater	15.9%	15.4%	21.5%	22.6%
Male	7.0%	6.9%	9.9%	10.6%
Female	8.9%	8.5%	11.7%	11.9%
<i>Educational Attainment (Persons 25 years and over)</i>				
Graduate or professional degree	2.1%	NA	2.0%	NA
Bachelor's degree	5.0%	NA	5.9%	NA
Associate's degree	4.6%	NA	3.7%	NA
Some college no degree	13.1%	NA	14.1%	NA
High school graduate	23.4%	NA	26.2%	NA
9th to 12th no diploma	11.6%	NA	11.5%	NA
Less than 9th grade	5.3%	NA	6.6%	NA
Economic Activity				
<i>Labor Force by Gender (Persons 16 years and over)</i>				
Males	42.0%	NA	39.4%	NA
Females	24.6%	NA	22.4%	NA
	17.4%	NA	17.0%	NA

Washington State HMS Communities Demographic and Economic Activity Summary

	County			
	Grays Harbor		Pacific	
	1993	1999	1993	1999
Economic Activity (Cont'd)				
<i>Employment (numbers)</i>				
Agricultural Services, Forestry, and Fishing (SIC-07)	292		233	
Fishing, hunting and trapping (SIC-0900)	23		75	
Mining (SIC-10)	45		41	
Construction (SIC-15)	819		163	
Manufacturing (SIC-20)	5,086		1,177	
Transportation and Public Utilities (SIC-40)	816		108	
Wholesale Trade (SIC-50)	745		76	
Retail Trade (SIC-52)	4,400		1,142	
Finance, Insurance, and Real Estate (SIC-60)	759		206	
Services (SIC-70)	4,414		1,233	
Unclassified Establishments (SIC-99)	10		0-19	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		1,285		259
Fishing (NAICS-11411)		12		20-99
Finfish fishing (NAICS-114111)		8		0-19
shellfish fishing (NAICS-114112)		4		59
Mining (NAICS-21)		0-19		0-19
Utilities (NAICS-22)		0-19		0-19
Construction (NAICS-23)		1,020		210
Manufacturing (NAICS-31)		3,368		769
Wholesale trade (NAICS-42)		578		110
Retail trade (NAICS-44)		3,021		640
Transportation & warehousing (NAICS-48)		477		20-99
Information (NAICS-51)		278		83
Finance & insurance (NAICS-52)		593		189
Real estate & rental & leasing (NAICS-53)		219		47
Professional, scientific & technical services (NAICS-54)		468		76
Management of companies & enterprises (NAICS-55)		0-19		0-19
Admin, support, waste mgt, remediation services (NAICS-56)		304		74
Educational services (NAICS-61)		26		20-99
Health care and social assistance (NAICS-62)		2,338		566
Arts, entertainment & recreation (NAICS-71)		149		65
Accommodation & food services (NAICS-72)		2,273		832
Other services (except public administration) (NAICS-81)		987		216
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		0-19		0-19
Unclassified establishments (NAICS-99)		13		5
<i>Labor and Proprietor Income (\$1,000)</i>				
Agricultural Services, Forestry, and Fishing (SIC-07)	5,885		2,269	
Fishing, hunting and trapping (SIC-0900)	344		1,272	
Mining (SIC-10)	378		971	
Construction (SIC-15)	22,710		2,602	
Manufacturing (SIC-20)	151,603		21,020	
Transportation And Public Utilities (SIC-40)	17,820		2,180	
Wholesale Trade (SIC-50)	17,025		1,712	
Retail Trade (SIC-52)	56,626		14,496	
Finance, Insurance, And Real Estate (SIC-60)	14,299		3,857	
Services (SIC-70)	73,855		15,424	
Unclassified Establishments (SIC-99)	121		11	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		49,890		5,975
Fishing (NAICS-11411)		584		-
Finfish fishing (NAICS-114111)		337		-
shellfish fishing (NAICS-114112)		247		1,246
Mining (NAICS-21)		-		-
Utilities (NAICS-22)		-		-
Construction (NAICS-23)		35,621		3,563
Manufacturing (NAICS-31)		135,072		19,877
Wholesale trade (NAICS-42)		16,875		1,756
Retail trade (NAICS-44)		59,919		10,946
Transportation & warehousing (NAICS-48)		13,921		-
Information (NAICS-51)		8,680		1,631
Finance & insurance (NAICS-52)		16,255		4,910
Real estate & rental & leasing (NAICS-53)		3,199		438
Professional, scientific & technical services (NAICS-54)		14,864		1,728
Management of companies & enterprises (NAICS-55)		-		-
Admin, support, waste mgt, remediation services (NAICS-56)		4,761		1,563

Washington State HMS Communities Demographic and Economic Activity Summary

	County			
	Grays Harbor		Pacific	
	1993	1999	1993	1999
Economic Activity (Cont'd)				
<i>Labor and Proprietor Income (\$1,000) (Cont'd)</i>				
Educational services (NAICS-61)		288		-
Health care and social assistance (NAICS-62)		59,194		12,002
Arts, entertainment & recreation (NAICS-71)		1,967		1,053
Accommodation & food services (NAICS-72)		23,954		8,937
Other services (except public administration) (NAICS-81)		12,844		2,556
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		-		-
Unclassified establishments (NAICS-99)		360		66
<i>Number of Establishments</i>				
Agricultural Services, Forestry, and Fishing (SIC-07)	55		28	
Fishing, hunting and trapping (SIC-0900)	15		12	
Mining (SIC-10)	4		5	
Construction (SIC-15)	185		77	
Manufacturing (SIC-20)	225		62	
Transportation And Public Utilities (SIC-40)	138		31	
Wholesale Trade (SIC-50)	83		15	
Retail Trade (SIC-52)	493		180	
Finance, Insurance, And Real Estate (SIC-60)	132		44	
Services (SIC-70)	582		180	
Unclassified Establishments (SIC-99)	16		4	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		128		40
Fishing (NAICS-11411)		15		15
Finfish fishing (NAICS-114111)		8		6
shellfish fishing (NAICS-114112)		7		9
Mining (NAICS-21)		1		2
Utilities (NAICS-22)		1		4
Construction (NAICS-23)		205		72
Manufacturing (NAICS-31)		99		34
Wholesale trade (NAICS-42)		61		14
Retail trade (NAICS-44)		319		116
Transportation & warehousing (NAICS-48)		105		15
Information (NAICS-51)		23		11
Finance & insurance (NAICS-52)		93		30
Real estate & rental & leasing (NAICS-53)		75		19
Professional, scientific & technical services (NAICS-54)		105		33
Management of companies & enterprises (NAICS-55)		2		1
Admin, support, waste mgt, remediation services (NAICS-56)		58		25
Educational services (NAICS-61)		8		3
Health care and social assistance (NAICS-62)		178		44
Arts, entertainment & recreation (NAICS-71)		31		19
Accommodation & food services (NAICS-72)		226		108
Other services (except public administration) (NAICS-81)		201		59
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		1		-
Unclassified establishments (NAICS-99)		25		16

Washington State HMS Communities Demographic and Economic Activity Summary

Major HMS Ports	Westport, Grays Co.		Illwaco, Pacific Co.	
	1990	2000	1990	2000
Population (numbers)	1,892	2,137	815	950
<i>Gender (Percent total population)</i>				
Male	50.9%	49.5%	49.6%	47.5%
Female	49.1%	50.5%	50.4%	52.5%
<i>Race and Hispanic origin (Percent total population)</i>				
White	96.9%	92.7%	96.2%	92.8%
Black	0.1%	0.3%	0.9%	0.5%
Native American	2.3%	3.1%	2.7%	1.4%
Asian or Pacific Islander	0.4%	1.0%	0.1%	0.5%
Other Race	0.3%	0.5%	0.1%	1.8%
Hispanic Origin (any race)	1.4%	3.0%	2.0%	5.3%
<i>Age Structure (Percent total population)</i>				
Under 5 years	6.9%	4.8%	7.4%	5.9%
5-9 Years	6.2%	6.0%	7.7%	7.4%
10-14 Years	6.2%	7.4%	6.1%	6.4%
15-19 Years	5.4%	6.1%	6.6%	6.7%
20-24 Years	6.3%	4.4%	4.3%	2.7%
25-34 Years	14.2%	9.4%	14.8%	11.6%
35-44 Years	12.9%	15.4%	14.5%	12.0%
45-54 Years	10.5%	14.6%	10.9%	16.1%
55-59 Years	5.6%	6.1%	4.4%	6.4%
60-64 Years	4.7%	6.6%	6.9%	4.7%
65-74 Years	14.5%	8.8%	8.3%	11.5%
75-84 Years	5.8%	8.3%	6.1%	6.0%
85 Years and greater	0.8%	2.0%	1.8%	2.5%
Median Age (Years)	NA	43.4	NA	43.0
18 Years and greater	77.4%	78.0%	74.6%	75.8%
Male	38.4%	37.3%	36.4%	34.4%
Female	39.0%	40.6%	38.2%	41.4%
21 Years and greater	74.3%	74.6%	71.3%	73.3%
62 Years and greater	23.8%	23.4%	20.6%	22.1%
65 Years and greater	21.1%	19.1%	16.3%	20.0%
Male	10.1%	0.9%	8.1%	7.9%
Female	11.0%	10.2%	8.2%	12.1%
Educational Attainment (Persons 25 years and over)				
Graduate or professional degree	1.3%	NA	5.4%	NA
Bachelor's degree	3.6%	NA	11.5%	NA
Associate's degree	3.1%	NA	3.3%	NA
Some college no degree	14.9%	NA	15.1%	NA
High school graduate	27.1%	NA	20.0%	NA
9th to 12th no diploma	15.0%	NA	7.6%	NA
Less than 9th grade	4.0%	NA	4.2%	NA
Economic Activity (Percent total population)				
<i>Labor Force by Gender (Persons 16 years and over)</i>				
	44.2%		39.1%	
Males	25.4%	NA	20.7%	NA
Females	18.8%	NA	18.4%	NA

Source: U.S. Bureau of Census

A.4.3.3 HMS Community Profile: Astoria, Clatsop County, OR

Clatsop County and Astoria

<http://www.olderoregon.com/>

In 1999, Clatsop County's agriculture support, forestry and fishing sector's contribution to employment and income was significant relative to that for the state, primarily due to commercial fishing. More than 50% of the county's non-agricultural labor and proprietor income was derived from the agriculture support, forestry and fishing sector, and the construction, manufacturing, health services, retail trade and tourism sectors.

The area of Astoria and Warrenton is a nationally significant historic region at the western end of the Lewis & Clark Trail. Astoria is the oldest American settlement west of the Rockies. Astoria is a city of 10,000 people on the Columbia River, just a few miles from the Pacific Ocean. It is surrounded by the beauty of the forest, mountains, 3 rivers and the sea. The area has a strong Scandinavian heritage.

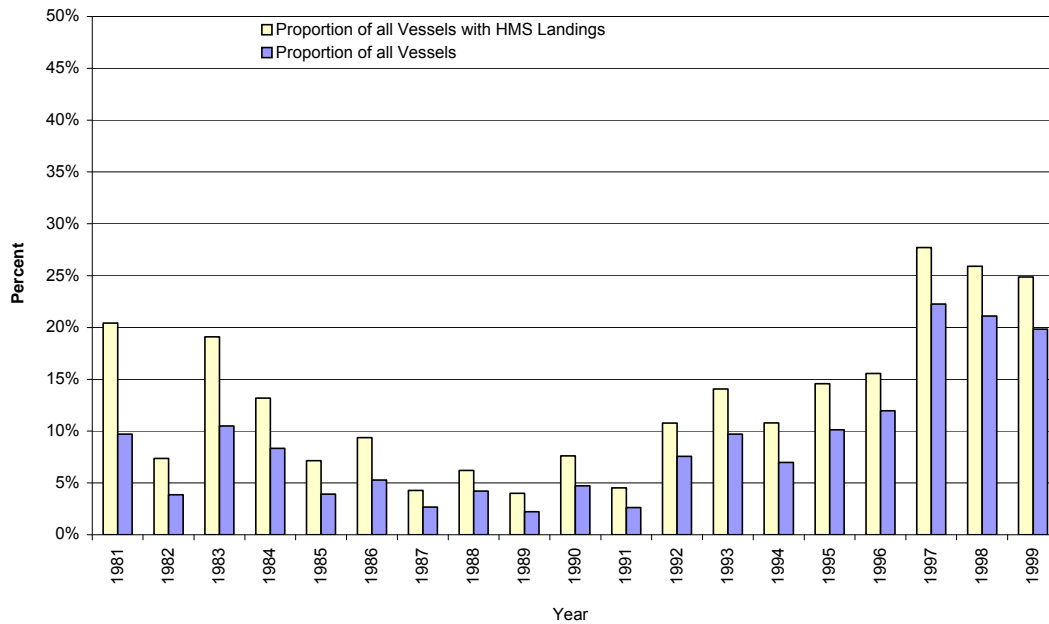
Number of vessels with HMS landings, for which Astoria, OR is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	76				0		30
1982	21				0		11
1983	55				0		15
1984	24				0		10
1985	13				0		4
1986	20				1		1
1987	9				1		6
1988	11				1		5
1989	8				0		3
1990	16				0		4
1991	8				0		5
1992	21				0		30
1993	26				0		18
1994	15				0		13
1995	22				0		14
1996	27				1		19
1997	58				1		45
1998	49				1		28
1999	46				1		20

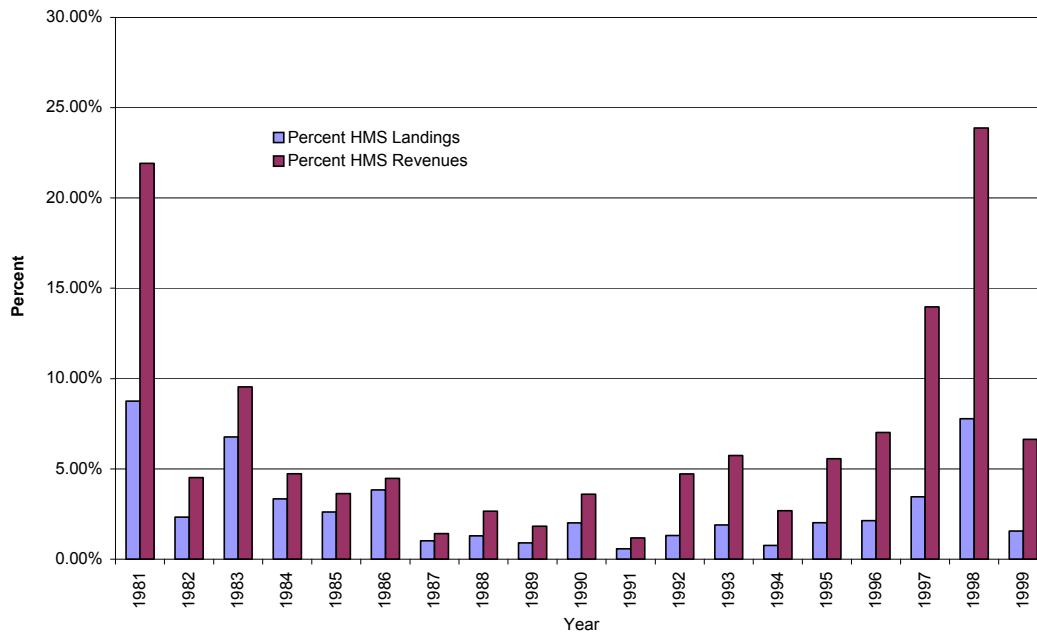
Number of vessels making HMS landings, and HMS landings (mt) and Exvessel revenues (1999 \$) by species group, Astoria, OR, 1981-99.

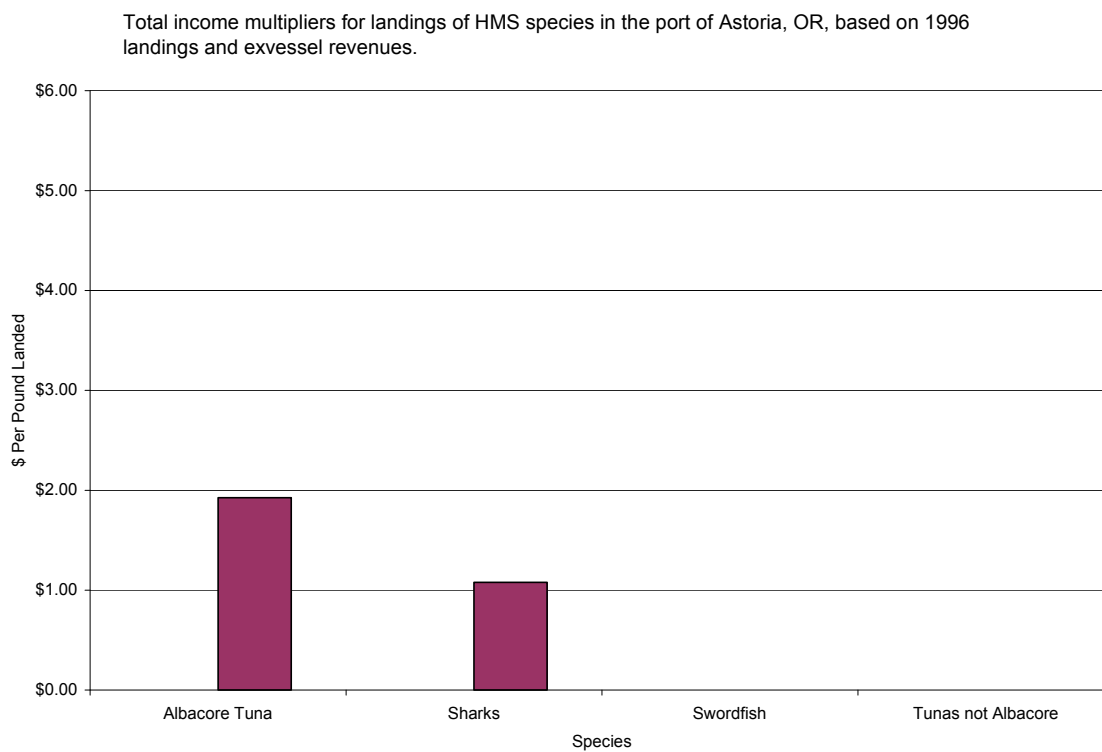
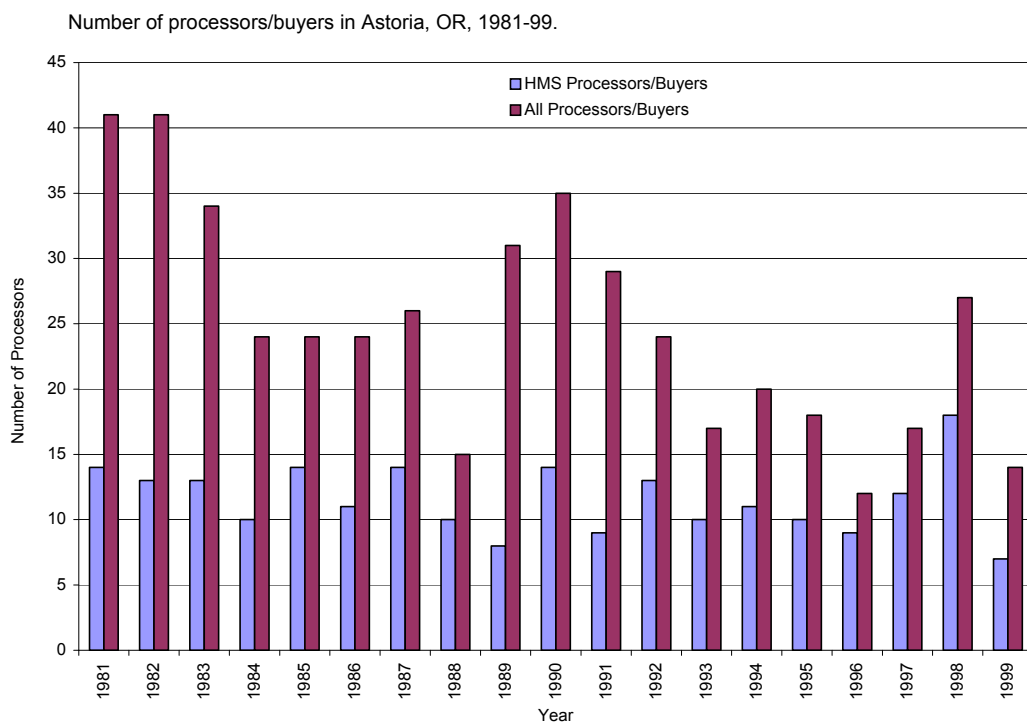
Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	372	1825						7096
1982	285	331						6562
1983	288	879						6582
1984	182	350						6022
1985	182	302						7705
1986	224	646						12333
1987	234	216						16418
1988	193	248						14616
1989	200	201						15991
1990	210	375						12959
1991	177	117						16154
1992	195	398						25916
1993	185	588						25937
1994	139	274						32786
1995	151	820				1		36279
1996	180	1024						39986
1997	213	1799						43112
1998	193	3081				13		32308
1999	189	823	5			6		48871
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	372	\$6,051,906						\$9,021,603
1982	285	\$804,975					\$397	\$8,676,437
1983	288	\$1,685,103					\$97	\$8,476,571
1984	182	\$603,288					\$277	\$7,249,509
1985	182	\$508,533						\$9,137,173
1986	224	\$1,075,927					\$177	\$17,023,326
1987	234	\$491,007	\$9					\$26,711,024
1988	193	\$621,159						\$16,812,366
1989	200	\$459,598						\$17,133,742
1990	210	\$821,700						\$14,887,013
1991	177	\$243,300						\$15,377,002
1992	195	\$1,046,659						\$16,219,066
1993	185	\$1,246,581						\$15,301,210
1994	139	\$546,914						\$15,821,208
1995	151	\$1,539,679	\$250	\$22		\$14,703	\$46	\$20,943,768
1996	180	\$1,986,331	\$44					\$20,952,465
1997	213	\$3,302,838	\$1,385	\$116		\$4,163	\$79	\$16,414,557
1998	193	\$4,277,148	\$5,222			\$111,492		\$11,610,305
1999	189	\$1,465,834	\$29,215			\$45,114	\$198	\$17,689,198

Proportion of vessels whose principal species is a HMS and whose principal port is Astoria, OR of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in Astoria, 1981-99.



Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Astoria, OR, 1981-99.





A.4.3.4 HMS Community Profile: Newport, Lincoln County OR

Lincoln County and Newport

<http://www.newportchamber.org/economic/home.cfm>

In Lincoln County, commercial fishing helps make the agriculture support, forestry and fishing sector's contribution to the economy significantly greater than that for the state. In 1999, 62% of the non-agricultural labor and proprietor income was derived from the manufacturing, retail trade, health services and tourism sectors of the Lincoln County economy.

Newport is situated in the central region of Lincoln County which consists of the cities of Depoe Bay, Lincoln City, Newport, Siletz, Toledo, Waldport and Yachats, and the communities of Chitwood, Seal Rock and Tidewater.

Newport, the county seat of Lincoln County, is the business center of the county. Most commercial/retail development is on the bayfront and along Highway 101, which bisects the city. Newport is a transportation hub, with state highway routes to the north, south, and east, an airport, and an excellent port.

As the largest and most diversified business community in Lincoln County, Newport draws its workforce not only from Newport, but from all over Lincoln County. Lincoln County's civilian workforce of almost 22,000 people is composed of skilled, productive individuals, with approximately 45% of the workforce having an education level higher than high school.

The early economy of Newport grew as a result of fishing, timber and tourism. The current elements in the economic base of Newport and Lincoln County are tourism and recreation, fishing and seafood processing, forest products, forest management, ocean research, manufacturing, agriculture, government and retirement income. Newport's employment is largely in the trade and services sector, as tourism represents the largest portion of the City's economy.

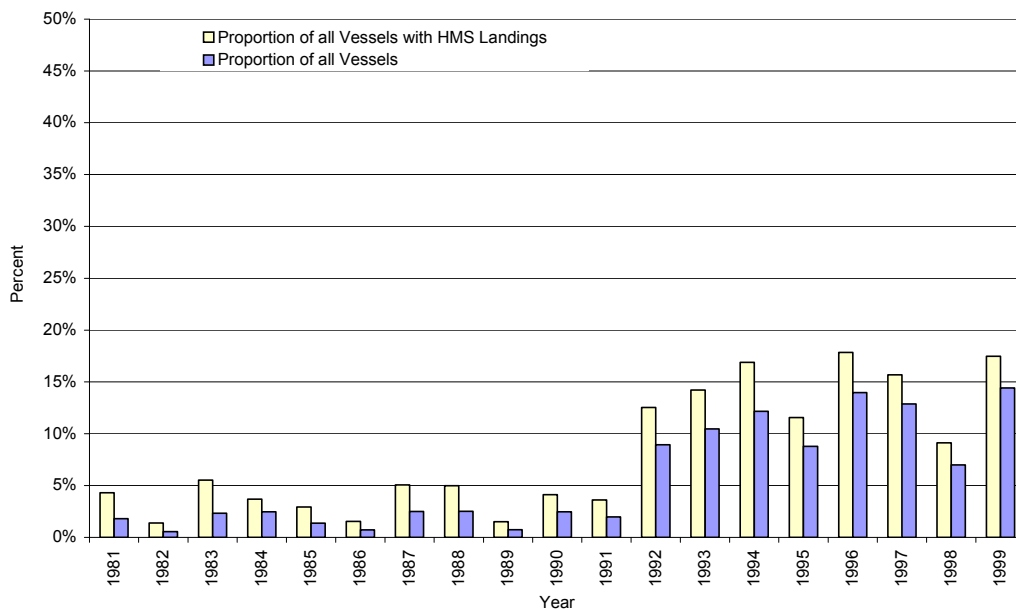
Number of vessels with HMS landings, for which Newport, OR is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	20				0		86
1982	5				0		33
1983	23				1		63
1984	9				0		43
1985	8				1		15
1986	6				0		17
1987	22				0		37
1988	23				1		79
1989	6				0		28
1990	14				0		36
1991	12				0		13
1992	49				1		107
1993	53				0		77
1994	50				0		65
1995	38				0		41
1996	65				1		62
1997	55				1		102
1998	25				1		85
1999	50				0		59

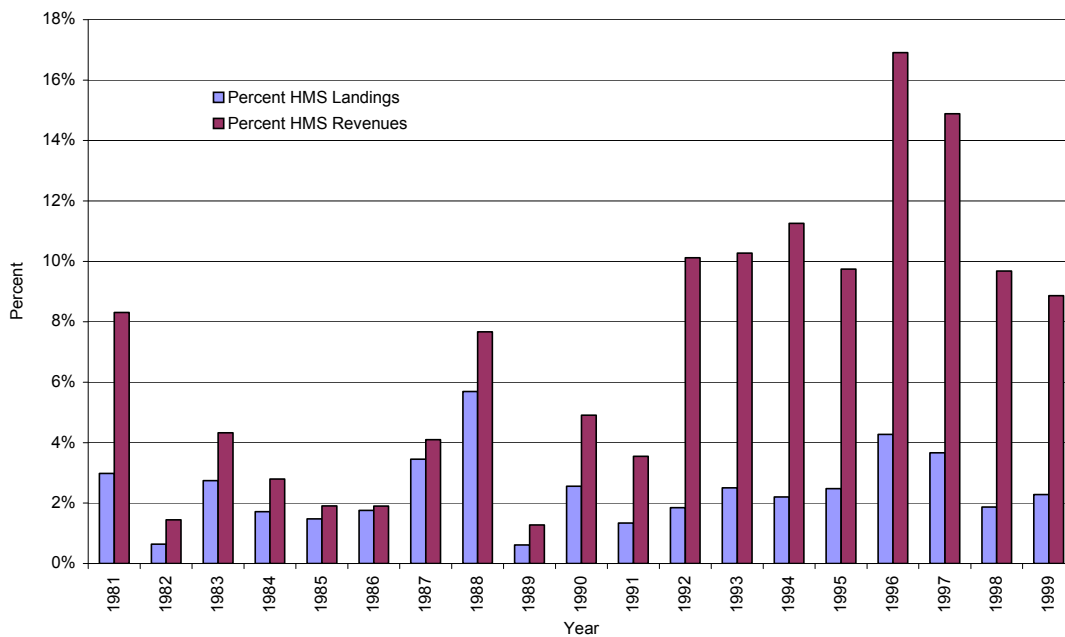
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Newport, OR, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	465	633						10039
1982	361	139						10019
1983	435	379						9031
1984	244	201						7979
1985	307	197						10192
1986	390	213						9296
1987	435	563						12452
1988	483	1031						13760
1989	398	121						16342
1990	340	394						12131
1991	333	316						15343
1992	399	1038						44856
1993	373	1013						28761
1994	296	1223						38187
1995	329	1264				1		39201
1996	370	2214				15		33078
1997	357	1785				5		32289
1998	285	981				15		40343
1999	286	956	1					26993
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	465	\$2,104,804						\$14,283,907
1982	361	\$336,156						\$14,118,987
1983	435	\$711,883					\$1	\$11,799,353
1984	244	\$379,265						\$9,981,803
1985	307	\$367,141						\$15,302,390
1986	390	\$368,686						\$15,495,220
1987	435	\$1,247,439						\$23,910,549
1988	483	\$2,521,475						\$24,118,953
1989	398	\$310,684						\$20,212,369
1990	340	\$919,395						\$15,413,774
1991	333	\$611,103						\$13,776,948
1992	399	\$2,651,531						\$20,606,193
1993	373	\$1,914,723						\$14,110,810
1994	296	\$2,345,580						\$15,749,468
1995	329	\$2,384,098	\$203			\$10,439	\$299	\$19,956,663
1996	370	\$4,222,351	\$1,059			\$115,470	\$7	\$18,617,049
1997	357	\$3,188,854	\$1,947			\$47,628		\$16,456,102
1998	285	\$1,274,902	\$4,186			\$116,357		\$12,076,284
1999	286	\$1,730,631	\$8,902			\$1,841		\$15,898,712

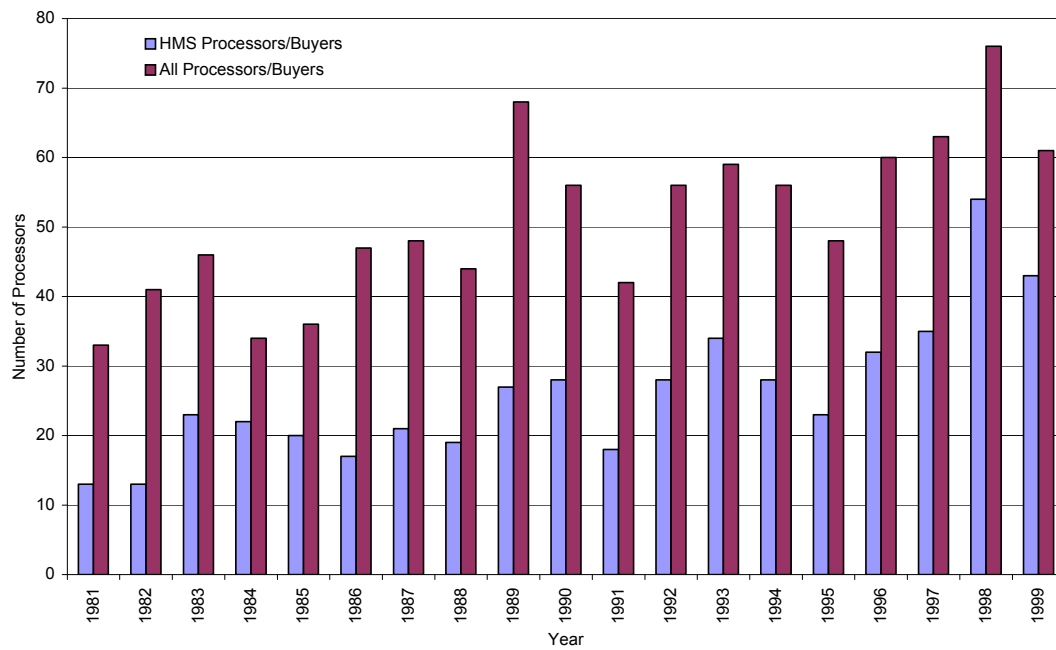
Proportion of vessels whose principal species is a HMS and whose principal port is Newport, OR of all vessels making HMS landings, and the proportion of these vessel of the total number of vessels making landings in Newport, 1981-99.



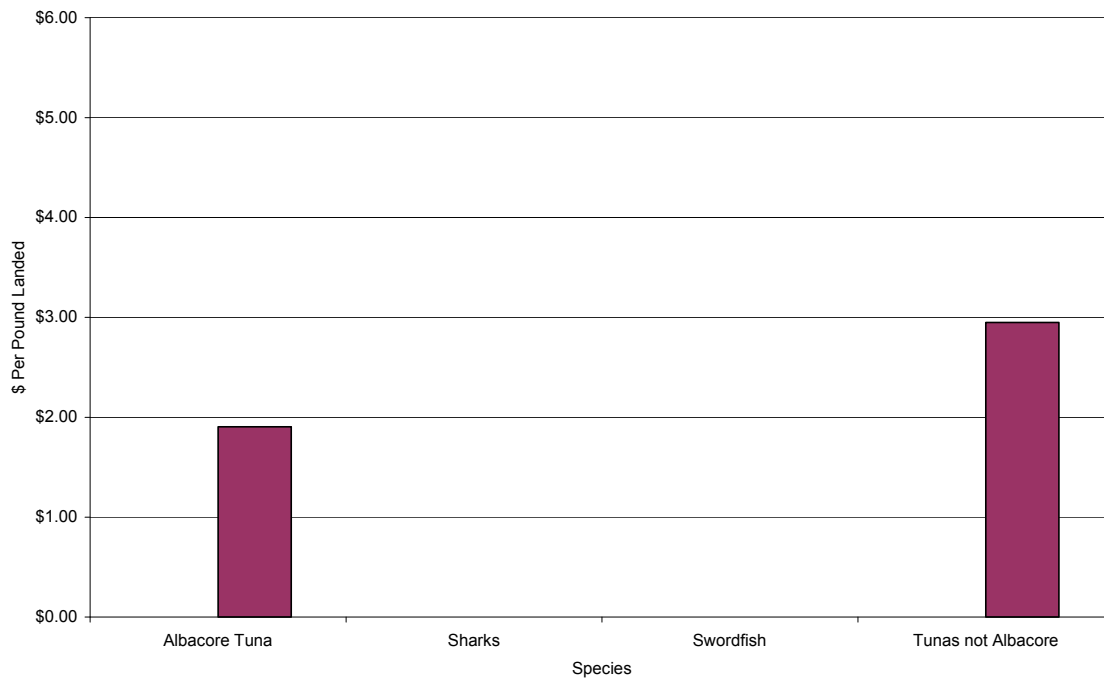
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Newport, Or, 1981-99.



Number of processors/buyers in Newport, OR, 1981-99.



Total income multipliers for landings of HMS species in the port of Newport, OR, based on 1996 landings and exvessel revenues.



A.4.3.5 HMS Community Profile: Coos Bay, Coos County OR

Coos County and Coos Bay

<http://www.ucinet.com/~bacc/index.html>

Coos County's economic structure reflects the seaport activities of Coos Bay. These activities are evident in the transportation sector which historically has generated a larger proportion of non-agricultural labor and proprietor income in the county than in the state and most other Oregon counties. In 1999, the major sectors of the County's economy in terms of proprietor and labor income were forestry, fishing and agriculture support, as well as manufacturing, retail trade, transportation and health services.

Coos Bay, Oregon's largest bay, has represented a commercial passage to the sea from pioneer days to the present. The name is derived from one of the area's Native American tribes and has two Indian meanings --lake and place of pines.

Coos Bay is the largest of the communities that comprise Oregon's Bay Area. The city, founded in the 1850s, was named Marshfield after the Massachusetts home town of the city's founder J. C. Tolman, and was incorporated in 1874 under that name. In 1944, residents voted to change the name to Coos Bay.

Historically, wood products, commercial fishing and shipping have been the mainstays of the Bay Area's economy; more recently, agriculture and tourism have become increasingly important segments.

Coos County boasts 722 farms, comprising 17% of its total land area. More than 10,200 acres are irrigated, and average farm size is 242 acres.

The county ranked first in Oregon in cranberry production, with about 1,450 acres harvested in 1997. Sheep production ranked fourth highest, and dairy production ninth highest in the state during 1997.

The 1997 estimated gross value of all crops, including small woodlots, was \$38.5 million, and \$22.4 million for all livestock. Agricultural employment averages 500, according to the most recent estimate available from the Oregon Employment Department.

During 1997, over 33.9 million pounds of seafood were landed along the south coast of Oregon, with a value of over \$21 million to local fishers; annual values tend to fluctuate due to environmental constraints and management policies. Most of the seafood products from Coos County and its south coast neighbor, Curry County, are either sold fresh or frozen in U.S. markets, or are exported to Europe and Japan. The majority of processing is done on the south coast, bringing additional dollars into the area. Another positive impact on the local economy comes from the service industry in marine repair, fabrication and other services.

Groundfish lead in value of all seafood products landed, followed closely by shrimp, crab, urchins and salmon, although the near total loss of commercial ocean salmon has reduced its income by over 90%. Smaller harvests from albacore and miscellaneous species also contribute to the income. Coos County is first in the state for oyster production.

There are approximately 610,000 acres of non-federal forest lands in Coos County, with 16% owned by Coos County and the State of Oregon, 23% owned by small woodland owners, and the remaining 61% owned by wood products corporations.

The value of timber harvested from non-federal lands as it leaves the Coos County forests reaches \$113.5 million. Production facilities in the Bay Area include a containerboard mill which utilizes 100% recycled materials and an automated sawmill which opened in 1994. Another \$1.5 million comes from the harvest of floral greenery and forest seedling nurseries annually. Approximately 1,700 Coos County residents are employed in the lumber and wood products industry.

Tourism ranks as an increasingly important segment of the Bay Area's economy. In addition to the many cultural and recreational attractions and events, area motels, restaurants and other businesses benefit from a variety of conferences, conventions and other meetings which are held in the community annually. New facilities, attractions, recreational activities and beautification projects are in the planning stages to make the area even more attractive to new and returning visitors. Estimated employment in the Bay Area's visitor industry is 800.

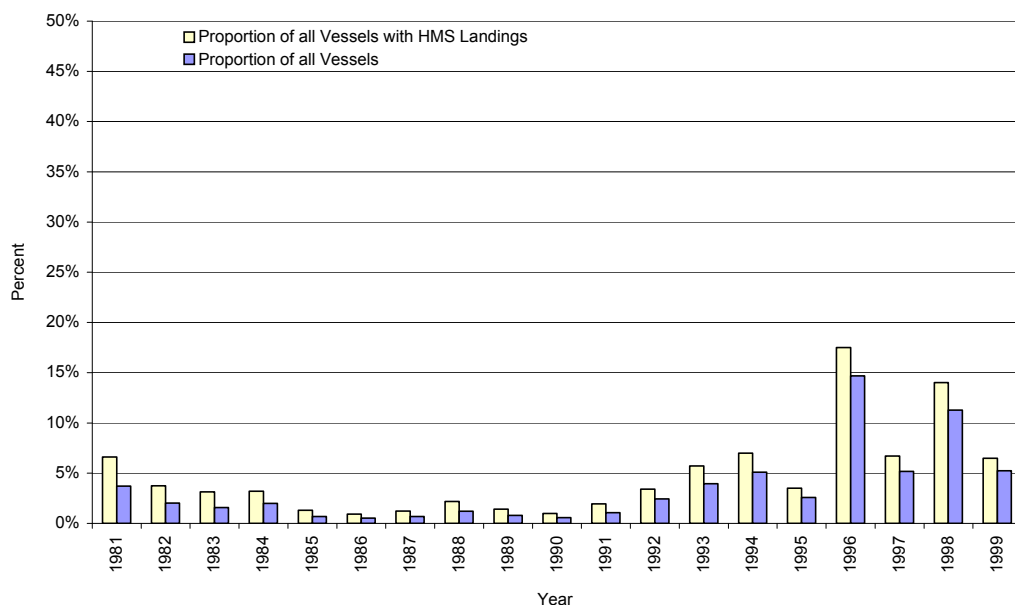
Number of vessels with HMS landings, for which Coos Bay, OR is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	35						105
1982	19						22
1983	12						38
1984	7						7
1985	5						2
1986	4						6
1987	6						16
1988	11						17
1989	7						13
1990	4						38
1991	5						5
1992	7						30
1993	14						28
1994	14						22
1995	7						18
1996	42						29
1997	12						51
1998	23						40
1999	14						13

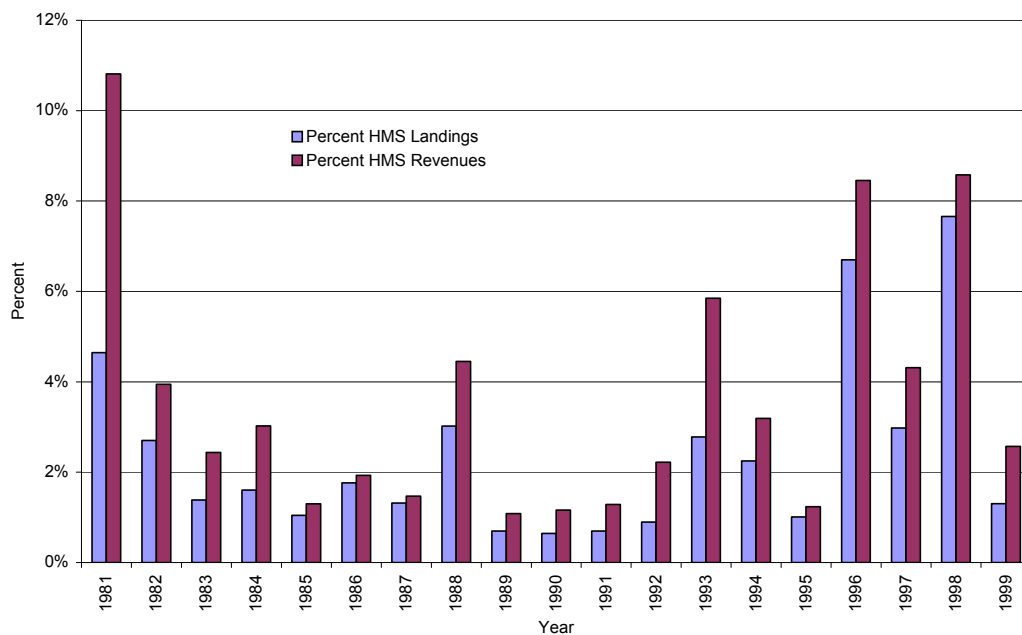
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Coos Bay, OR, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	530	810						9860
1982	508	369						9296
1983	381	165						9089
1984	219	146						7522
1985	380	121						9829
1986	432	195						9198
1987	491	177						12043
1988	504	430						12641
1989	497	111						14226
1990	407	93						13372
1991	259	94						13031
1992	206	156						16492
1993	245	364						12134
1994	200	245						9905
1995	200	99						9398
1996	240	680				1		8746
1997	179	291						8466
1998	164	503				4		5748
1999	216	153						11052
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	530	\$2,695,422						\$14,014,554
1982	508	\$860,386						\$15,206,768
1983	381	\$318,757					\$33	\$9,998,074
1984	219	\$291,756						\$7,794,166
1985	380	\$200,657						\$12,517,783
1986	432	\$331,775						\$14,064,152
1987	491	\$389,762						\$22,439,873
1988	504	\$1,063,284						\$18,758,676
1989	497	\$223,486						\$17,324,785
1990	407	\$225,982						\$17,151,251
1991	259	\$196,747						\$14,384,937
1992	206	\$389,231						\$16,230,022
1993	245	\$742,121						\$11,242,284
1994	200	\$466,269						\$12,941,597
1995	200	\$195,552						\$14,834,331
1996	240	\$1,294,863	\$100			\$9,950		\$13,188,019
1997	179	\$539,383		\$108			\$880	\$10,827,481
1998	164	\$698,014				\$22,529		\$7,292,550
1999	216	\$304,093						\$10,853,904

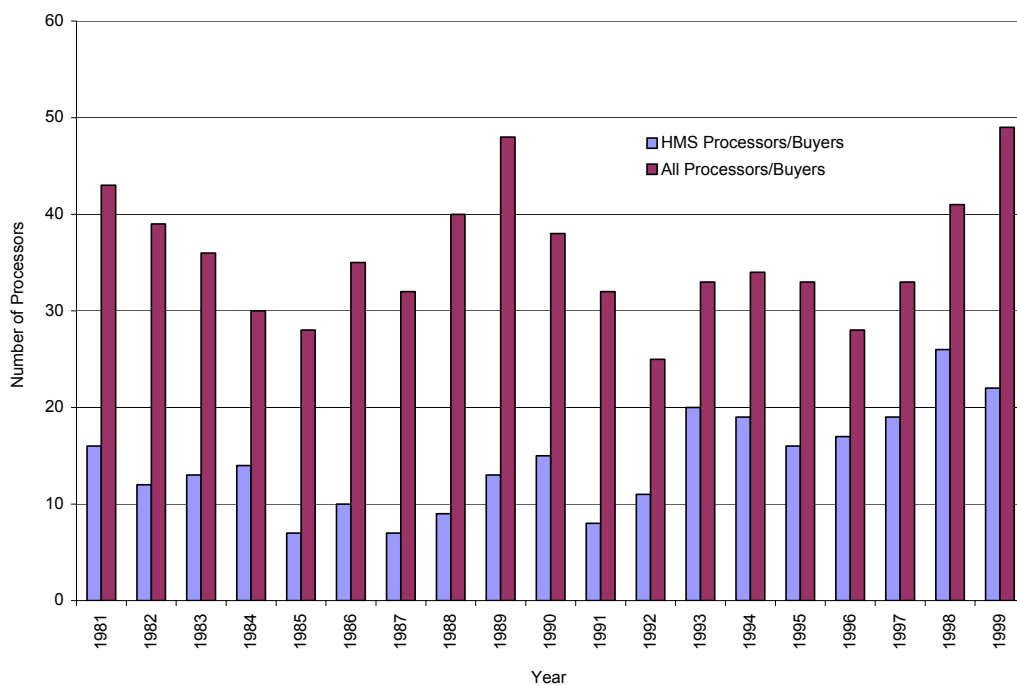
Proportion of vessels whose principal species is a HMS and whose principal port is Coos Bay, OR of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in Coos Bay, 1981-99.



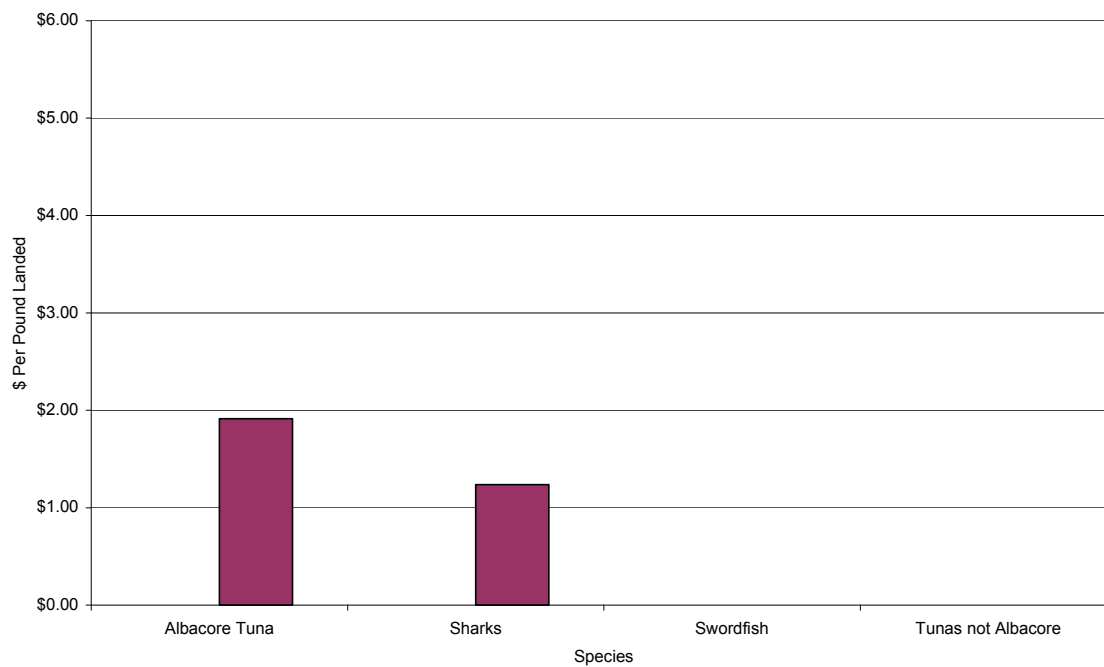
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Westport, OR, 1981-99.



Number of processors/buyers in Coos Bay, OR, 1981-99.



Total income multipliers for landings of HMS species in the port of Coos Bay, OR, based on 1996 landings and exvessel revenues.



Oregon State HMS Communities Demographic and Economic Activity Summary

	County					
	Clatsop		Lincoln		Coos	
	1990	2000	1990	2000	1990	2000
Population (numbers)	33,301	35,630	38,889	44,479	60,273	62,779
<i>Gender (Percent total population)</i>						
Male	49.7%	49.5%	48.2%	48.5%	49.4%	49.0%
Female	50.3%	50.5%	51.8%	51.5%	50.6%	51.0%
<i>Race and Hispanic origin (Percent total population)</i>						
White	96.4%	93.1%	96.1%	90.6%	95.9%	92.0%
Black	0.3%	0.5%	0.2%	0.3%	0.2%	0.3%
Native American	1.1%	1.0%	2.4%	3.1%	2.3%	2.4%
Asian or Pacific Islander	1.3%	1.4%	0.9%	1.1%	1.0%	1.1%
Other Race	0.8%	1.6%	0.4%	1.7%	0.6%	1.1%
Hispanic Origin (any race)	1.9%	4.5%	1.5%	4.8%	2.2%	3.4%
<i>Age Structure (Percent total population)</i>						
Under 5 years	6.9%	5.6%	6.1%	4.9%	6.4%	4.9%
5-9 Years	7.4%	6.1%	7.1%	5.5%	7.3%	5.7%
10-14 Years	7.3%	7.1%	6.7%	6.7%	7.3%	6.9%
15-19 Years	6.7%	7.9%	5.1%	6.6%	6.3%	7.1%
20-24 Years	5.6%	5.6%	4.2%	4.3%	4.9%	4.5%
25-34 Years	14.5%	10.5%	12.9%	9.4%	13.7%	9.6%
35-44 Years	16.0%	14.7%	16.0%	14.1%	14.9%	14.4%
45-54 Years	10.2%	16.4%	10.3%	16.7%	11.3%	15.8%
55-59 Years	4.4%	5.6%	5.2%	6.5%	5.1%	6.4%
60-64 Years	4.8%	4.7%	6.3%	5.8%	5.5%	5.7%
65-74 Years	9.2%	8.0%	12.7%	10.7%	10.3%	10.0%
75-84 Years	5.5%	5.6%	6.0%	6.9%	5.6%	6.7%
85 Years and greater	1.5%	2.0%	1.3%	1.9%	1.4%	2.4%
Median Age (years)	NA	40	NA	44.1	NA	43.1
18 Years and greater	74.3%	76.3%	76.7%	78.6%	74.9%	78.1%
Male	36.2%	37.2%	36.3%	37.2%	36.4%	37.8%
Female	38.1%	39.1%	40.3%	41.3%	38.5%	40.3%
21 Years and greater	70.4%	71.7%	74.1%	75.4%	76.7%	74.4%
62 Years and greater	19.1%	18.3%	24.0%	23.0%	20.6%	22.5%
65 Years and greater	16.2%	15.6%	20.1%	19.5%	17.3%	19.1%
Male	7.0%	6.8%	9.1%	8.6%	7.9%	8.7%
Female	9.3%	8.8%	10.9%	11.0%	9.4%	10.4%
<i>Educational Attainment (Persons 25 years and over)</i>						
Graduate or professional degree	3.7%	NA	4.4%	NA	2.7%	NA
Bachelor's degree	7.3%	NA	7.3%	NA	5.7%	NA
Associate's degree	4.6%	NA	3.4%	NA	4.7%	NA
Some college no degree	17.6%	NA	17.6%	NA	16.0%	NA
High school graduate	21.0%	NA	24.1%	NA	22.3%	NA
9th to 12th no diploma	8.2%	NA	10.0%	NA	11.4%	NA
Less than 9th grade	3.8%	NA	3.8%	NA	5.3%	NA
<i>Labor Force by Gender (Persons 16 years and over)</i>						
Males	47.7%	NA	45.0%	NA	43.1%	NA
Females	26.7%	NA	24.1%	NA	24.0%	NA
	21.0%	NA	20.9%	NA	19.0%	NA
Economic Activity						
<i>Employment (numbers)</i>						
Agricultural Services, Forestry, and Fishing (SIC-07)	103		129		394	
Fishing, hunting and trapping (SIC-0900)	46		42		13	
Mining (SIC-10)	0-19		47		76	
Construction (SIC-15)	456		753		606	
Manufacturing (SIC-20)	1,728		1,334		3,301	
Transportation and Public Utilities (SIC-40)	332		383		1,319	
Wholesale Trade (SIC-50)	463		288		777	
Retail Trade (SIC-52)	3,608		4,511		4,767	
Finance, Insurance, and Real Estate (SIC-60)	409		670		666	
Services (SIC-70)	3,029		3,444		4,605	
Unclassified Establishments (SIC-99)	0-19		15		5	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		478		241		1,004
Fishing (NAICS-11411)		20-99		49		0-19
Finfish fishing (NAICS-114111)		53		31		0-19
shellfish fishing (NAICS-114112)		0-19		18		0-19

Oregon State HMS Communities Demographic and Economic Activity Summary

	County					
	Clatsop		Lincoln		Coos	
	1993	1999	1993	1999	1993	1999
Economic Activity						
<i>Employment (numbers)</i>						
Mining (NAICS-21)		0-19		20-99		20-99
Utilities (NAICS-22)		69		20-99		20-99
Construction (NAICS-23)		775		678		744
Manufacturing (NAICS-31)		985		982		1,577
Wholesale trade (NAICS-42)		282		188		674
Retail trade (NAICS-44)		2,351		2,751		3,082
Transportation & warehousing (NAICS-48)		192		200		873
Information (NAICS-51)		183		226		353
Finance & insurance (NAICS-52)		252		349		534
Real estate & rental & leasing (NAICS-53)		200		170		243
Professional, scientific & technical services (NAICS-54)		279		328		505
Management of companies & enterprises (NAICS-55)		92		24		94
Admin, support, waste mgt, remediation services (NAICS-56)		216		683		1,180
Educational services (NAICS-61)		148		79		70
Health care and social assistance (NAICS-62)		1,440		1,656		3,048
Arts, entertainment & recreation (NAICS-71)		202		1,017		467
Accommodation & food services (NAICS-72)		2,276		3,341		1,921
Other services (except public administration) (NAICS-81)		585		588		665
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		0-19		7		0-19
Unclassified establishments (NAICS-99)		0-19		0-19		20-99
<i>Labor and Proprietor Income (\$1,000)</i>						
Agricultural Services, Forestry, and Fishing (SIC-07)	1,425		2,822		8,723	
Fishing, hunting and trapping (SIC-0900)	628		1,077		215	
Mining (SIC-10)	0		1,145		2,090	
Construction (SIC-15)	10,414		13,508		14,772	
Manufacturing (SIC-20)	32,952		42,129		77,478	
Transportation and Public Utilities (SIC-40)	9,626		9,599		33,821	
Wholesale Trade (SIC-50)	10,345		5,722		18,787	
Retail Trade (SIC-52)	44,159		53,573		59,401	
Finance, Insurance, and Real Estate (SIC-60)	7,131		12,254		14,607	
Services (SIC-70)	47,756		49,978		82,375	
Unclassified Establishments (SIC-99)	0		129		94	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		15,456		6,357		29,767
Fishing (NAICS-11411)		0		1,563		0
Finfish fishing (NAICS-114111)		494		1,165		0
shellfish fishing (NAICS-114112)		0		398		0
Mining (NAICS-21)		0		0		0
Utilities (NAICS-22)		2,946		0		0
Construction (NAICS-23)		19,065		16,514		23,184
Manufacturing (NAICS-31)		22,445		41,571		53,680
Wholesale trade (NAICS-42)		7,795		5,540		20,052
Retail trade (NAICS-44)		41,060		47,291		52,826
Transportation & warehousing (NAICS-48)		7,772		4,623		28,159
Information (NAICS-51)		4,811		5,521		9,711
Finance & insurance (NAICS-52)		6,903		10,836		16,222
Real estate & rental & leasing (NAICS-53)		3,275		3,280		4,291
Professional, scientific & technical services (NAICS-54)		5,564		6,578		12,028
Management of companies & enterprises (NAICS-55)		1,970		951		2,566
Admin, support, waste mgt, remediation services (NAICS-56)		4,522		9,761		16,730
Educational services (NAICS-61)		3,073		1,118		1,029
Health care and social assistance (NAICS-62)		37,528		41,290		78,378
Arts, entertainment & recreation (NAICS-71)		3,769		21,870		7,279
Accommodation & food services (NAICS-72)		30,580		41,663		19,593
Other services (except public administration) (NAICS-81)		8,038		9,335		10,569
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		0		310		0
Unclassified establishments (NAICS-99)		0		0		0

Oregon State HMS Communities Demographic and Economic Activity Summary

	County					
	Clatsop		Lincoln		Coos	
	1993	1999	1993	1999	1993	1999
Economic Activity (cont'd)						
<i>Number of Establishments</i>						
Agricultural Services, Forestry, and Fishing (SIC-07)	38		52		43	
Fishing, hunting and trapping (SIC-0900)	20		26		9	
Mining (SIC-10)	2		5		7	
Construction (SIC-15)	123		197		143	
Manufacturing (SIC-20)	77		75		219	
Transportation and Public Utilities (SIC-40)	64		63		117	
Wholesale Trade (SIC-50)	59		57		88	
Retail Trade (SIC-52)	406		485		454	
Finance, Insurance, and Real Estate (SIC-60)	86		127		121	
Services (SIC-70)	365		446		532	
Unclassified Establishments (SIC-99)	14		12		15	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		70		72		109
Fishing (NAICS-11411)		36		44		8
Finfish fishing (NAICS-114111)		29		30		6
shellfish fishing (NAICS-114112)		7		14		1
Mining (NAICS-21)		1		3		6
Utilities (NAICS-22)		11		4		3
Construction (NAICS-23)		156		187		158
Manufacturing (NAICS-31)		49		59		94
Wholesale trade (NAICS-42)		38		37		61
Retail trade (NAICS-44)		260		347		279
Transportation & warehousing (NAICS-48)		49		45		81
Information (NAICS-51)		24		23		29
Finance & insurance (NAICS-52)		39		55		76
Real estate & rental & leasing (NAICS-53)		55		80		64
Professional, scientific & technical services (NAICS-54)		65		92		116
Management of companies & enterprises (NAICS-55)		5		5		6
Admin, support, waste mgt, remediation services (NAICS-56)		40		63		63
Educational services (NAICS-61)		13		19		6
Health care and social assistance (NAICS-62)		106		118		200
Arts, entertainment & recreation (NAICS-71)		20		37		22
Accommodation & food services (NAICS-72)		199		254		174
Other services (except public administration) (NAICS-81)		117		135		146
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		1		3		3
Unclassified establishments (NAICS-99)		28		25		34

Oregon State HMS Communities Demographic and Economic Activity Summary

Major HMS Ports	Astoria, Clatsop Co.		Newport, Lincoln Co.		Coos Bay, Coos Co.	
	1990	2000	1990	2000	1990	2000
Population (numbers)	10,069	9,813	8,437	9,532	15,076	15,374
<i>Gender (Percent total population)</i>						
Male	48.7%	48.0%	47.6%	48.9%	48.2%	48.5%
Female	51.3%	52.0%	52.4%	51.1%	51.8%	51.5%
<i>Race and Hispanic origin (Percent total population)</i>						
White	95.5%	91.1%	95.9%	88.6%	94.8%	90.8%
Black	0.3%	0.5%	0.3%	0.5%	0.3%	0.4%
Native American	1.4%	1.1%	1.9%	2.2%	2.5%	2.3%
Asian or Pacific Islander	2.1%	2.1%	1.4%	1.9%	1.6%	1.7%
Other Race	0.7%	2.7%	0.5%	3.9%	0.9%	1.3%
Hispanic Origin (any race)	2.5%	6.0%	2.0%	9.0%	2.7%	4.5%
<i>Age Structure (Percent total population)</i>						
Under 5 years	7.8%	6.4%	6.7%	5.6%	7.0%	5.7%
5-9 Years	7.5%	6.1%	7.4%	5.9%	7.3%	6.0%
10-14 Years	6.7%	7.2%	6.5%	6.3%	6.7%	6.7%
15-19 Years	6.1%	7.1%	5.6%	7.0%	6.3%	7.6%
20-24 Years	6.5%	6.3%	5.6%	5.6%	5.8%	5.7%
25-34 Years	16.1%	12.3%	14.9%	11.7%	14.5%	11.1%
35-44 Years	15.2%	14.1%	17.5%	14.0%	14.8%	14.1%
45-54 Years	9.2%	15.7%	9.8%	16.1%	10.1%	13.6%
55-59 Years	4.0%	5.0%	4.7%	5.8%	4.4%	5.4%
60-64 Years	4.4%	3.7%	4.9%	4.8%	5.4%	4.9%
65-74 Years	8.8%	7.4%	9.7%	9.0%	10.2%	9.3%
75-84 Years	5.7%	6.0%	5.5%	6.5%	5.9%	7.3%
85 Years and greater	2.1%	2.5%	1.4%	1.8%	1.6%	2.6%
Median Age (Years)	NA	38.3	NA	40.9	NA	40.1
18 Years and greater	74.6%	76.0%	75.7%	77.7%	75.2%	77.4%
Male	35.7%	36.0%	35.5%	37.2%	35.6%	36.6%
Female	38.8%	40.0%	40.3%	40.5%	39.6%	40.6%
21 Years and greater	70.7%	71.8%	72.9%	74.2%	71.6%	72.5%
62 Years and greater	19.3%	18.1%	19.7%	20.1%	21.0%	22.1%
65 Years and greater	16.6%	15.9%	16.6%	17.2%	17.7%	19.2%
Male	6.7%	6.3%	7.0%	7.3%	7.7%	8.4%
Female	9.9%	9.6%	9.6%	9.9%	10.0%	10.8%
Educational Attainment (Persons 25 years and over)						
Graduate or professional degree	3.9%	NA	5.1%	NA	3.1%	NA
Bachelor's degree	6.9%	NA	8.5%	NA	6.2%	NA
Associate's degree	4.4%	NA	4.6%	NA	4.4%	NA
Some college no degree	17.9%	NA	18.3%	NA	17.2%	NA
High school graduate	20.9%	NA	20.9%	NA	20.9%	NA
9th to 12th no diploma	7.5%	NA	8.2%	NA	10.5%	NA
Less than 9th grade	4.3%	NA	2.7%	NA	5.1%	NA
Economic Activity (Percent total population)						
<i>Labor Force by Gender (Persons 16 years and over)</i>						
Males	47.8%	NA	49.8%	NA	45.8%	NA
Females	27.4%	NA	25.4%	NA	25.1%	NA
	20.3%	NA	24.4%	NA	20.7%	NA

Source: U.S. Bureau of Census

A.4.3.6 HMS Community Profile: Crescent City, Del Norte County, CA

Del Norte County and Crescent City

<http://www.crescentcity.org/>

The economic contribution of Del Norte County's government sector, which includes Pelican Bay prison, has typically been more than twice the state average, and accounts for the major share of the County's labor income. Other important sectors of the County's 1999 economy included forestry, fishing and agriculture support, as well as manufacturing, retail trade and tourism. Agriculture is also important to the Del Norte County economy, with 12% of the County's total labor and proprietor income derived from agriculture in 1997.

Crescent City is one of the oldest incorporated cities in California and the only incorporated city in Del Norte County. The town was laid out in 1852 along the harbor and coastline and was the first county seat of the former Klamath County. In 1855, the state legislature considered moving the state capital to Crescent City, but the bill to do so failed. Two years later, the legislature divided Klamath County, forming the new Del Norte County. Crescent City is the county seat. The city has a large harbor, a downtown area, highway frontage and several shopping districts.

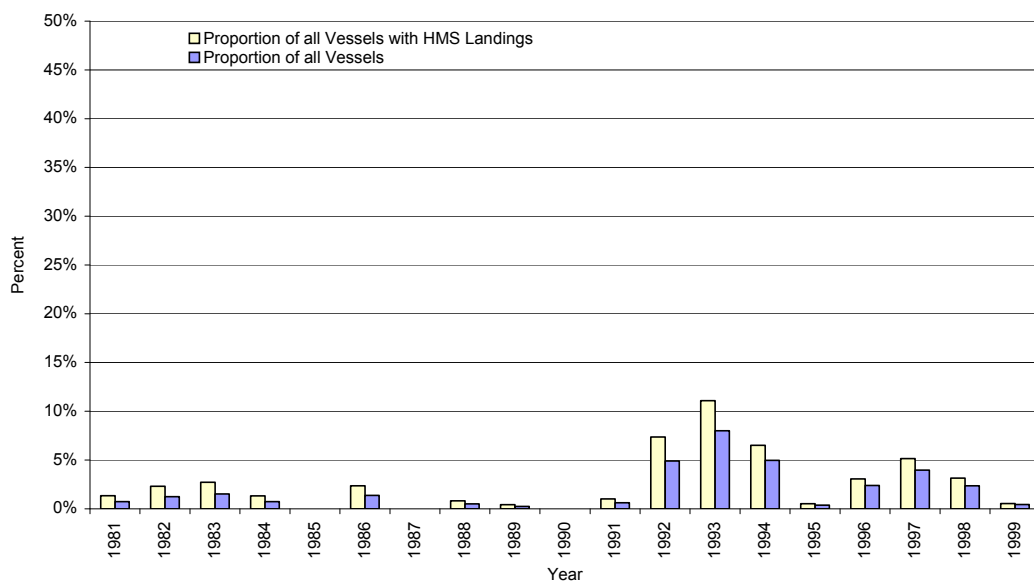
Number of vessels with HMS landings for which the Crescent City, CA area is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	8			0	0		69
1982	13			0	0		16
1983	12			0	0		95
1984	4			0	0		24
1985							19
1986	7			0	0		14
1987							12
1988	2			0	0		21
1989	1			0	0		9
1990							17
1991	0			0	2		7
1992	2			0	15		21
1993	2			0	28		37
1994	7			1	12		73
1995	1			0	0		16
1996	6			0	1		49
1997	9			0	2		58
1998	1			0	5		23
1999	1			0	0		16

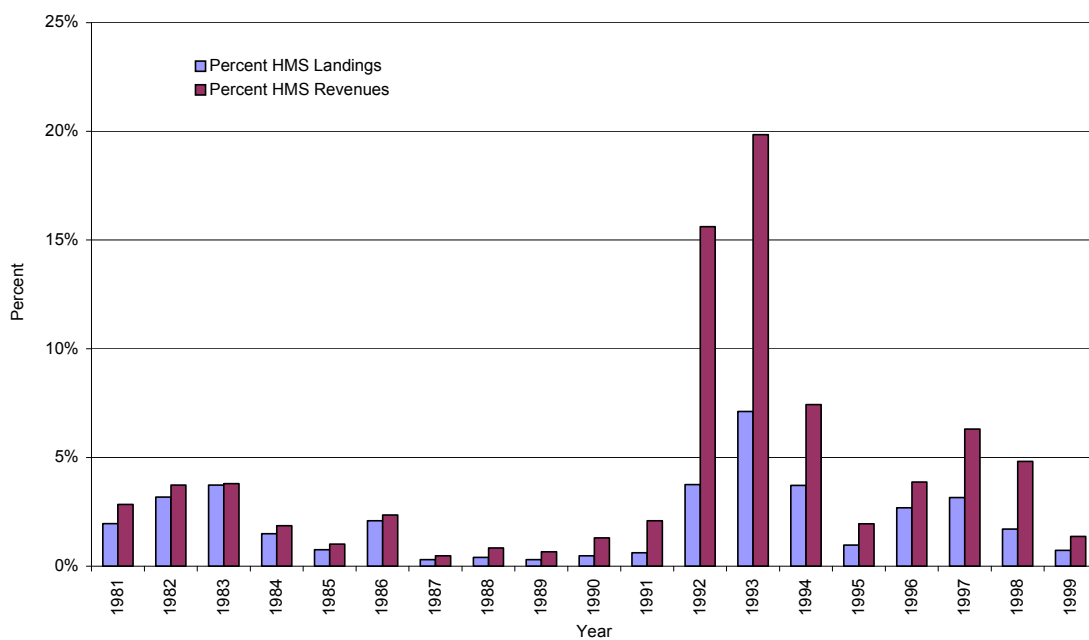
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Crescent City, CA, 1981-99.

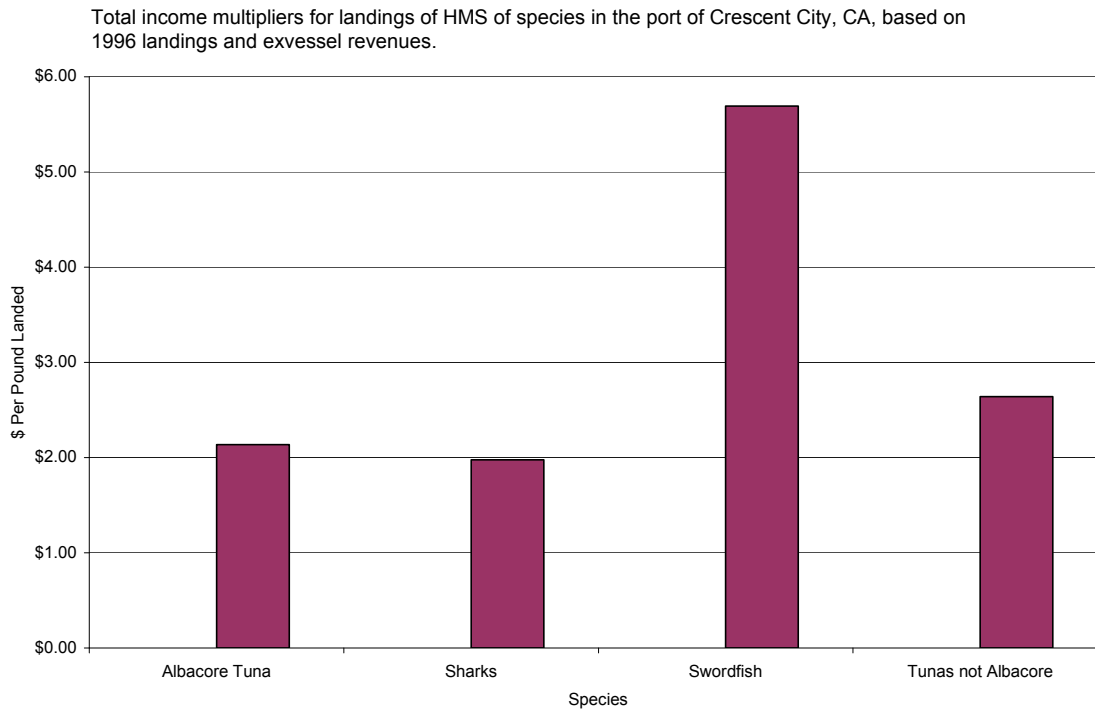
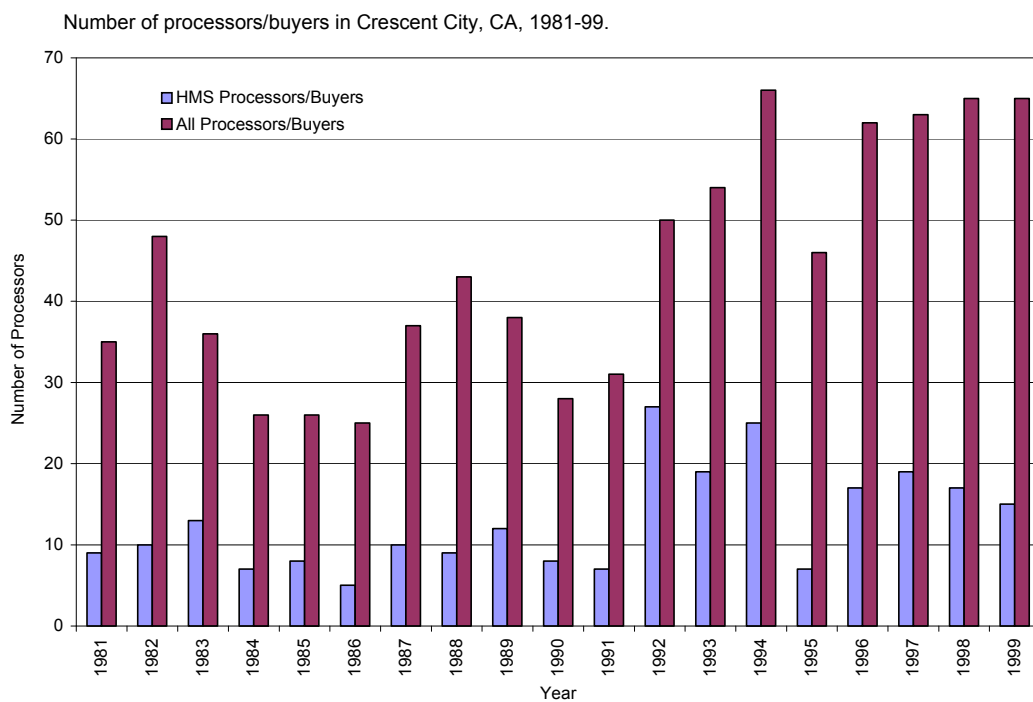
Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	589	172						6611
1982	566	309						7345
1983	442	251						5402
1984	303	108						6076
1985	211	68			2			7743
1986	296	224						8324
1987	275	22			10			8656
1988	249	68						14189
1989	247	39			14			14611
1990	187	11			29	27		12014
1991	195	2			52	30		12181
1992	231	96			61	516	1	15100
1993	271	239	5		86	559	3	10310
1994	307	335	15		18	120		11513
1995	193	77	1		2	16		6456
1996	228	293	2		2	23		8890
1997	214	430	3		7	29		9933
1998	190	55	5		23	93		7642
1999	185	29			2	17		4415
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	589	\$573,286						\$15,767,137
1982	566	\$705,306			\$304		\$148	\$14,846,863
1983	442	\$490,604			\$958			\$10,481,673
1984	303	\$197,612			\$34			\$8,691,307
1985	211	\$119,187			\$4,626			\$10,229,000
1986	296	\$399,438			\$124	\$4,834	\$6	\$13,821,395
1987	275	\$53,026			\$26,256			\$13,851,533
1988	249	\$177,464			\$127			\$17,363,803
1989	247	\$75,769			\$35,859			\$12,828,383
1990	187	\$24,790			\$46,371	\$167,105		\$14,839,241
1991	195	\$4,825			\$66,770	\$200,740		\$10,740,561
1992	231	\$333,666	\$2,850		\$101,914	\$2,559,090	\$7,487	\$13,432,066
1993	271	\$395,661	\$22,100		\$136,919	\$2,826,937	\$19,517	\$11,510,630
1994	307	\$644,126	\$88,912	\$4,169	\$36,292	\$725,819		\$16,280,989
1995	193	\$148,600	\$7,088		\$2,595	\$82,802		\$10,286,959
1996	228	\$540,433	\$7,573		\$4,008	\$132,078		\$14,385,578
1997	214	\$752,902	\$12,881		\$12,061	\$150,846	\$231	\$11,575,237
1998	190	\$82,476	\$29,379		\$34,162	\$395,535	\$262	\$8,858,153
1999	185	\$69,013	\$7,466		\$3,080	\$79,038	\$1,597	\$9,631,439

Proportion of vessels whose principal species is a HMS and whose principal port is Crescent City, CA of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in Crescent City, 1981-99.



Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Crescent City, CA, 1981-99.





A.4.3.7 HMS Community Profile: Eureka, Humboldt County, CA

Humboldt County and Eureka

<http://www.eurekawebs.com/>

Almost 55% of Del Norte County's non-agriculture labor and proprietor income in 1999 was generated by the manufacturing, retail trade and health care sectors of the economy. Forestry, fishing and agriculture support, as well as construction and tourism were other important components of the County's economy.

Founded in 1856, Eureka is bordered on one side by Humboldt Bay, and on the other by mountains lush with redwoods which offer a reminder of the area's rich logging heritage. The community's roots since the 1850's have been in the timber and commercial fishing industries.

Eureka is continuing to successfully transition to a broader economic base, and today enjoys its position as the governmental, commercial, industrial and transportation center of the region. The city's 28,600 residents reside within the 17 square miles of the City limits which also serves as the County seat for Humboldt County. Eureka functions more like a city twice its size due to its regional center status and the fact its service area population is about 50,000.

The Eureka/Humboldt County economy has historically depended heavily on the timber industry, which included lumber production and the manufacturing of timber-related products. Both types of manufacturing are in long-term decline due to diminishing timber resources, increased mechanization, and increased regulation of timber harvesting. Since the 1970s, there has been a major shift in the structure of the county's economy away from manufacturing toward services, retail trade, and government. However, job growth since 1991 has been in (1) services other than medical or lodging, (2) retail and restaurants, (3) medical services, (4) finance, insurance and real estate, (5) food and fish processing, and (6) other manufacturing. Humboldt State University, as well as some state and federal government employers, are also basic industries. Spending by visitors and the movement of retired persons into the county have provided some basic economic activity more recently. Basic industries generate demand for other industries to provide supplies. The railroad and port, for example, historically served the timber industry. Local-serving industries are those that serve the consumption needs of the local area.

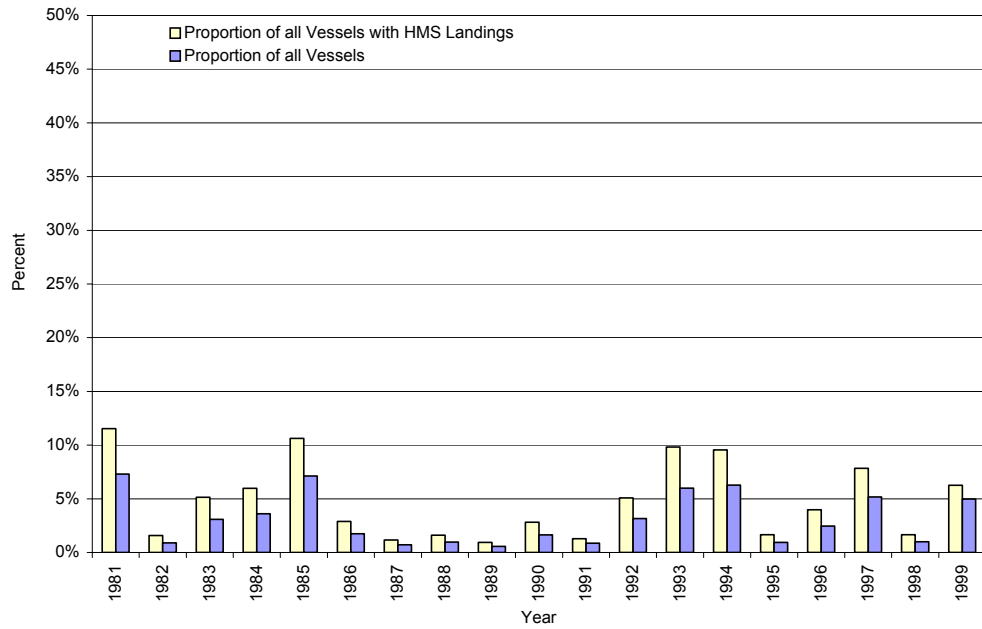
Number of vessels with HMS landings, for which the Eureka, CA area is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	63				0		53
1982	6				0		14
1983	16				0		62
1984	15				0		23
1985	24				0		33
1986	8				0		6
1987	3				0		12
1988	4				0		18
1989	2				0		5
1990	5				0		8
1991	3				0		3
1992	6				3		16
1993	16				0		19
1994	17				0		31
1995	2				0		11
1996	6				0		15
1997	12				0		28
1998	2				0		10
1999	9				0		19

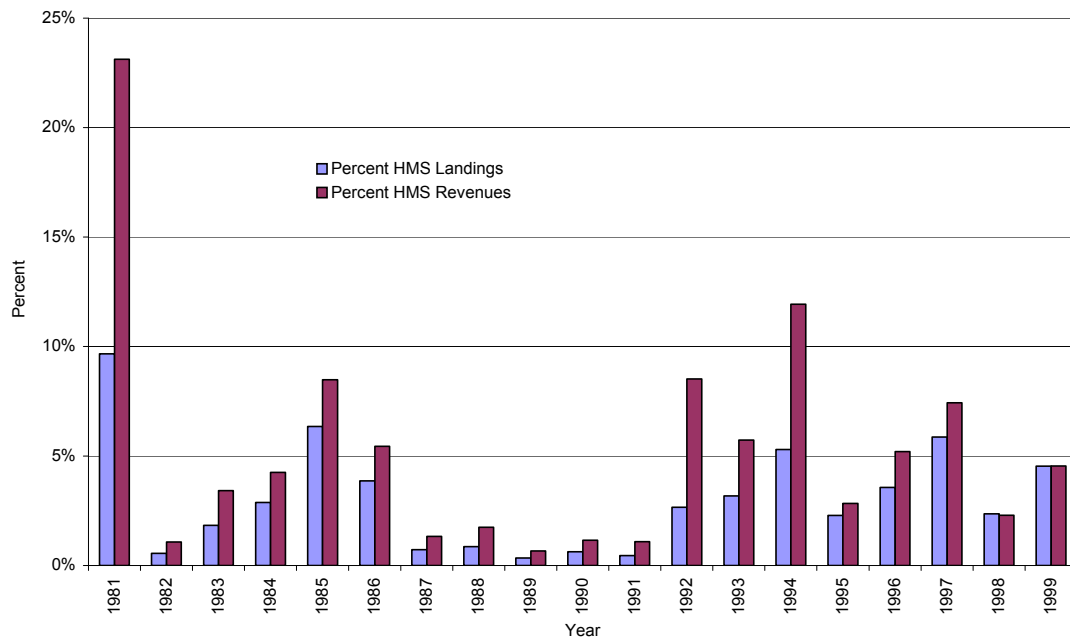
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Eureka, CA, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	546	1659						4437
1982	378	84						3519
1983	311	178						2677
1984	251	280						2657
1985	226	815						3875
1986	275	422			4			3278
1987	256	93						3820
1988	247	105						3247
1989	212	33						2449
1990	177	70						3791
1991	234	37				3		2809
1992	177	145			7	106		3603
1993	163	287			1	2		4347
1994	178	407				15		3944
1995	120	150				4		3500
1996	151	287						4261
1997	153	518			2	5		4930
1998	121	136						3364
1999	144	164						2906
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	546	\$5,689,208					\$300	\$9,398,658
1982	378	\$181,862						\$7,404,551
1983	311	\$333,964					\$239	\$4,019,298
1984	251	\$478,203					\$268	\$4,840,778
1985	226	\$1,197,708					\$284	\$5,639,505
1986	275	\$712,136			\$7,359			\$5,616,238
1987	256	\$214,978						\$7,151,370
1988	247	\$270,148						\$6,537,160
1989	212	\$66,602						\$3,550,148
1990	177	\$165,683						\$7,271,931
1991	234	\$79,275			\$562	\$23,001		\$4,114,655
1992	177	\$378,588	\$1,711	\$8	\$12,410	\$649,813	\$171	\$5,147,063
1993	163	\$634,139			\$1,509	\$16,887		\$6,215,062
1994	178	\$1,364,575	\$871		\$966	\$98,306		\$6,614,026
1995	120	\$289,538			\$1,430	\$21,973		\$6,369,408
1996	151	\$666,778						\$7,385,752
1997	153	\$946,449			\$3,050	\$25,220		\$7,824,339
1998	121	\$210,916						\$6,033,858
1999	144	\$333,394	\$469		\$72	\$3,506		\$6,103,300

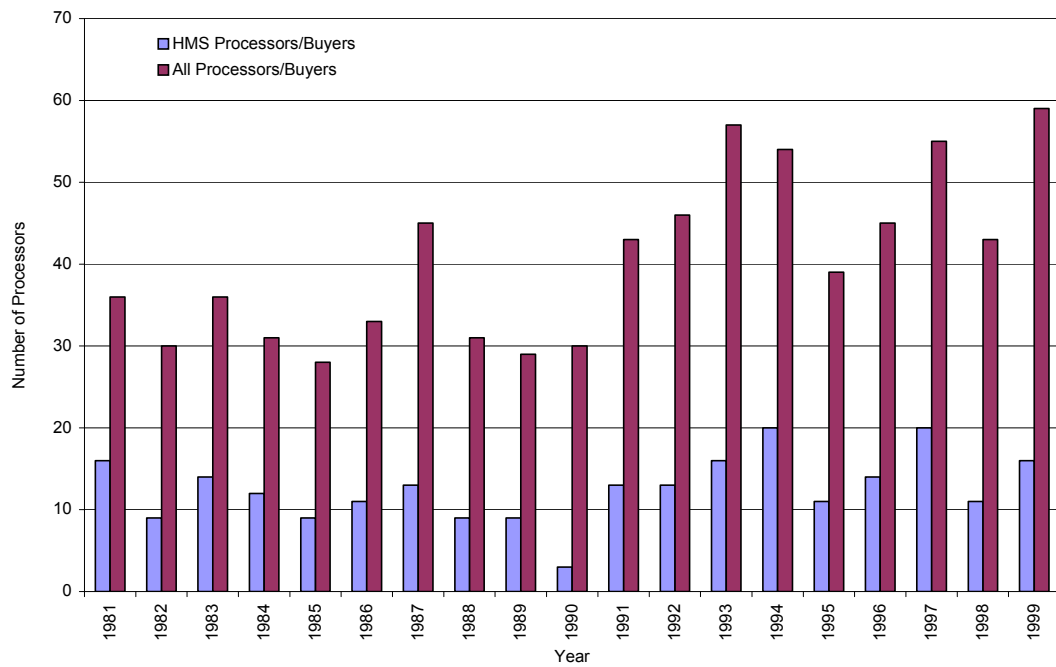
Proportion of vessels whose principal species is a HMS and whose principal port is Eureka, CA of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in Eureka, 1981-99.



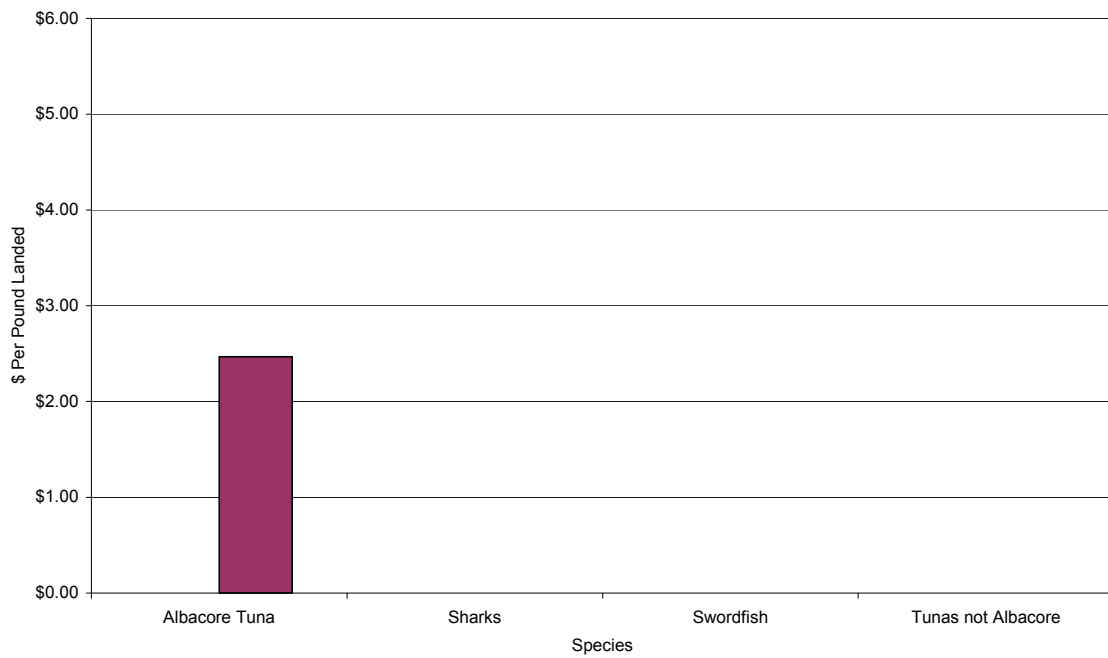
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Eureka, CA, 1981-99.



Number of processors/buyers in Eureka, CA, 1981-99.



Total income multipliers for landings of HMS of species in the port of Eureka, CA, based on 1996 landings and exvessel revenues.



A.4.3.8 HMS Community Profile: Fort Bragg, Mendocino County, CA

Mendocino County

Mendocino County's economic structure closely resembles that of the state. The main exception is the agriculture sector which in terms of income as a proportion of total income, is significantly greater than that of the state. In 1997, agriculture accounted for 12% of the County's total income. Of the northern California counties, Mendocino's government sector is the smallest. Manufacturing in Mendocino County accounted for almost 25% of non-agricultural labor and proprietor income in 1999. Other key industry sectors were retail trade, health services and tourism.

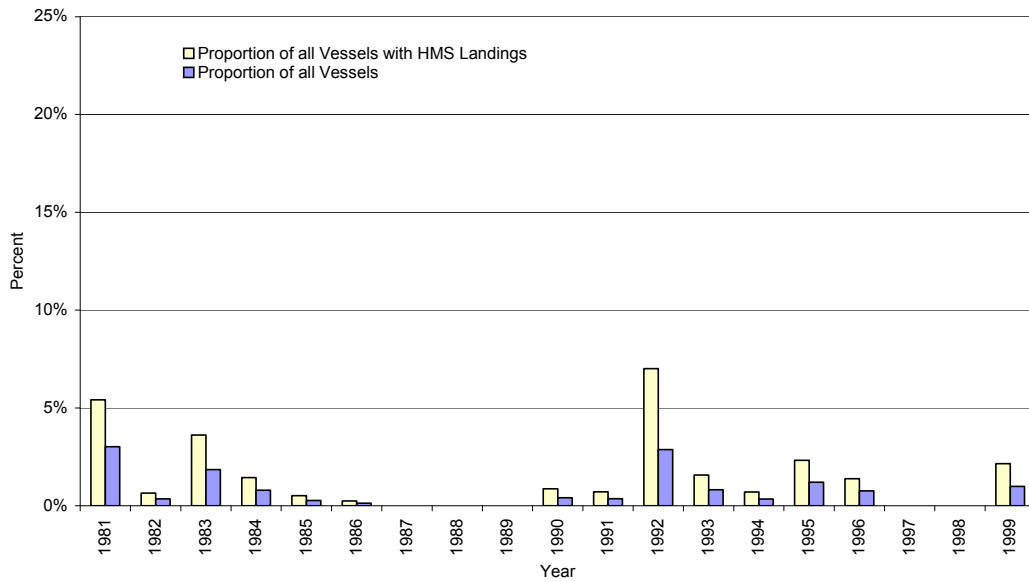
Number of vessels with HMS landings for which the Fort Bragg, CA area is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	26				0		67
1982	3				0		40
1983	11				0		59
1984	4				0		17
1985	2				0		29
1986	1				0		12
1987							17
1988							13
1989							14
1990	1				2		4
1991	0				2		2
1992	4				4		2
1993	1				2		3
1994	1				0		4
1995	1				2		4
1996	2				0		3
1997							19
1998							3
1999	2				0		13

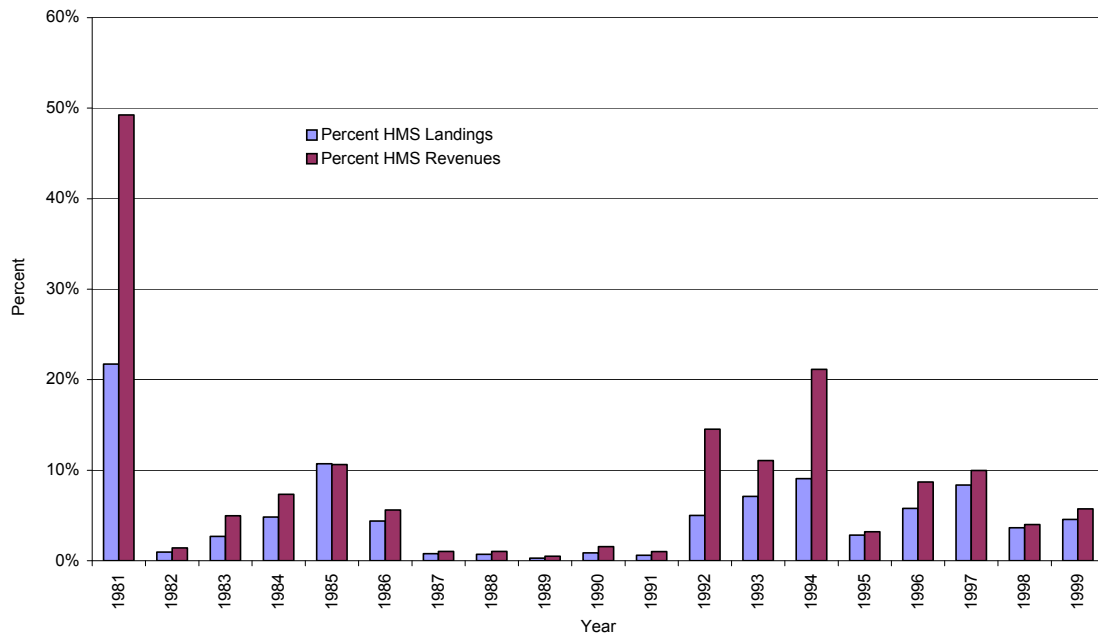
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Fort Bragg, CA, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	480	1659						4437
1982	460	84						3519
1983	304	178						2677
1984	278	280						2657
1985	389	815						3875
1986	399	422			4			3278
1987	510	93						3820
1988	485	105						3247
1989	469	33						2449
1990	347	70						3791
1991	279	37				3		2809
1992	114	145			7	106		3603
1993	191	287			1	2		4347
1994	143	407				15		3944
1995	129	150				4		3500
1996	144	287						4261
1997	119	518			2	5		4930
1998	93	136						3364
1999	93	164						2906
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	480	\$5,689,208					\$300	\$9,398,658
1982	460	\$181,862						\$7,404,551
1983	304	\$333,964					\$239	\$4,019,298
1984	278	\$478,203					\$268	\$4,840,778
1985	389	\$1,197,708					\$284	\$5,639,505
1986	399	\$712,136			\$7,359			\$5,616,238
1987	510	\$214,978						\$7,151,370
1988	485	\$270,148						\$6,537,160
1989	469	\$66,602						\$3,550,148
1990	347	\$165,683						\$7,271,931
1991	279	\$79,275			\$562	\$23,001		\$4,114,655
1992	114	\$378,588	\$1,711	\$8	\$12,410	\$649,813	\$171	\$5,147,063
1993	191	\$634,139			\$1,509	\$16,887		\$6,215,062
1994	143	\$1,364,575	\$871		\$966	\$98,306		\$6,614,026
1995	129	\$289,538			\$1,430	\$21,973		\$6,369,408
1996	144	\$666,778						\$7,385,752
1997	119	\$946,449			\$3,050	\$25,220		\$7,824,339
1998	93	\$210,916						\$6,033,858
1999	93	\$333,394	\$469		\$72	\$3,506		\$6,103,300

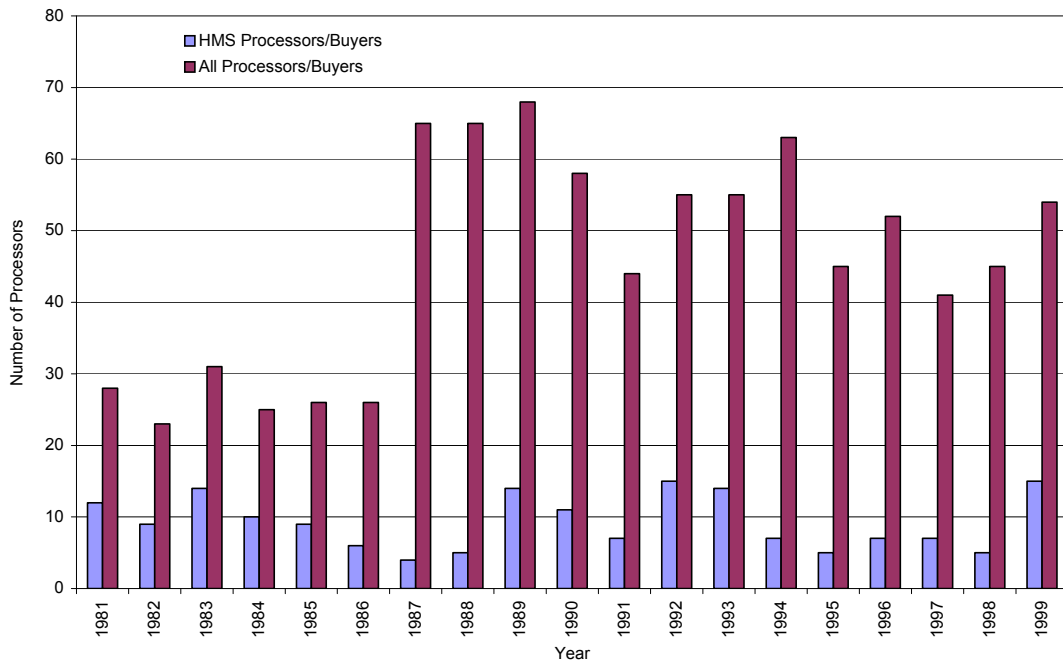
Proportion of vessels whose principal species is a HMS and whose principal port is Fort Bragg, CA of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in Fort Bragg, 1981-99.



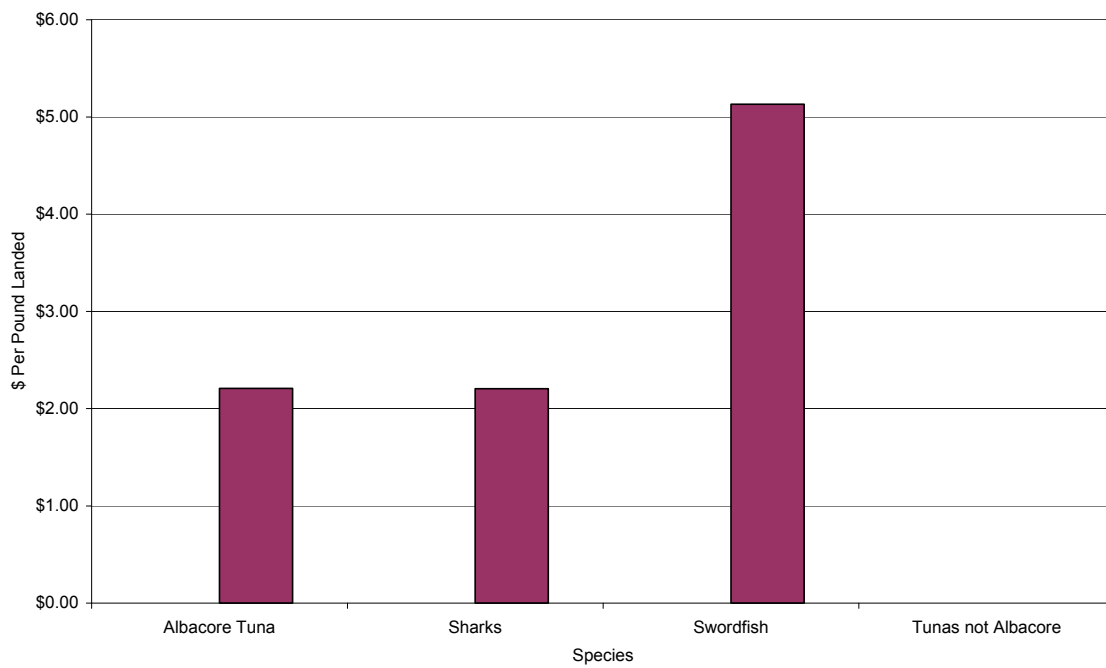
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Fort Bragg, CA, 1981-99.



Number of processors/buyers in Fort Bragg, CA, 1981-99.



Total income multipliers for landings of HMS of species in the port of Fort Bragg, CA, based on 1996 landings and exvessel revenues.



Northern California HMS Communities Demographic Profiles

	County					
	Del Norte		Humboldt		Mendocino	
	1990	2000	1990	2000	1990	2000
Population (numbers)	23,460	27,507	119,118	126,518	80,345	86,265
<i>Gender (Percent total population)</i>						
Male	54.3%	55.2%	49.7%	52.5%	49.8%	49.7%
Female	45.7%	44.8%	50.3%	53.7%	50.2%	50.3%
<i>Race and Hispanic origin (Percent total population)</i>						
White	86.1%	78.9%	90.6%	90.0%	89.6%	80.8%
Black	3.7%	4.3%	0.8%	0.9%	0.6%	0.6%
Native American	6.4%	6.4%	5.5%	6.1%	4.1%	4.8%
Asian or Pacific Islander	1.9%	2.4%	1.9%	2.0%	1.2%	1.3%
Other Race	1.9%	3.9%	1.2%	2.6%	4.5%	8.6%
Hispanic Origin (any race)	10.3%	13.9%	4.2%	6.9%	10.3%	16.5%
<i>Age Structure (Percent total population)</i>						
Under 5 years	7.4%	5.5%	7.2%	6.0%	7.3%	6.0%
5-9 Years	8.5%	6.8%	7.9%	6.6%	8.2%	6.9%
10-14 Years	7.4%	7.7%	7.0%	7.4%	7.7%	7.8%
15-19 Years	6.0%	7.5%	7.0%	8.4%	6.5%	7.6%
20-24 Years	6.9%	5.5%	7.8%	9.4%	5.2%	5.4%
25-34 Years	18.9%	14.4%	16.4%	13.4%	14.1%	11.2%
35-44 Years	14.3%	17.7%	17.0%	15.7%	17.9%	14.4%
45-54 Years	9.5%	13.7%	9.6%	16.7%	11.0%	16.9%
55-59 Years	4.0%	4.7%	3.8%	5.3%	4.1%	5.9%
60-64 Years	4.2%	3.9%	4.1%	4.0%	4.4%	4.4%
65-74 Years	8.0%	6.7%	7.2%	6.7%	8.0%	6.9%
75-84 Years	4.1%	4.4%	4.0%	4.8%	4.3%	4.9%
85 Years and greater	0.9%	1.4%	1.1%	1.7%	1.2%	1.7%
Median Age (years)	NA	36.4	NA	36.3	NA	38.9
18 Years and greater	73.0%	74.9%	74.3%	81.5%	72.7%	74.5%
Male	40.2%	42.4%	36.5%	39.8%	35.6%	36.7%
Female	32.9%	32.5%	37.8%	41.7%	37.1%	37.8%
21 Years and greater	69.5%	71.4%	69.3%	75.8%	69.2%	70.5%
62 Years and greater	15.5%	14.7%	14.7%	15.6%	16.4%	16.1%
65 Years and greater	12.9%	12.5%	12.3%	13.2%	13.6%	13.6%
Male	6.0%	5.7%	5.3%	5.6%	5.9%	5.9%
Female	6.9%	6.9%	7.0%	7.6%	7.7%	7.6%
<i>Educational Attainment (Persons 25 years and over)</i>						
Graduate or professional degree	2.1%	NA	3.8%	NA	3.8%	NA
Bachelor's degree	4.4%	NA	8.9%	NA	7.8%	NA
Associate's degree	4.7%	NA	4.9%	NA	4.3%	NA
Some college no degree	14.9%	NA	16.5%	NA	16.1%	NA
High school graduate	19.6%	NA	17.0%	NA	19.3%	NA
9th to 12th no diploma	12.7%	NA	8.5%	NA	8.6%	NA
Less than 9th grade	5.9%	NA	3.9%	NA	5.3%	NA
Economic Activity						
<i>Labor Force by Gender (Persons 16 years and over)</i>	37.7%	NA	47.3%	NA	47.2%	NA
Males	21.2%	NA	26.3%	NA	26.7%	NA
Females	16.5%	NA	21.0%	NA	33.0%	NA

Northern California HMS Communities Demographic Profiles

	County					
	Del Norte		Humboldt		Mendocino	
	1993	1999	1993	1999	1993	1999
Economic Activity (cont'd)						
<i>Employment (numbers)</i>						
Agricultural Services, Forestry, and Fishing (SIC-07)	57		620		255	
Fishing, hunting and trapping (SIC-0900)	27		14		0-19	
Mining (SIC-10)			0-19		0-19	
Construction (SIC-15)	148		1,846		1,034	
Manufacturing (SIC-20)	476		6,476		4,253	
Transportation and Public Utilities (SIC-40)	217		1,863		845	
Wholesale Trade (SIC-50)	237		1,363		1,256	
Retail Trade (SIC-52)	1697		9,469		5,839	
Finance, Insurance, and Real Estate (SIC-60)	157		1,677		1,021	
Services (SIC-70)	1238		10,859		6,148	
Unclassified Establishments (SIC-99)	12		20-99		0-19	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		107		937		660
Fishing (NAICS-11411)		20-99		20-99		20-99
Finfish fishing (NAICS-114111)				0-19		20-99
shellfish fishing (NAICS-114112)				14		12
Mining (NAICS-21)						20-99
Utilities (NAICS-22)		0-19		250-499		100-249
Construction (NAICS-23)		166		1,895		1,244
Manufacturing (NAICS-31)		250		5,262		4,231
Wholesale trade (NAICS-42)		140		1,295		1,079
Retail trade (NAICS-44)		920		6,868		4,569
Transportation & warehousing (NAICS-48)		65		888		506
Information (NAICS-51)		102		817		429
Finance & insurance (NAICS-52)		106		1,181		596
Real estate & rental & leasing (NAICS-53)		67		556		490
Professional, scientific & technical services (NAICS-54)		136		1,450		659
Management of companies & enterprises (NAICS-55)				244		108
Admin, support, waste mgt, remediation services (NAICS-56)		20-99		1,250		540
Educational services (NAICS-61)		0-19		371		312
Health care and social assistance (NAICS-62)		1,034		7,211		3,705
Arts, entertainment & recreation (NAICS-71)		272		647		870
Accommodation & food services (NAICS-72)		741		4,174		3,279
Other services (except public administration) (NAICS-81)		147		1,539		758
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)				20-99		205
Unclassified establishments (NAICS-99)		0-19		20-99		69
<i>Labor and Proprietor Income (\$1,000)</i>						
Agricultural Services, Forestry, and Fishing (SIC-07)	741		14,914		2,574	
Fishing, hunting and trapping (SIC-0900)	452		211		0	
Mining (SIC-10)			0		0	
Construction (SIC-15)	2791		37,276		21,948	
Manufacturing (SIC-20)	10399		181,618		113,195	
Transportation and Public Utilities (SIC-40)	5941		54,917		24,879	
Wholesale Trade (SIC-50)	3193		29,912		27,222	
Retail Trade (SIC-52)	18251		118,520		76,163	
Finance, Insurance, and Real Estate (SIC-60)	2796		34,346		21,015	
Services (SIC-70)	20523		174,320		96,049	
Unclassified Establishments (SIC-99)	79		0		0	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		3,645		34,762		28,008
Fishing (NAICS-11411)				0		0
Finfish fishing (NAICS-114111)				0		0
shellfish fishing (NAICS-114112)				26		107

Northern California HMS Communities Demographic Profiles

	County					
	Del Norte		Humboldt		Mendocino	
	1993	1999	1993	1999	1993	1999
Economic Activity (cont'd)						
<i>Labor and Proprietor Income (\$1,000) (cont'd)</i>						
Mining (NAICS-21)						0
Utilities (NAICS-22)		0		0		0
Construction (NAICS-23)		5,269		55,186		34,661
Manufacturing (NAICS-31)		6,201		159,329		138,919
Wholesale trade (NAICS-42)		3,210		36,462		29,040
Retail trade (NAICS-44)		13,981		122,349		86,497
Transportation & warehousing (NAICS-48)		1,387		26,000		14,759
Information (NAICS-51)		2,620		29,252		11,999
Finance & insurance (NAICS-52)		2,279		39,819		18,122
Real estate & rental & leasing (NAICS-53)		818		9,326		7,092
Professional, scientific & technical services (NAICS-54)		2,764		36,941		15,564
Management of companies & enterprises (NAICS-55)				13,575		3,586
Admin, support, waste mgt, remediation services (NAICS-56)		0		21,631		8,594
Educational services (NAICS-61)		0		4,499		6,829
Health care and social assistance (NAICS-62)		25,838		157,243		86,713
Arts, entertainment & recreation (NAICS-71)		4,574		7,719		12,992
Accommodation & food services (NAICS-72)		6,405		41,092		35,002
Other services (except public administration) (NAICS-81)		2,490		25,229		11,849
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)				0		7,360
Unclassified establishments (NAICS-99)		0		0		1,072
<i>Number of Establishments</i>						
Agricultural Services, Forestry, and Fishing (SIC-07)	17		71		60	
Fishing, hunting and trapping (SIC-0900)	8		10		2	
Mining (SIC-10)					3	
Construction (SIC-15)	59		416		338	
Manufacturing (SIC-20)	31		289		197	
Transportation and Public Utilities (SIC-40)	20		153		121	
Wholesale Trade (SIC-50)	17		163		140	
Retail Trade (SIC-52)	161		974		695	
Finance, Insurance, and Real Estate (SIC-60)	36		265		178	
Services (SIC-70)	175		1,274		875	
Unclassified Establishments (SIC-99)	5		30		20	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		25		116		114
Fishing (NAICS-11411)		13		12		37
Finfish fishing (NAICS-114111)				7		22
shellfish fishing (NAICS-114112)				5		15
Mining (NAICS-21)						5
Utilities (NAICS-22)		1		7		5
Construction (NAICS-23)		54		401		315
Manufacturing (NAICS-31)		16		194		166
Wholesale trade (NAICS-42)		11		117		98
Retail trade (NAICS-44)		79		660		489
Transportation & warehousing (NAICS-48)		11		86		66
Information (NAICS-51)		10		67		44
Finance & insurance (NAICS-52)		18		144		89
Real estate & rental & leasing (NAICS-53)		20		149		114
Professional, scientific & technical services (NAICS-54)		35		237		204
Management of companies & enterprises (NAICS-55)				13		6
Admin, support, waste mgt, remediation services (NAICS-56)		13		129		90
Educational services (NAICS-61)		5		34		23
Health care and social assistance (NAICS-62)		30		420		278
Arts, entertainment & recreation (NAICS-71)		13		55		52
Accommodation & food services (NAICS-72)		75		345		313
Other services (except public administration) (NAICS-81)		41		329		213
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)				4		3
Unclassified establishments (NAICS-99)		17		75		62

Northern California HMS Communities Demographic Profiles

Major HMS Ports	Crescent City		Eureka		Ft. Bragg	
	1990	2000	1990	2000	1990	2000
Population (numbers)	4380	4,006	27,025	26,128	6,078	7,026
<i>Gender (Percent total population)</i>						
Male	47.5%	46.2%	48.6%	49.5%	48.1%	50.1%
Female	52.5%	53.8%	51.4%	50.5%	51.9%	49.9%
<i>Race and Hispanic origin (Percent total population)</i>						
White	89.4%	78.3%	88.2%	82.5%	89.0%	79.5%
Black	0.6%	0.5%	1.4%	1.6%	0.5%	1.0%
Native American	5.2%	6.1%	4.6%	4.2%	1.6%	1.9%
Asian or Pacific Islander	3.1%	4.7%	4.4%	3.9%	0.8%	1.0%
Other Race	1.7%	4.3%	1.4%	2.7%	8.1%	12.1%
Hispanic Origin (any race)	7.6%	11.0%	4.8%	7.8%	13.7%	22.7%
<i>Age Structure (Percent total population)</i>						
Under 5 years	8.8%	9.1%	7.4%	5.7%	7.9%	6.8%
5-9 Years	10.0%	8.1%	7.5%	6.2%	7.1%	6.7%
10-14 Years	8.0%	8.0%	6.6%	6.4%	6.6%	7.0%
15-19 Years	6.9%	8.5%	6.1%	7.3%	6.3%	7.0%
20-24 Years	7.0%	7.6%	7.5%	8.4%	6.9%	6.5%
25-34 Years	15.8%	11.9%	16.6%	13.8%	16.8%	14.2%
35-44 Years	14.1%	14.8%	16.1%	15.0%	14.6%	15.8%
45-54 Years	8.7%	11.1%	9.2%	15.2%	9.3%	14.1%
55-59 Years	3.3%	3.4%	4.1%	4.7%	3.4%	4.4%
60-64 Years	3.5%	3.6%	4.0%	3.6%	4.9%	3.6%
65-74 Years	8.0%	6.7%	8.2%	6.5%	8.3%	6.0%
75-84 Years	4.4%	5.3%	5.2%	5.1%	5.9%	5.7%
85 Years and greater	1.5%	1.8%	1.5%	2.1%	1.9%	2.2%
Median Age (Years)	NA	32.1	NA	0.1%	NA	0.5%
18 Years and greater	68.8%	69.9%	75.1%	77.6%	74.9%	75.4%
Male	31.4%	31.6%	35.8%	38.0%	35.1%	37.5%
Female	37.4%	38.3%	39.3%	39.7%	39.8%	37.8%
21 Years and greater	64.5%	64.6%	70.8%	72.6%	70.6%	71.2%
62 Years and greater	16.2%	15.9%	17.2%	15.6%	19.4%	16.0%
65 Years and greater	13.9%	13.9%	14.9%	13.7%	16.1%	13.9%
Male	5.2%	5.2%	5.8%	5.4%	6.0%	4.9%
Female	8.7%	8.6%	9.1%	8.3%	10.1%	9.0%
Educational Attainment (Persons 25 years and over)						
Graduate or professional degree	2.5%	NA	3.1%	NA	2.8%	NA
Bachelor's degree	4.6%	NA	8.6%	NA	5.6%	NA
Associate's degree	3.1%	NA	5.2%	NA	3.9%	NA
Some college no degree	12.3%	NA	17.7%	NA	13.1%	NA
High school graduate	20.9%	NA	17.0%	NA	22.0%	NA
9th to 12th no diploma	11.9%	NA	9.1%	NA	10.1%	NA
Less than 9th grade	5.0%	NA	4.4%	NA	7.2%	NA
Economic Activity (Percent total population)						
<i>Labor Force by Gender (Persons 16 years and over)</i>	40.7%	NA	46.2%	NA	48.4%	NA
Males	20.7%	NA	25.1%	NA	27.1%	NA
Females	20.0%	NA	21.1%	NA	21.3%	NA

Source: U.S. Bureau of Census

A.4.3.9 HMS Community Profile: Bodega Bay, Sonoma County, CA

Sonoma County

<http://www.sonoma-county.org/index.htm>

In 1999, the manufacturing sector accounted for almost 22% of the county's non-agricultural labor and proprietor income. Health services, retail trade, construction and finance and insurance were other key contributors to Sonoma County's economy in 1999. Agriculture is a vital component of the County's economy, accounting for six percent of total income in 1997.

Sonoma County environments range from the surf-pounded cliffs of the coast to the golden Mayacamas Mountains, from the cool stillness of redwood forests to the muddy marshes that feed San Francisco Bay. The economy is strong and equally diverse - from the vineyards of the Alexander Valley to high-tech Telecom Valley.

Sonoma County encompasses over one million acres of land and water, rich in scenic beauty with an array of parks, recreational facilities, campsites and lakes. Open space and agricultural land accounts for a great majority of Sonoma County acreage. The county has approximately 20,230 acres of surface water area, of which 8,580 are bay waters.

Unemployment rates for Sonoma County in the previous four years have maintained a level at least 2% lower than the California average unemployment rate. Between May 1998 and May 1999, Sonoma County employment levels grew by 5,100 jobs, representing a 2.8% growth. The services industry continued to lead growth with 1,900 new jobs. Large gains were also reported in business services and government.

The region's longest period of economic expansion in at least twenty-five years continued in 2000, spurred by a healthy \$15 billion economy that out-performed both California and the nation. Small businesses (establishments with less than 50 workers) account for more than half of Sonoma County's private sector employment.

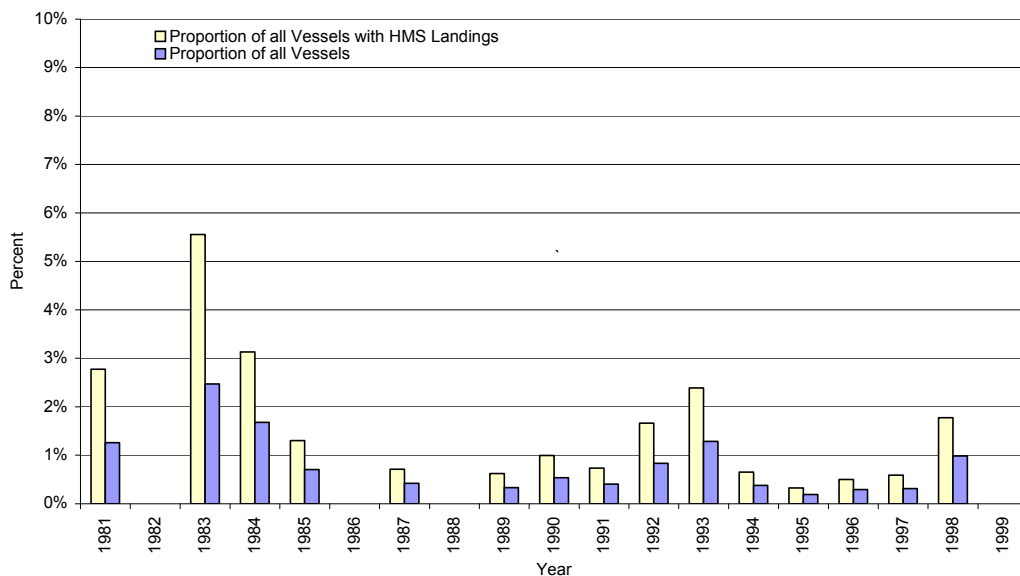
Number of vessels with HMS landings, for which Bodega Bay, CA is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	12			0	0		61
1982							20
1983	15			0	0		30
1984	10			1	1		41
1985	4			0	2		34
1986							20
1987	1			0	3		41
1988							21
1989	0			0	3		17
1990	0			0	4		15
1991	0			0	3		5
1992	1			1	3		6
1993	2			0	5		10
1994	1			0	1		15
1995	0			0	1		3
1996	0			0	1		5
1997	0			0	1		32
1998	3			0	0		15
1999							9

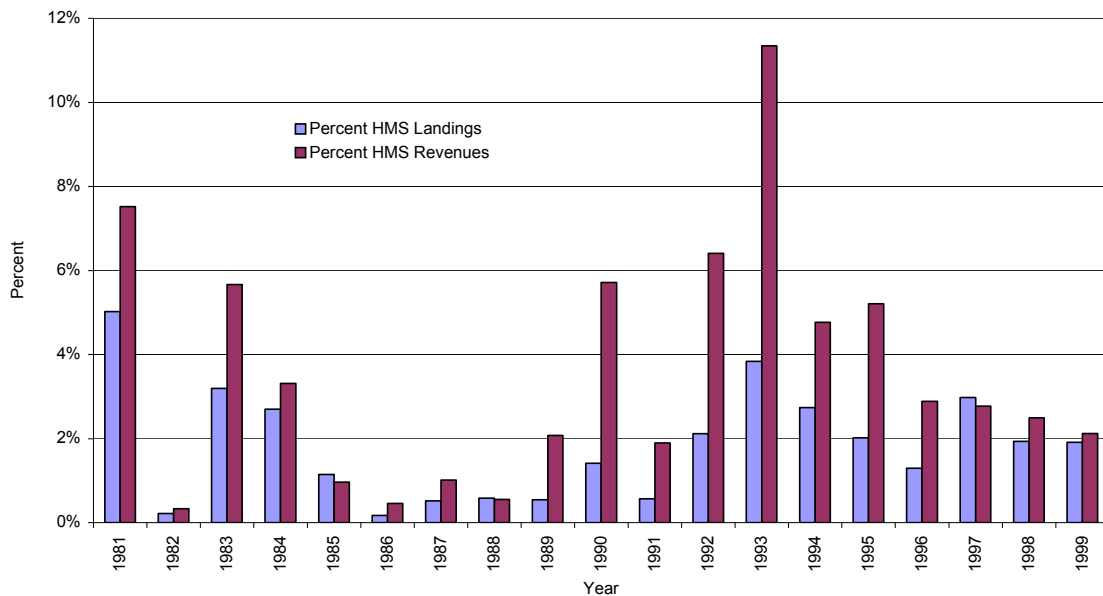
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Bodega Bay, CA, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	432	193						1153
1982	494	13						2142
1983	270	133			2			1863
1984	383	94			23	3		2984
1985	460	32			2	4		2783
1986	398	2			3	4		3174
1987	560	17			3	11		3533
1988	581	40				1		4191
1989	483	7				21		2533
1990	400	3			6	74		2237
1991	408	2			5	28		3206
1992	301	26	1		12	74		2945
1993	293	34	2		7	99		2039
1994	308	38	2		11	22		1439
1995	306	10	3		2	47		1786
1996	200	14				14		1283
1997	170	78				4		1732
1998	169	35				4		1368
1999	175	27				2		1059
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	432	\$625,497			\$72			\$4,584,336
1982	494	\$31,217			\$772			\$5,885,578
1983	270	\$255,779			\$2,653		\$355	\$2,338,530
1984	383	\$163,380	\$452	\$18	\$51,845	\$16,192		\$4,989,103
1985	460	\$50,081	\$32		\$5,149	\$18,834	\$33	\$6,091,806
1986	398	\$3,310			\$7,917	\$28,978		\$6,011,388
1987	560	\$35,635			\$7,887	\$104,021		\$10,532,634
1988	581	\$99,670			\$231	\$13,883		\$13,576,072
1989	483	\$19,488			\$1,862	\$155,220	\$63	\$4,506,484
1990	400	\$7,767	\$240		\$10,691	\$524,408	\$211	\$4,541,290
1991	408	\$5,230			\$9,005	\$196,995	\$1,264	\$5,728,061
1992	301	\$76,900	\$5,236		\$18,224	\$438,338	\$1,926	\$4,113,922
1993	293	\$77,974	\$8,398		\$10,156	\$555,921	\$1,201	\$2,762,746
1994	308	\$80,448	\$11,711		\$21,393	\$144,136		\$3,000,986
1995	306	\$18,514	\$12,792		\$4,349	\$295,282	\$356	\$3,885,889
1996	200	\$39,569	\$1,400		\$1,062	\$70,096	\$177	\$2,290,852
1997	170	\$129,671	\$1,604		\$950	\$20,511		\$3,678,031
1998	169	\$106,200	\$159		\$210	\$26,860		\$3,936,634
1999	175	\$68,469	\$477		\$82	\$7,851		\$2,454,025

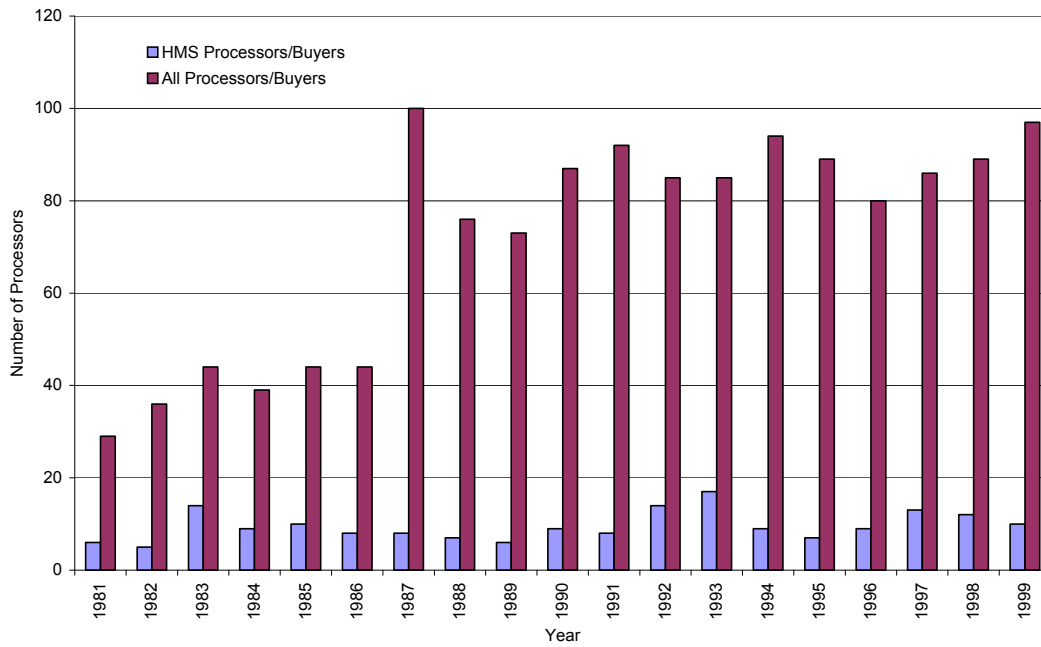
Proportion of vessels whose principal species is a HMS and whose principal port is Bodega Bay CA, of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in Bodega Bay, 1981-99.



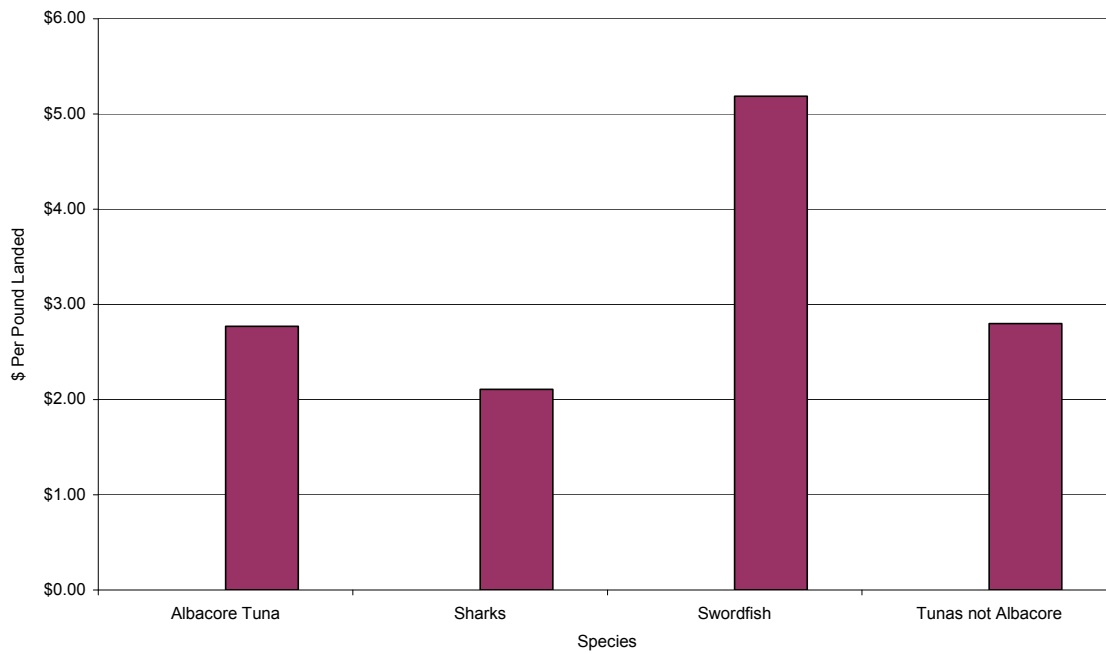
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Bodega Bay, CA, 1981-99.



Number of processors/buyers in Bodega Bay, CA, 1981-99.



Total income multipliers for landings of HMS of species in the port of Bodega Bay, CA, based on 1996 landings and exvessel revenues.



Sonoma County California HMS Communities Demographic Profiles

	County	
	Sonoma	
	1990	2000
Population (numbers)	388,222	458,614
<i>Gender (Percent total population)</i>		
Male	49.0%	49.2%
Female	51.0%	50.8%
<i>Race and Hispanic origin (Percent total population)</i>		
White	90.6%	81.6%
Black	1.4%	1.4%
Native American	1.1%	1.2%
Asian or Pacific Islander	2.8%	3.3%
Other Race	4.1%	8.4%
Hispanic Origin (any race)	10.6%	17.3%
<i>Age Structure (Percent total population)</i>		
Under 5 years	7.3%	6.0%
5-9 Years	7.4%	6.9%
10-14 Years	6.5%	7.2%
15-19 Years	6.1%	7.1%
20-24 Years	6.3%	6.1%
25-34 Years	16.8%	12.7%
35-44 Years	18.4%	16.5%
45-54 Years	10.4%	16.1%
55-59 Years	3.7%	5.2%
60-64 Years	3.8%	3.6%
65-74 Years	7.5%	6.0%
75-84 Years	4.6%	4.9%
85 Years and greater	1.3%	1.8%
Median Age (years)	NA	37.5
18 Years and greater	75.3%	75.5%
Male	36.3%	36.6%
Female	39.1%	38.9%
21 Years and greater	71.3%	71.4%
62 Years and greater	15.7%	14.7%
65 Years and greater	13.4%	12.6%
Male	5.5%	5.2%
Female	7.9%	7.4%
<i>Educational Attainment (Persons 25 years and over)</i>		
Graduate or professional degree	5.2%	NA
Bachelor's degree	11.1%	NA
Associate's degree	6.3%	NA
Some college no degree	17.6%	NA
High school graduate	16.0%	NA
9th to 12th no diploma	6.6%	NA
Less than 9th grade	3.8%	NA
Economic Activity		
<i>Labor Force by Gender (Persons 16 years and over)</i>	52.6%	NA
Males	28.7%	NA
Females	23.9%	NA

Sonoma County California HMS Communities Demographic Profiles

	County	
	Sonoma	
	1993	1,999
Economic Activity (Cont'd)		
<i>Employment (numbers)</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	1,833	
Fishing, hunting and trapping (SIC-0900)	20-99	
Mining (SIC-10)	174	
Construction (SIC-15)	8,413	
Manufacturing (SIC-20)	20,808	
Transportation and Public Utilities (SIC-40)	5,761	
Wholesale Trade (SIC-50)	7,668	
Retail Trade (SIC-52)	31,233	
Finance, Insurance, and Real Estate (SIC-60)	12,341	
Services (SIC-70)	40,367	
Unclassified Establishments (SIC-99)	121	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		385
Fishing (NAICS-11411)		0-19
Finfish fishing (NAICS-114111)		0-19
shellfish fishing (NAICS-114112)		
Mining (NAICS-21)		229
Utilities (NAICS-22)		500-999
Construction (NAICS-23)		11,878
Manufacturing (NAICS-31)		26,391
Wholesale trade (NAICS-42)		7,048
Retail trade (NAICS-44)		24,643
Transportation & warehousing (NAICS-48)		2,692
Information (NAICS-51)		3,998
Finance & insurance (NAICS-52)		10,612
Real estate & rental & leasing (NAICS-53)		2,757
Professional, scientific & technical services (NAICS-54)		7,117
Management of companies & enterprises (NAICS-55)		862
Admin, support, waste mgt, remediation services (NAICS-56)		10,355
Educational services (NAICS-61)		1,933
Health care and social assistance (NAICS-62)		22,328
Arts, entertainment & recreation (NAICS-71)		2,970
Accommodation & food services (NAICS-72)		14,354
Other services (except public administration) (NAICS-81)		7,218
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		607
Unclassified establishments (NAICS-99)		250-999
<i>Labor and Proprietor Income (\$1,000)</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	26,289	
Fishing, hunting and trapping (SIC-0900)	-	
Mining (SIC-10)	6,456	
Construction (SIC-15)	226,031	
Manufacturing (SIC-20)	629,655	
Transportation and Public Utilities (SIC-40)	179,793	
Wholesale Trade (SIC-50)	218,086	
Retail Trade (SIC-52)	472,072	
Finance, Insurance, and Real Estate (SIC-60)	411,293	
Services (SIC-70)	872,424	
Unclassified Establishments (SIC-99)	1,733	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		9,068
Fishing (NAICS-11411)		0
Finfish fishing (NAICS-114111)		0
shellfish fishing (NAICS-114112)		
Mining (NAICS-21)		14,545
Utilities (NAICS-22)		0

Sonoma County California HMS Communities Demographic Profiles

	County	
	Sonoma	
	1993	1,999
Economic Activity (Cont'd)		
<i>Labor and Proprietor Income (\$1,000) (cont'd)</i>		
Construction (NAICS-23)		438,855
Manufacturing (NAICS-31)		1,069,054
Wholesale trade (NAICS-42)		280,641
Retail trade (NAICS-44)		570,304
Transportation & warehousing (NAICS-48)		68,282
Information (NAICS-51)		176,619
Finance & insurance (NAICS-52)		470,185
Real estate & rental & leasing (NAICS-53)		73,155
Professional, scientific & technical services (NAICS-54)		324,861
Management of companies & enterprises (NAICS-55)		33,734
Admin, support, waste mgt, remediation services (NAICS-56)		249,959
Educational services (NAICS-61)		34,589
Health care and social assistance (NAICS-62)		655,209
Arts, entertainment & recreation (NAICS-71)		45,856
Accommodation & food services (NAICS-72)		176,347
Other services (except public administration) (NAICS-81)		147,976
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		50,013
Unclassified establishments (NAICS-99)		0
<i>Number of Establishments</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	332	
Fishing, hunting and trapping (SIC-0900)	3	
Mining (SIC-10)	22	
Construction (SIC-15)	1,707	
Manufacturing (SIC-20)	780	
Transportation and Public Utilities (SIC-40)	430	
Wholesale Trade (SIC-50)	703	
Retail Trade (SIC-52)	2,597	
Finance, Insurance, and Real Estate (SIC-60)	1,112	
Services (SIC-70)	4,383	
Unclassified Establishments (SIC-99)	129	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		54
Fishing (NAICS-11411)		2
Finfish fishing (NAICS-114111)		2
shellfish fishing (NAICS-114112)		17
Mining (NAICS-21)		15
Utilities (NAICS-22)		1,831
Construction (NAICS-23)		801
Manufacturing (NAICS-31)		630
Wholesale trade (NAICS-42)		1,774
Retail trade (NAICS-44)		263
Transportation & warehousing (NAICS-48)		217
Information (NAICS-51)		672
Finance & insurance (NAICS-52)		580
Real estate & rental & leasing (NAICS-53)		1,319
Professional, scientific & technical services (NAICS-54)		53
Management of companies & enterprises (NAICS-55)		660
Admin, support, waste mgt, remediation services (NAICS-56)		150
Educational services (NAICS-61)		1,474
Health care and social assistance (NAICS-62)		184
Arts, entertainment & recreation (NAICS-71)		1,027
Accommodation & food services (NAICS-72)		1,098
Other services (except public administration) (NAICS-81)		18
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		310
Unclassified establishments (NAICS-99)		

Major HMS Ports	Bodega Bay, Sonoma Co.	
	1990	2,000
Population (numbers)	1,127	1,423
<i>Gender (Percent total population)</i>		
Male	51.9%	51.9%
Female	48.1%	48.1%
<i>Race and Hispanic origin (Percent total population)</i>		
White	94.0%	85.5%
Black		0.4%
Native American	0.1%	1.5%
Asian or Pacific Islander	1.9%	1.3%
Other Race	4.1%	9.1%
Hispanic Origin (any race)	6.6%	15.2%
<i>Age Structure (Percent total population)</i>		
Under 5 years	4.5%	3.6%
5-9 Years	3.5%	4.4%
10-14 Years	3.2%	3.2%
15-19 Years	4.7%	3.0%
20-24 Years	3.9%	4.7%
25-34 Years	10.2%	10.4%
35-44 Years	19.9%	11.3%
45-54 Years	15.4%	16.9%
55-59 Years	7.8%	9.8%
60-64 Years	9.1%	9.9%
65-74 Years	12.8%	14.5%
75-84 Years	4.7%	6.9%
85 Years and greater	0.4%	1.4%
Median Age (Years)	NA	50.9
18 Years and greater	86.9%	87.3%
Male	44.6%	45.0%
Female	42.2%	42.3%
21 Years and greater	83.0%	84.9%
62 Years and greater	23.2%	28.6%
65 Years and greater	17.8%	22.8%
Male	9.5%	12.5%
Female	8.3%	10.3%
Educational Attainment (Persons 25 years and over)		
Graduate or professional degree	16.6%	NA
Bachelor's degree	13.8%	NA
Associate's degree	11.3%	NA
Some college no degree	15.7%	NA
High school graduate	12.7%	NA
9th to 12th no diploma	2.0%	NA
Less than 9th grade	1.9%	NA
Economic Activity (Percent total population)		
<i>Labor Force by Gender (Persons 16 years and over)</i>	45.2%	NA
Males	24.8%	NA
Females	20.3%	NA

Source: U.S. Bureau of Census

A.4.3.10 HMS Community Profile: San Francisco Bay Area, CA

San Francisco and Alameda Counties

In 1999, finance and insurance, professional, scientific and technical services, and information were the most important sectors of the San Francisco County economy in terms of non-agricultural labor and proprietor income. The most important Alameda County sectors in this regard were construction, manufacturing, real estate, rental and leasing, and educational services. Natural resource based industries, including fisheries, contributed minimally, relative to the above sectors, to the San Francisco and Alameda County economies during 1999.

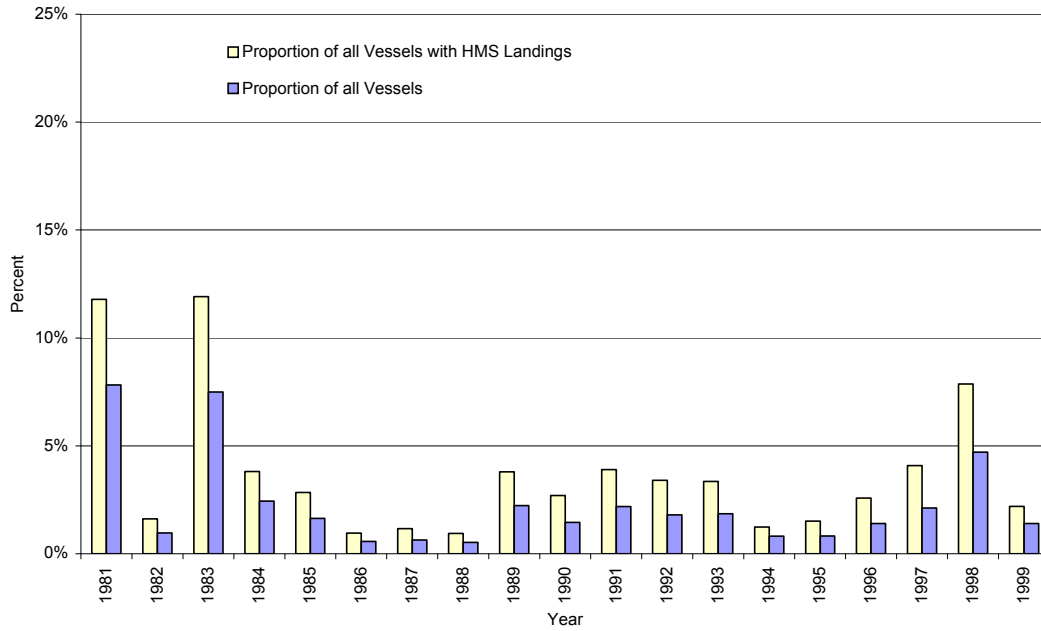
Number of vessels with HMS landings, for which San Francisco Bay Area, CA is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	75				0	1	49
1982	9				0	0	30
1983	60				1	0	105
1984	18				1	0	40
1985	11				2	0	39
1986	3				1	0	27
1987	5				0	0	27
1988	2				2	0	15
1989	8				10	0	22
1990	4				5	0	17
1991	8				5	0	13
1992	7				3	0	11
1993	4				4	0	5
1994	3				0	0	11
1995	0				3	0	12
1996	2				4	0	10
1997	6				3	0	32
1998	8				9	0	29
1999	4				1	0	24

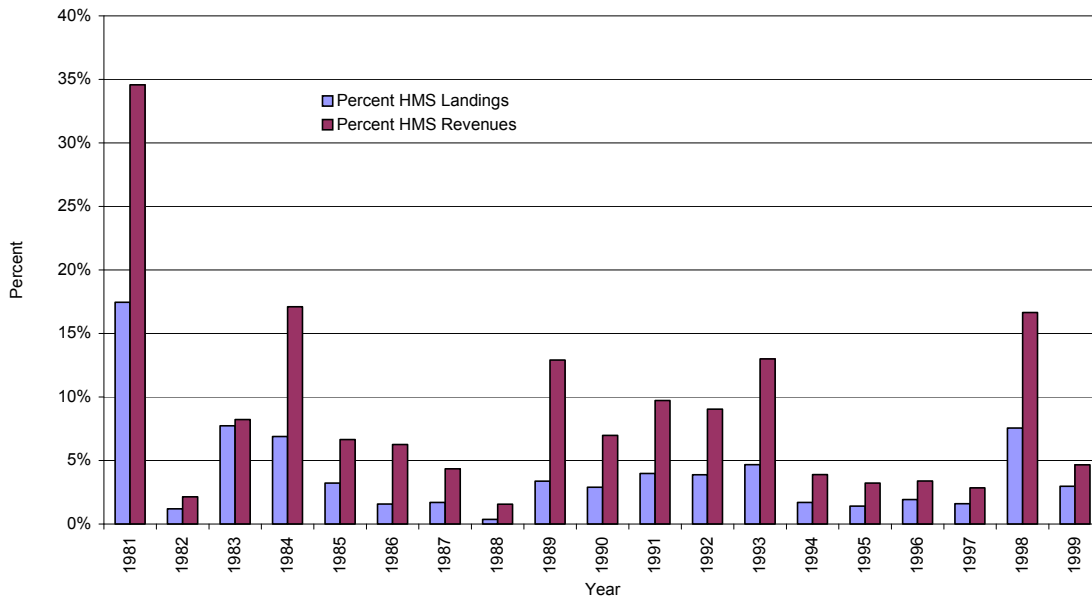
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, San Francisco Bay Area, CA, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	645	1993					1	5488
1982	557	179			1			9212
1983	512	834			14	32	2	6025
1984	499	403			35	239		6397
1985	457	285			24	107		7080
1986	418	51			5	118		5657
1987	429	142			2	38		5935
1988	426	15			2	24		6170
1989	474	222			9	193		6526
1990	333	189			8	138		5374
1991	333	229			31	163		4908
1992	294	182	13		6	140		4196
1993	239	167	2		9	84		2656
1994	243	28			5	27		1980
1995	199	14	1		8	48		2585
1996	233	46	6		5	81	1	3731
1997	220	75	13		24	74		4535
1998	216	44	7		8	184	23	1705
1999	228	63	1			38	4	1748
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	645	\$6,677,543		\$71	\$262	\$2,287	\$2,297	\$7,830,992
1982	557	\$435,144		\$514	\$2,276	\$264	\$314	\$12,094,625
1983	512	\$1,609,334	\$14		\$22,303	\$161,471	\$2,519	\$10,452,802
1984	499	\$699,240	\$377		\$63,160	\$1,248,757	\$739	\$7,185,990
1985	457	\$435,114	\$31		\$55,316	\$557,777	\$924	\$8,908,566
1986	418	\$93,561			\$9,846	\$806,168	\$1,483	\$7,589,571
1987	429	\$319,486			\$6,129	\$327,504	\$406	\$8,904,186
1988	426	\$46,843			\$4,432	\$195,590	\$190	\$9,995,720
1989	474	\$484,355	\$68		\$21,430	\$1,305,731	\$203	\$7,061,808
1990	333	\$421,338	\$993		\$14,997	\$791,790		\$8,478,952
1991	333	\$427,733	\$170		\$42,126	\$1,196,473	\$2,196	\$7,375,683
1992	294	\$495,512	\$10,863		\$10,772	\$781,953	\$758	\$5,859,679
1993	239	\$367,067	\$9,084		\$13,802	\$397,576	\$591	\$2,962,618
1994	243	\$56,422	\$1,536	\$197	\$17,617	\$160,806	\$1,854	\$3,539,841
1995	199	\$23,752	\$7,888		\$14,503	\$314,416	\$183	\$5,281,735
1996	233	\$90,067	\$20,092		\$9,958	\$449,636	\$8,036	\$7,099,089
1997	220	\$125,823	\$63,744		\$36,466	\$355,396	\$146	\$7,919,742
1998	216	\$76,091	\$40,548	\$383	\$12,290	\$735,660	\$117,748	\$3,473,186
1999	228	\$112,512	\$7,068		\$1,501	\$149,248	\$23,211	\$3,798,119

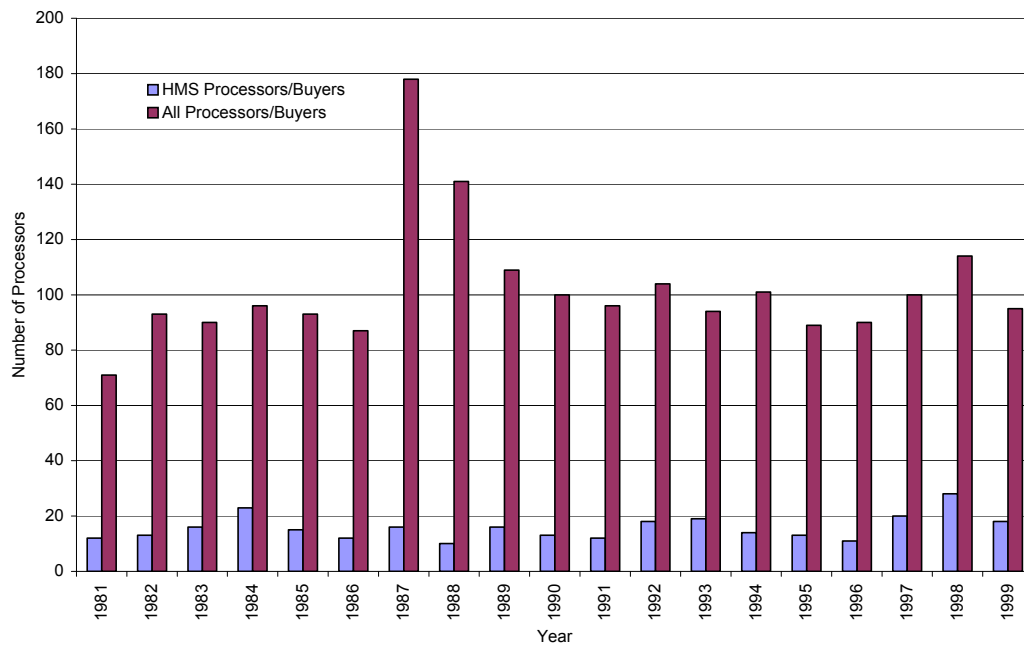
Proportion of vessels whose principal species is a HMS & whose principal port is San Francisco Area, CA of all vessels making HMS landings, & the proportion of these vessels of the total no. of vessels making landings in the San Francisco Area, 1981-99.



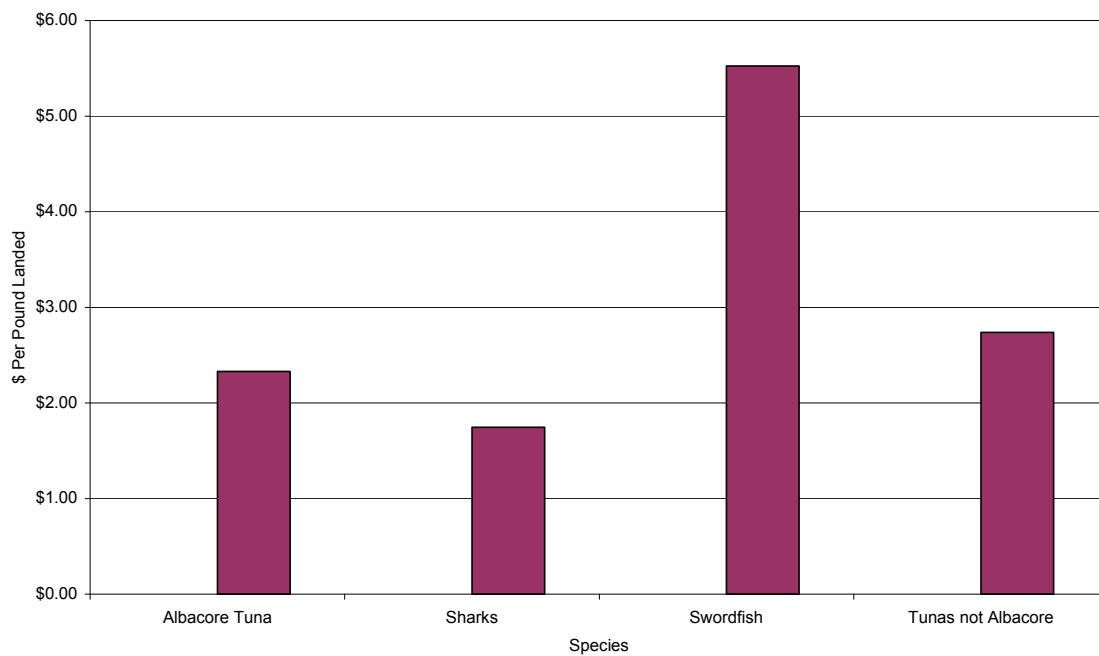
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in San Francisco Bay Area, CA, 1981-99.



Number of processors/buyers in the San Francisco Bay Area, 1981-99.



Total income multipliers for landings of HMS of species in the San Francisco Bay Area.



San Francisco Bay Area California HMS Communities Demographic Profiles

	County			
	San Francisco		Alameda	
	1990	2000	1990	2000
Population (numbers)	723,959	776,733	1,279,182	1,443,741
<i>Gender (Percent total population)</i>				
Male	50.1%	50.8%	49.3%	49.1%
Female	49.9%	49.2%	50.7%	50.9%
<i>Race and Hispanic origin (Percent total population)</i>				
White	53.6%	49.7%	59.6%	48.8%
Black	10.9%	7.8%	17.9%	14.9%
Native American	0.5%	0.4%	0.7%	0.6%
Asian or Pacific Islander	29.1%	30.2%	15.1%	21.1%
Other Race	5.9%	6.5%	6.8%	8.9%
Hispanic Origin (any race)	13.9%	14.1%	14.2%	19.0%
<i>Age Structure (Percent total population)</i>	0.0%			
Under 5 years	4.9%	4.1%	7.5%	6.8%
5-9 Years	4.4%	4.1%	6.8%	7.2%
10-14 Years	4.2%	4.0%	6.0%	6.7%
15-19 Years	4.9%	4.3%	6.3%	6.4%
20-24 Years	8.2%	7.2%	8.4%	7.0%
25-34 Years	21.9%	23.2%	19.6%	16.7%
35-44 Years	17.9%	17.2%	17.2%	17.2%
45-54 Years	10.3%	13.9%	10.3%	13.9%
55-59 Years	4.3%	4.5%	3.8%	4.5%
60-64 Years	4.5%	3.9%	3.6%	3.3%
65-74 Years	7.9%	6.9%	6.2%	5.2%
75-84 Years	5.0%	4.9%	3.3%	3.7%
85 Years and greater	1.7%	1.8%	1.1%	1.3%
Median Age (years)	NA	36.5	NA	34.5
18 Years and greater	83.9%	85.5%	76.3%	75.4%
Male	41.8%	43.4%	37.2%	36.6%
Female	42.1%	42.1%	39.1%	38.9%
21 Years and greater	80.3%	82.5%	71.7%	71.4%
62 Years and greater	17.2%	15.9%	12.8%	12.1%
65 Years and greater	14.6%	13.7%	10.6%	10.2%
Male	5.8%	5.7%	4.2%	4.2%
Female	8.7%	7.9%	6.4%	6.1%
<i>Educational Attainment (Persons 25 years and over)</i>				
Graduate or professional degree	9.6%	NA	7.1%	NA
Bachelor's degree	16.3%	NA	11.7%	NA
Associate's degree	4.6%	NA	5.1%	NA
Some college no degree	13.7%	NA	14.5%	NA
High school graduate	13.5%	NA	14.9%	NA
9th to 12th no diploma	7.9%	NA	7.3%	NA
Less than 9th grade	8.4%	NA	4.8%	NA
Economic Activity				
<i>Labor Force by Gender (Persons 16 years and over)</i>	57.6%	NA	53.9%	NA
Males	31.5%	NA	29.2%	NA
Females	26.1%	NA	24.7%	NA

San Francisco Bay Area California HMS Communities Demographic Profiles

	County			
	San Francisco		Alameda	
	1993	1999	1993	1999
Economic Activity (cont'd)				
<i>Employment (numbers)</i>				
Agricultural Services, Forestry, and Fishing (SIC-07)	916		3,186	
Fishing, hunting and trapping (SIC-0900)			0-19	
Mining (SIC-10)	1,344		373	
Construction (SIC-15)	13,743		25,165	
Manufacturing (SIC-20)	36,921		81,338	
Transportation and Public Utilities (SIC-40)	46,846		39,157	
Wholesale Trade (SIC-50)	23,930		50,496	
Retail Trade (SIC-52)	75,330		95,843	
Finance, Insurance, and Real Estate (SIC-60)	73,720		30,666	
Services (SIC-70)	214,889		175,302	
Unclassified Establishments (SIC-99)	195		331	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		0-19		100-249
Fishing (NAICS-11411)		0-19		0-19
Finfish fishing (NAICS-114111)				0-19
shellfish fishing (NAICS-114112)				
Mining (NAICS-21)		20-99		250-499
Utilities (NAICS-22)		5000-9999		1,654
Construction (NAICS-23)		21,119		39,026
Manufacturing (NAICS-31)		21,725		89,281
Wholesale trade (NAICS-42)		19,447		57,789
Retail trade (NAICS-44)		40,218		61,345
Transportation & warehousing (NAICS-48)		17,965		30,615
Information (NAICS-51)		27,359		22,620
Finance & insurance (NAICS-52)		61,927		23,755
Real estate & rental & leasing (NAICS-53)		13,549		11,562
Professional, scientific & technical services (NAICS-54)		72,718		40,109
Management of companies & enterprises (NAICS-55)		19,146		19,777
Admin, support, waste mgt, remediation services (NAICS-56)		42,227		55,682
Educational services (NAICS-61)		12,774		11,594
Health care and social assistance (NAICS-62)		51,480		66,885
Arts, entertainment & recreation (NAICS-71)		11,801		7,356
Accommodation & food services (NAICS-72)		64,008		38,404
Other services (except public administration) (NAICS-81)		22,476		27,119
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		6,567		7,247
Unclassified establishments (NAICS-99)		500-999		786
<i>Labor and Proprietor Income (\$1,000)</i>				
Agricultural Services, Forestry, and Fishing (SIC-07)	21,601		71,684	
Fishing, hunting and trapping (SIC-0900)			0	
Mining (SIC-10)	114,003		17,365	
Construction (SIC-15)	468,535		874,502	
Manufacturing (SIC-20)	1,267,611		3,026,292	
Transportation and Public Utilities (SIC-40)	1,757,112		1,340,249	
Wholesale Trade (SIC-50)	969,217		1,701,173	
Retail Trade (SIC-52)	1,319,076		1,647,771	
Finance, Insurance, and Real Estate (SIC-60)	3,845,805		900,022	
Services (SIC-70)	7,042,729		5,004,535	
Unclassified Establishments (SIC-99)	5,504		4,970	
Forestry, fishing, hunting, and agriculture support (NAICS-11)				
Fishing (NAICS-11411)				
Finfish fishing (NAICS-114111)				
shellfish fishing (NAICS-114112)				
Mining (NAICS-21)				97,150
Utilities (NAICS-22)				1,786,514
Construction (NAICS-23)		927,643		4,404,207
Manufacturing (NAICS-31)		607,984		2,667,487
Wholesale trade (NAICS-42)		1,028,598		1,508,196
Retail trade (NAICS-44)		1,035,218		1,077,418
Transportation & warehousing (NAICS-48)		592,376		1,429,370
Information (NAICS-51)		2,091,512		1,119,275
Finance & insurance (NAICS-52)		6,302,254		336,139
Real estate & rental & leasing (NAICS-53)		596,524		2,284,192
Professional, scientific & technical services (NAICS-54)		5,227,531		1,280,658
Management of companies & enterprises (NAICS-55)		1,347,715		1,866,658
Admin, support, waste mgt, remediation services (NAICS-56)		1,278,383		

San Francisco Bay Area California HMS Communities Demographic Profiles

	County			
	San Francisco		Alameda	
	1993	1999	1993	1999
Economic Activity (cont'd)				
<i>Labor and Proprietor Income (\$1,000) (cont'd)</i>				
Educational services (NAICS-61)		351,481		255,741
Health care and social assistance (NAICS-62)		1,721,254		2,309,581
Arts, entertainment & recreation (NAICS-71)		411,052		284,501
Accommodation & food services (NAICS-72)		1,223,145		504,936
Other services (except public administration) (NAICS-81)		579,655		660,050
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		399,099		432,127
Unclassified establishments (NAICS-99)				28,177
<i>Number of Establishments</i>				
Agricultural Services, Forestry, and Fishing (SIC-07)	137		398	
Fishing, hunting and trapping (SIC-0900)			1	
Mining (SIC-10)	28		14	
Construction (SIC-15)	1,333		2,631	
Manufacturing (SIC-20)	1,456		2,565	
Transportation and Public Utilities (SIC-40)	1,067		1,312	
Wholesale Trade (SIC-50)	2,038		3,247	
Retail Trade (SIC-52)	6,665		7,066	
Finance, Insurance, and Real Estate (SIC-60)	4,554		3,118	
Services (SIC-70)	12,512		12,925	
Unclassified Establishments (SIC-99)	223		298	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		9		31
Fishing (NAICS-11411)		4		2
Finfish fishing (NAICS-114111)				2
shellfish fishing (NAICS-114112)				
Mining (NAICS-21)		6		19
Utilities (NAICS-22)		16		16
Construction (NAICS-23)		1,558		2,790
Manufacturing (NAICS-31)		1,130		2,478
Wholesale trade (NAICS-42)		1,821		3,173
Retail trade (NAICS-44)		3,863		4,369
Transportation & warehousing (NAICS-48)		448		857
Information (NAICS-51)		1,080		797
Finance & insurance (NAICS-52)		2,303		1,586
Real estate & rental & leasing (NAICS-53)		1,571		1,693
Professional, scientific & technical services (NAICS-54)		5,510		4,404
Management of companies & enterprises (NAICS-55)		283		278
Admin, support, waste mgt, remediation services (NAICS-56)		1,557		1,858
Educational services (NAICS-61)		436		51
Health care and social assistance (NAICS-62)		2,781		3,682
Arts, entertainment & recreation (NAICS-71)		482		390
Accommodation & food services (NAICS-72)		3,239		2,743
Other services (except public administration) (NAICS-81)		2,557		3,284
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		59		130
Unclassified establishments (NAICS-99)		493		628

San Francisco Bay Area California HMS Communities Demographic Profiles

Major HMS Ports	San Fran., San Fran Co.		Oakland, Alameda Co.	
	1990	2000	1990	2000
Population (numbers)	Same as County	Same as County	372,242	399,484
<i>Gender (Percent total population)</i>				
Male			48.0%	48.3%
Female			52.0%	51.7%
<i>Race and Hispanic origin (Percent total population)</i>				
White			32.5%	31.3%
Black			43.9%	35.7%
Native American			0.6%	0.7%
Asian or Pacific Islander			14.8%	15.7%
Other Race			8.3%	11.7%
Hispanic Origin (any race)			13.9%	21.9%
<i>Age Structure (Percent total population)</i>				
Under 5 years			8.1%	7.1%
5-9 Years			7.1%	7.5%
10-14 Years			6.2%	6.6%
15-19 Years			6.2%	6.2%
20-24 Years			7.9%	7.2%
25-34 Years			19.0%	18.1%
35-44 Years			17.2%	15.8%
45-54 Years			9.3%	13.5%
55-59 Years			3.4%	4.3%
60-64 Years			3.6%	3.1%
65-74 Years			6.6%	5.2%
75-84 Years			4.0%	3.8%
85 Years and greater			1.4%	1.5%
Median Age (Years)			NA	33.3
18 Years and greater			75.1%	75.0%
Male			35.4%	35.6%
Female			39.7%	39.4%
21 Years and greater			70.9%	71.2%
62 Years and greater			14.3%	12.2%
65 Years and greater			12.0%	10.5%
Male			4.8%	4.2%
Female			7.3%	6.2%
Educational Attainment (Persons 25 years and over)				
Graduate or professional degree			7.2%	NA
Bachelor's degree			10.5%	NA
Associate's degree			4.3%	NA
Some college no degree			13.1%	NA
High school graduate			13.3%	NA
9th to 12th no diploma			8.9%	NA
Less than 9th grade			7.8%	NA
Economic Activity (Percent total population)				
<i>Labor Force by Gender (Persons 16 years and over)</i>				
Males			48.7%	NA
Females			25.3%	NA
			23.4%	NA

Source: U.S. Bureau of Census

A.4.3.11 HMS Community Profile: Moss Landing, Monterey County, CA

Monterey County

Traditionally, the economy of Monterey County has been comprised of three bases: Agriculture - primarily in the Salinas Valley; Tourism - primarily on the coastal areas; and Military - comprised of the Naval Postgraduate School, and the Defense Language Institute at the Presidio of Monterey.

Agriculture is the mainstay of the Monterey County economy. In 1997 agriculture accounted for 30% of the County's labor and proprietor income. Health care and social services, retail and wholesale trade, tourism and manufacturing were important contributors of non-agricultural income to the County's economy in 1999.

Moss Landing <http://www.monterey-bay.net/ml/>

Moss Landing was named after Captain Charles Moss who established shipping facilities and a pier to develop commercial water traffic from the area in the mid 1800s. During that period there was a whale processing plant, oyster farming, the Vierra's ferry across the slough mouth, diking for salt evaporation ponds, and commercial fishing. The Southern Pacific Railroad slowed the need for ocean shipping in the late 1800s. In the mid-1940s the Harbor was constructed and occupied by commercial fishing vessels. By 1950s, industry had moved into the area.

Moss Landing's harbor is one of the busiest harbors on the central coast. Dominated in numbers by commercial fishing vessels of various types, the catch includes salmon, albacore, rockfish, squid, flatfish, sablefish, shellfish, and a number of other species. There are two marine research and education institutions located here, Moss Landing Marine Laboratories (MLML) and Monterey Bay Aquarium Research Institute (MBARI), and both have large research ships in the harbor. MLML is a college field research station which studies a wide range of marine topics; MBARI is a deep-sea marine research facility.

Agriculture is one of the largest businesses outside of downtown Moss Landing. There are a number of crops including cauliflower, spinach, broccoli, Brussel sprouts, strawberries, artichokes and squash.

Moss Landing is home to two major industrial complexes. Mighty Moss is the Duke Energy Power Services' electricity generating steam turbine plant. The plant's two large stacks serve as a landmark for the town. National Refractors & Minerals produces fire bricks, magnesia chemicals and other refractory specialties.

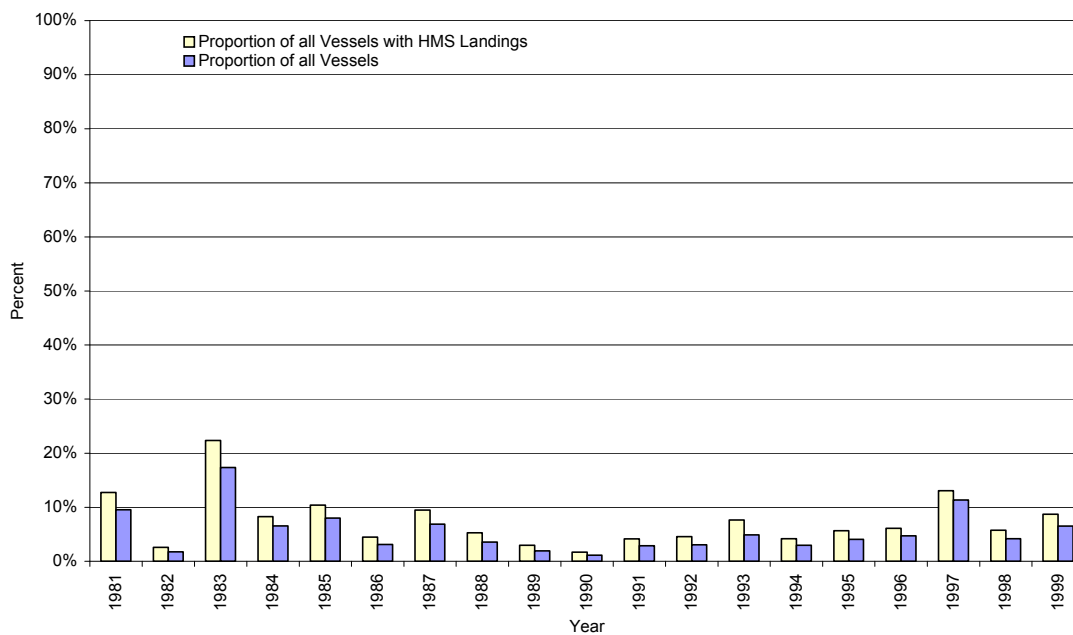
Number of vessels with HMS landings, for which Moss Landing, CA is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	58	0		0	0		36
1982	9	0		0	0		31
1983	110	0		0	4		55
1984	33	0		0	0		25
1985	33	0		0	0		37
1986	11	0		0	1		31
1987	20	0		1	4		28
1988	6	0		0	6		26
1989	4	0		0	2		20
1990	3	0		1	0		16
1991	2	0		0	8		17
1992	3	0		3	4		17
1993	11	0		2	7		17
1994	6	0		0	2		12
1995	5	0		0	10		21
1996	11	0		0	8		13
1997	41	0		0	6		36
1998	6	0		0	6		17
1999	15	2		0	3		16

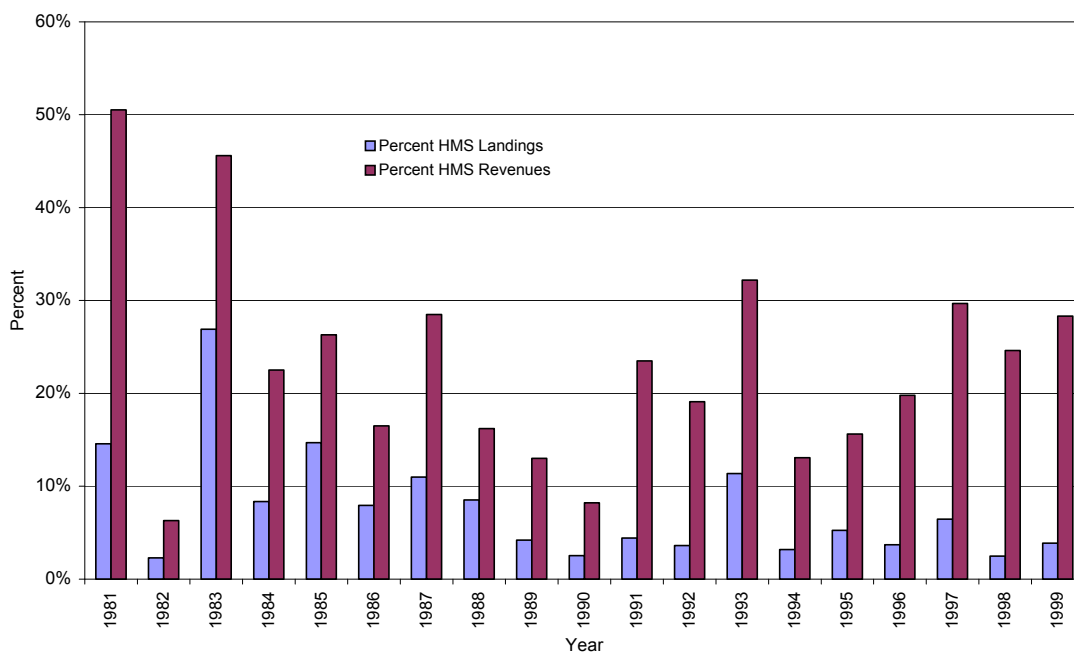
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Moss Landing, CA, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	456	1439					30	6622
1982	350	176			8	2		6201
1983	510	1684			12	65	5	3410
1984	399	544			7	38		4731
1985	317	653			29	39		3313
1986	268	459			12	37		4436
1987	264	542			7	63		2927
1988	228	254			4	69	1	2462
1989	204	95			3	52		2333
1990	235	67			24	27	2	3219
1991	241	23			29	114	2	2873
1992	219	93	3		7	85	1	4610
1993	262	266	11		7	124	2	2037
1994	191	149	2		6	52		3853
1995	265	185	7		22	115		4003
1996	311	185	12		16	212		6154
1997	360	1050	19		47	187	4	9402
1998	208	91	12		33	164	7	3882
1999	229	460	106	3	11	127	7	4085
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	456	\$4,825,677		\$34	\$406		\$69,564	\$3,455,853
1982	350	\$400,998			\$12,724	\$15,960	\$310	\$4,982,761
1983	510	\$3,244,401		\$14	\$19,154	\$341,949	\$6,610	\$3,126,947
1984	399	\$914,544			\$13,066	\$184,510	\$53	\$2,805,535
1985	317	\$995,244	\$138		\$55,135	\$209,394	\$1,251	\$2,707,655
1986	268	\$716,607			\$26,402	\$242,941	\$1,313	\$3,530,147
1987	264	\$1,199,150	\$75		\$17,515	\$535,891	\$472	\$2,841,970
1988	228	\$632,414			\$8,238	\$452,251	\$5,109	\$4,288,133
1989	204	\$182,000			\$7,377	\$368,932	\$815	\$2,557,226
1990	235	\$170,547	\$730		\$47,698	\$153,822	\$1,464	\$3,029,031
1991	241	\$38,560	\$1,950		\$43,976	\$796,815	\$7,600	\$2,390,348
1992	219	\$246,010	\$9,809		\$8,922	\$449,036	\$3,645	\$2,721,169
1993	262	\$722,672	\$40,771		\$12,066	\$646,551	\$7,123	\$2,383,535
1994	191	\$303,617	\$14,958		\$12,072	\$334,427	\$2,412	\$3,248,714
1995	265	\$347,331	\$36,468		\$43,389	\$693,167	\$870	\$4,890,281
1996	311	\$342,529	\$45,474		\$27,752	\$1,197,746		\$5,121,496
1997	360	\$1,851,786	\$88,867		\$77,784	\$846,803	\$24,464	\$5,209,774
1998	208	\$123,804	\$59,311	\$2,324	\$52,673	\$720,743	\$36,924	\$2,182,383
1999	229	\$753,923	\$430,020	\$5,620	\$22,136	\$465,779	\$46,132	\$2,970,166

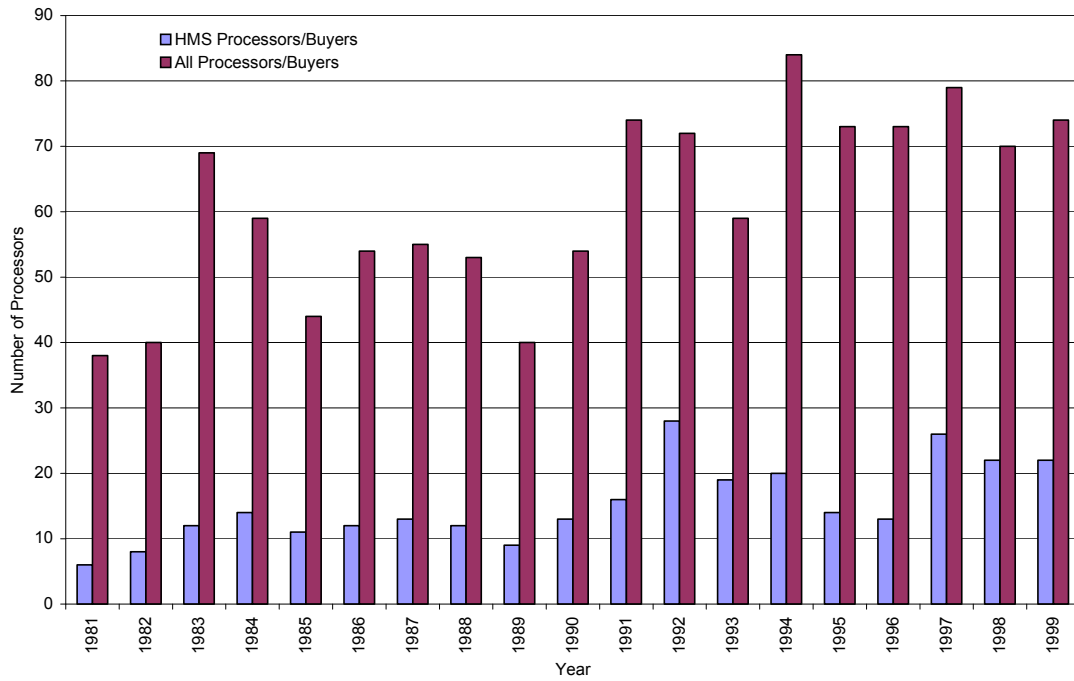
Proportion of vessels whose principal species is a HMS and whose principal port is Moss Landing, CA of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in Moss Landing, 1981-99.



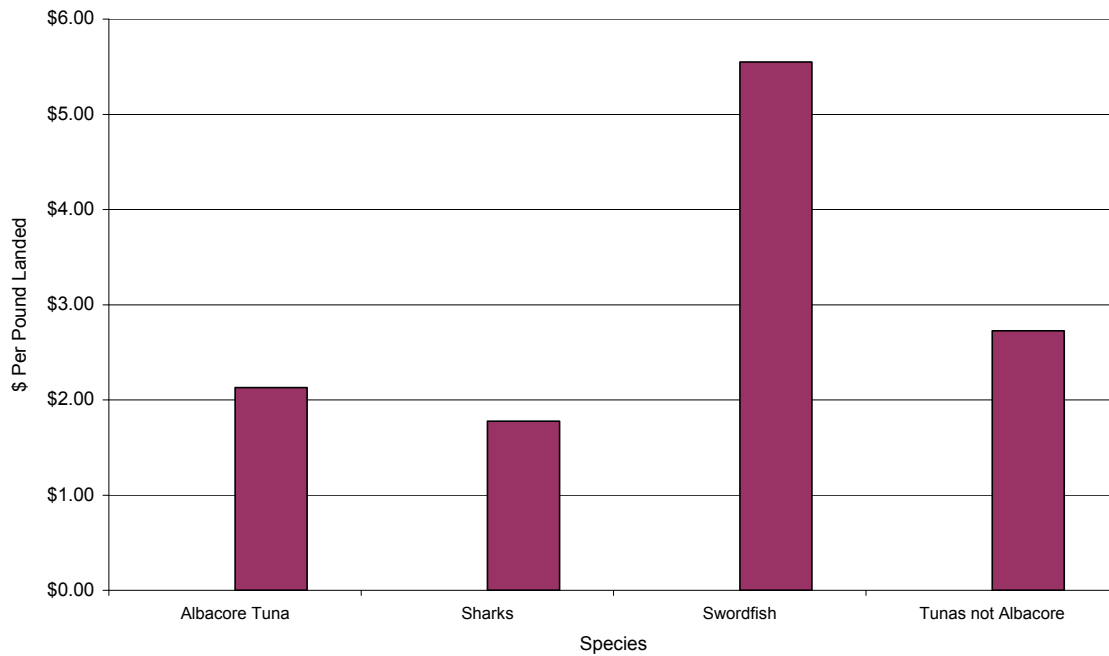
Proportion of HMS landings and exvessel revenues of total landings and esvessel revenues in Moss Landing, CA, 1981_99



Number of processors/buyers in Moss Landing, CA, 1981-99.



Total income multipliers for landings of HMS of species in the port of Moss Landing, CA, based on 1996 landings and exvessel revenues.



A.4.3.12 HMS Community Profile: Monterey, Monterey County, CA

Monterey <http://www.mpcc.com/index.cb.cfm>

The city of Monterey covers 8.62 square miles and has a population of approximately 33,000; population increases to nearly 70,000 during tourist seasons. Originally inhabited by Native Americans, the Monterey Peninsula was sighted by the first European in 1542. Juan Rodriguez Cabrillo, a Portuguese explorer seeking riches in the new world, came upon the windswept Peninsula and claimed it for the Crown. High seas, however, prevented him from landing, and it was not until sixty years later that a Spaniard, Sebastian Vizcaino, set foot on the Peninsula. He named the area after the Count of Monte Rey under whose order he was sailing.

Colonization began in 1770 when Spanish expedition commander Caspar de Portola and Franciscan father Junipero Serra proclaimed the area the military and ecclesiastical capital of Alta (upper) California. Governor Portola constructed the first of four California presidios, and Father Serra established the Mission San Carlos de Borromeo.

In 1822 when Mexico gained its independence from Spain, Monterey became the Mexican capital, land was redistributed, and huge cattle ranches appeared. Mexican rule ended June 7, 1846, when Commodore John Drake Sloat raised the American flag over Monterey's Custom House. Three years later, 48 California delegates convened at Colton Hall to draft a state constitution. California became the 31st state of the Union in 1850.

Monterey served as California's first capital and hosted California's first constitutional convention in the City's historic Colton Hall, where on October 13, 1849, our state constitution was signed. In the 1930s and 1940s, Monterey became the center of a thriving fishing industry at Cannery Row. Today a smaller commercial fishing fleet and industry continues to operate from the City's harbor marina. Due to its strategic location, Monterey has historically been a key military outpost. While military needs have changed, the presence of the Naval Postgraduate School and Defense Language Institute in Monterey continues this legacy of military tradition.

With the significant downsizing of Fort Ord during 1993, and the relocation of its 13,000 soldiers and their dependents, the community looked to replace the Military "industry" with an Educational industry, as a compatible third element of our economy. These efforts have far-reaching implications and impacts, but are strongly supported by a broad cross-section of the community.

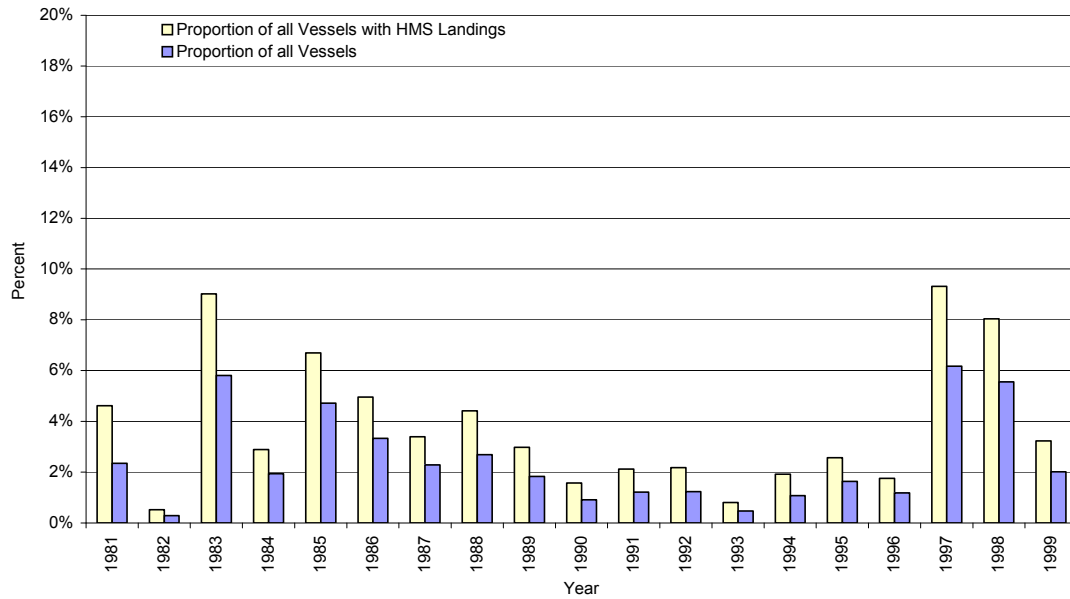
Number of vessels with HMS landings, for which Monterey, CA is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	9				0		7
1982	1				0		9
1983	16				8		49
1984	5				2		39
1985	12				4		58
1986	5				6		24
1987	1				8		23
1988	0				8		15
1989	0				6		9
1990	0				3		4
1991	0				4		6
1992	0				3		5
1993	0				1		6
1994	0				2		3
1995	0				3		8
1996	0				2		10
1997	10				1		24
1998	6				1		14
1999	2				0		12

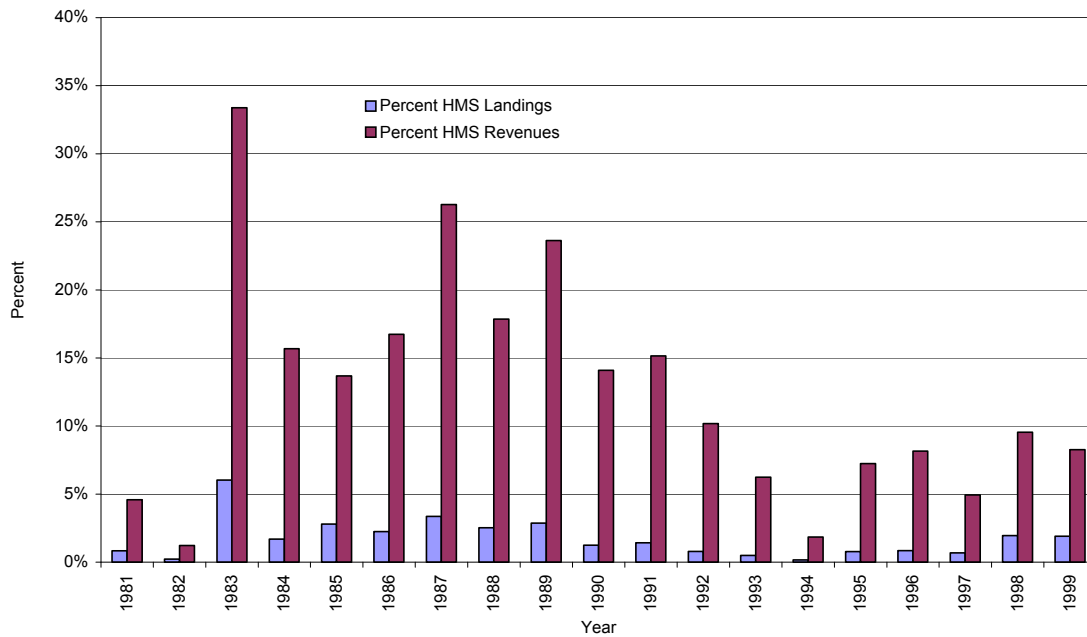
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Monterey, CA, 1981-99.

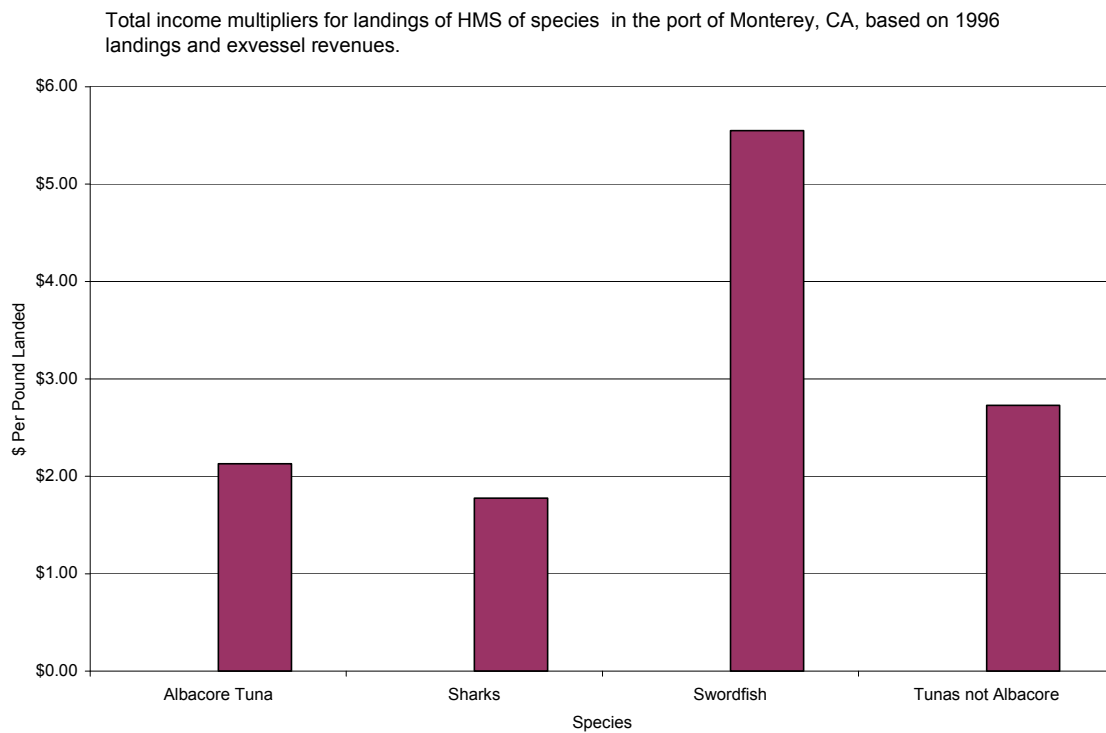
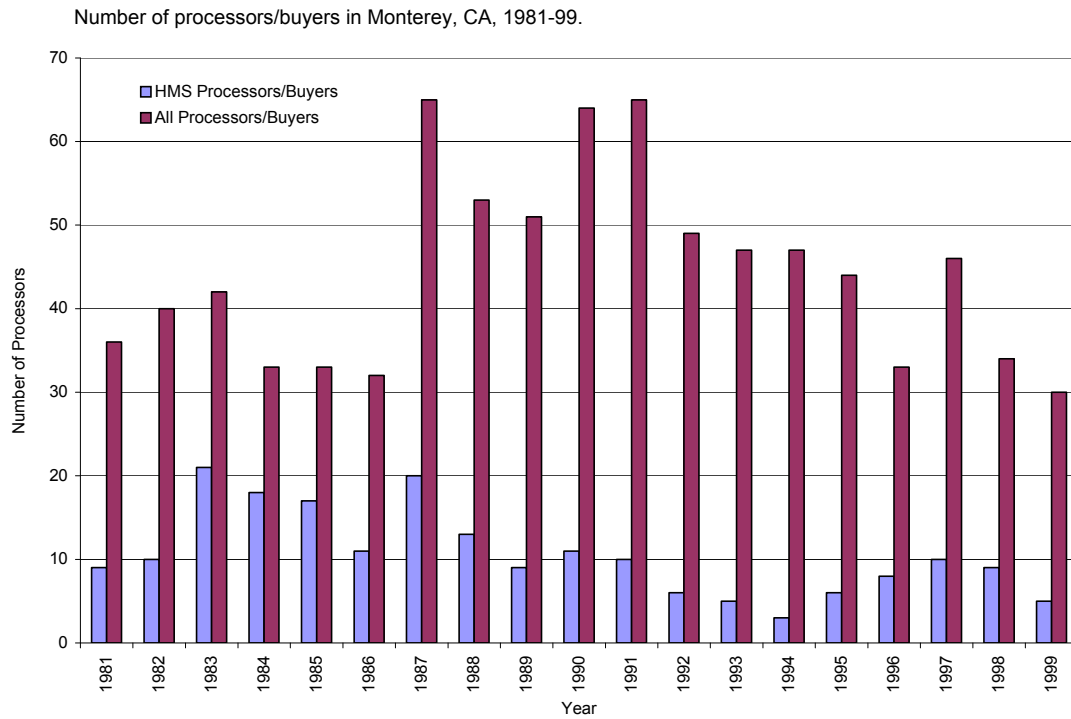
Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	195	129						12285
1982	192	19			9	4		11541
1983	266	160			83	253	2	6944
1984	242	44			61	129		12679
1985	239	78			58	99		6889
1986	222	32			27	122		6277
1987	265	44			36	173		5801
1988	181	22			23	119	2	4961
1989	201	4			48	174		6126
1990	191	5	1		40	84		7623
1991	189	4			42	79	1	5606
1992	138				10	51	2	4533
1993	124	1			2	34	1	5166
1994	104	2			3	17		8493
1995	117	4			9	53		5579
1996	114	21			16	59		6071
1997	118	53	3		8	30		7014
1998	87	19	1		4	36		2285
1999	62	21			4	25		1438
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	195	\$433,036			\$5			\$7,080,804
1982	192	\$54,173			\$14,193	\$27,864	\$1,110	\$6,023,327
1983	266	\$307,162	\$44		\$136,813	\$1,330,022	\$6,800	\$2,727,538
1984	242	\$72,808	\$600		\$100,030	\$687,088	\$915	\$3,728,109
1985	239	\$119,064	\$37		\$117,519	\$569,704	\$1,107	\$4,175,562
1986	222	\$50,865	\$257		\$65,991	\$845,486	\$1,323	\$3,590,583
1987	265	\$96,013	\$88		\$91,129	\$1,397,035	\$3,755	\$3,283,246
1988	181	\$54,866	\$405		\$56,390	\$898,704	\$8,944	\$3,360,268
1989	201	\$9,457	\$497		\$121,241	\$1,337,349	\$430	\$3,183,376
1990	191	\$11,254	\$4,695		\$80,589	\$561,207	\$1,957	\$2,892,205
1991	189	\$5,991	\$753	\$7	\$70,274	\$553,533	\$3,976	\$2,289,976
1992	138	\$1,249	\$1,131		\$19,923	\$278,690	\$6,035	\$1,742,355
1993	124	\$2,066	\$1,852		\$3,357	\$205,350	\$4,835	\$2,426,845
1994	104	\$5,151	\$3,898		\$5,569	\$111,771		\$3,790,707
1995	117	\$7,629	\$697		\$15,803	\$329,920	\$1,633	\$3,518,794
1996	114	\$33,648	\$1,690		\$29,554	\$326,519	\$529	\$2,503,524
1997	118	\$76,988	\$10,912		\$15,398	\$153,739	\$708	\$2,863,254
1998	87	\$22,701	\$5,433		\$7,045	\$161,887	\$255	\$1,361,724
1999	62	\$28,107	\$2,777		\$6,730	\$112,983	\$258	\$1,095,755

Proportion of vessels whose principal species is a HMS and whose principal port is Monterey, CA of all vessels making HMS landings, and proportion of these vessels of the total number of vessels making landings in Monterey, 1981-99.



Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Monterey, CA, 1981-99.





Monterey County California HMS Communities Demographic Profiles

	County	
	Monterey	
	1990	2000
Population (numbers)	355,660	401,762
<i>Gender (Percent total population)</i>		
Male	51.9%	51.8%
Female	48.1%	48.2%
<i>Race and Hispanic origin (Percent total population)</i>		
White	63.8%	55.9%
Black	6.4%	3.7%
Native American	0.8%	1.0%
Asian or Pacific Islander	7.8%	6.5%
Other Race	21.1%	27.8%
Hispanic Origin (any race)	33.6%	46.8%
<i>Age Structure (Percent total population)</i>		
Under 5 years	8.8%	7.8%
5-9 Years	8.0%	8.3%
10-14 Years	6.9%	7.8%
15-19 Years	7.4%	7.7%
20-24 Years	9.6%	7.7%
25-34 Years	19.5%	15.9%
35-44 Years	14.7%	15.4%
45-54 Years	8.4%	12.3%
55-59 Years	3.5%	4.0%
60-64 Years	3.5%	3.1%
65-74 Years	5.8%	5.3%
75-84 Years	3.0%	3.5%
85 Years and greater	0.9%	1.2%
Median Age (years)	NA	31.7
18 Years and greater	72.5%	71.6%
Male	37.8%	37.1%
Female	34.7%	34.5%
21 Years and greater	67.0%	66.9%
62 Years and greater	11.8%	11.8%
65 Years and greater	9.8%	10.0%
Male	4.1%	4.3%
Female	5.7%	5.8%
<i>Educational Attainment (Persons 25 years and over)</i>		
Graduate or professional degree	4.5%	NA
Bachelor's degree	8.3%	NA
Associate's degree	4.4%	NA
Some college no degree	13.6%	NA
High school graduate	12.6%	NA
9th to 12th no diploma	6.9%	NA
Less than 9th grade	9.3%	NA
Economic Activity		
<i>Labor Force by Gender (Persons 16 years and over)</i>	51.3%	NA
Males	30.1%	NA
Females	21.2%	NA

Monterey County California HMS Communities Demographic Profiles

	County	
	Monterey	
	1993	1999
Economic Activity (cont'd)		
<i>Employment (numbers)</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	1,787	
Fishing, hunting and trapping (SIC-0900)	0-19	
Mining (SIC-10)	151	
Construction (SIC-15)	3,754	
Manufacturing (SIC-20)	7,738	
Transportation and Public Utilities (SIC-40)	5,247	
Wholesale Trade (SIC-50)	6,315	
Retail Trade (SIC-52)	24,260	
Finance, Insurance, and Real Estate (SIC-60)	7,547	
Services (SIC-70)	32,395	
Unclassified Establishments (SIC-99)	55	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		3,640
Fishing (NAICS-11411)		20-99
Finfish fishing (NAICS-114111)		20-99
shellfish fishing (NAICS-114112)		0-19
Mining (NAICS-21)		108
Utilities (NAICS-22)		715
Construction (NAICS-23)		6,225
Manufacturing (NAICS-31)		6,755
Wholesale trade (NAICS-42)		6,720
Retail trade (NAICS-44)		16,970
Transportation & warehousing (NAICS-48)		2,323
Information (NAICS-51)		2,944
Finance & insurance (NAICS-52)		4,794
Real estate & rental & leasing (NAICS-53)		1,929
Professional, scientific & technical services (NAICS-54)		3,714
Management of companies & enterprises (NAICS-55)		625
Admin, support, waste mgt, remediation services (NAICS-56)		6,532
Educational services (NAICS-61)		2,390
Health care and social assistance (NAICS-62)		12,099
Arts, entertainment & recreation (NAICS-71)		2,093
Accommodation & food services (NAICS-72)		17,885
Other services (except public administration) (NAICS-81)		5,122
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		770
Unclassified establishments (NAICS-99)		167
<i>Labor and Proprietor Income (\$1,000)</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	44,125	
Fishing, hunting and trapping (SIC-0900)	0	
Mining (SIC-10)	5,122	
Construction (SIC-15)	102,335	
Manufacturing (SIC-20)	235,774	
Transportation and Public Utilities (SIC-40)	153,476	
Wholesale Trade (SIC-50)	204,892	
Retail Trade (SIC-52)	348,612	
Finance, Insurance, And Real Estate (SIC-60)	182,023	
Services (SIC-70)	665,237	
Unclassified Establishments (SIC-99)	667	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		105,100
Fishing (NAICS-11411)		0
Finfish fishing (NAICS-114111)		0
shellfish fishing (NAICS-114112)		0

Monterey County California HMS Communities Demographic Profiles

	County	
	Monterey	
	1993	1999
<i>Labor and Proprietor Income (\$1,000) (cont'd)</i>		
Mining (NAICS-21)		5,258
Utilities (NAICS-22)		42,803
Construction (NAICS-23)		207,398
Manufacturing (NAICS-31)		227,390
Wholesale trade (NAICS-42)		271,854
Retail trade (NAICS-44)		391,844
Transportation & warehousing (NAICS-48)		66,417
Information (NAICS-51)		116,146
Finance & insurance (NAICS-52)		216,254
Real estate & rental & leasing (NAICS-53)		48,389
Professional, scientific & technical services (NAICS-54)		156,383
Management of companies & enterprises (NAICS-55)		38,640
Admin, support, waste mgt, remediation services (NAICS-56)		136,091
Educational services (NAICS-61)		52,213
Health care and social assistance (NAICS-62)		431,427
Arts, entertainment & recreation (NAICS-71)		49,145
Accommodation & food services (NAICS-72)		302,271
Other services (except public administration) (NAICS-81)		95,339
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		28,388
Unclassified establishments (NAICS-99)		4,270
<i>Number of Establishments</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	226	
Fishing, hunting and trapping (SIC-0900)	7	
Mining (SIC-10)	10	
Construction (SIC-15)	760	
Manufacturing (SIC-20)	287	
Transportation and Public Utilities (SIC-40)	333	
Wholesale Trade (SIC-50)	532	
Retail Trade (SIC-52)	2,259	
Finance, Insurance, And Real Estate (SIC-60)	769	
Services (SIC-70)	2,903	
Unclassified Establishments (SIC-99)	53	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		87
Fishing (NAICS-11411)		5
Finfish fishing (NAICS-114111)		3
shellfish fishing (NAICS-114112)		2
Mining (NAICS-21)		10
Utilities (NAICS-22)		23
Construction (NAICS-23)		870
Manufacturing (NAICS-31)		296
Wholesale trade (NAICS-42)		469
Retail trade (NAICS-44)		1,535
Transportation & warehousing (NAICS-48)		248
Information (NAICS-51)		144
Finance & insurance (NAICS-52)		400
Real estate & rental & leasing (NAICS-53)		391
Professional, scientific & technical services (NAICS-54)		770
Management of companies & enterprises (NAICS-55)		29
Admin, support, waste mgt, remediation services (NAICS-56)		452
Educational services (NAICS-61)		75
Health care and social assistance (NAICS-62)		837
Arts, entertainment & recreation (NAICS-71)		130
Accommodation & food services (NAICS-72)		885
Other services (except public administration) (NAICS-81)		710
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		17
Unclassified establishments (NAICS-99)		141

Monterey County California HMS Communities Demographic Profiles

Major HMS Ports	Moss Landing, Monterey Co.		Monterey, Monterey Co.	
	1990	2000	1990	2000
Population (numbers)	NA	300	31,954	29,674
<i>Gender (Percent total population)</i>				
Male	NA	54.0%	50.7%	49.2%
Female	NA	46.0%	49.3%	50.8%
<i>Race and Hispanic origin (Percent total population)</i>				
White	NA		86.6%	80.8%
Black	NA	59.3%	2.9%	2.5%
Native American	NA	3.0%	0.6%	0.6%
Asian or Pacific Islander	NA	0.7%	7.3%	7.7%
Other Race	NA	2.0%	2.6%	3.9%
Hispanic Origin (any race)	NA	21.7%	7.8%	10.9%
<i>Age Structure (Percent total population)</i>		28.3%		
Under 5 years	NA	0.0%		
5-9 Years	NA	4.7%	7.0%	5.0%
10-14 Years	NA	4.3%	5.2%	4.8%
15-19 Years	NA	8.7%	3.6%	4.3%
20-24 Years	NA	5.3%	7.5%	6.6%
25-34 Years	NA	10.0%	10.2%	9.1%
35-44 Years	NA	14.0%	24.1%	18.1%
45-54 Years	NA	20.3%	14.5%	15.6%
55-59 Years	NA	13.0%	7.9%	13.6%
60-64 Years	NA	4.7%	3.5%	4.3%
65-74 Years	NA	4.0%	3.6%	3.8%
75-84 Years	NA	7.0%	7.3%	6.7%
85 Years and greater	NA	3.0%	4.1%	5.7%
Median Age (Years)	NA	1.0%	1.5%	2.5%
18 Years and greater	NA	36.4	NA	36.1
Male	NA	78.7%	81.8%	83.4%
Female	NA	42.7%	41.5%	40.9%
21 Years and greater	NA	36.0%	40.3%	42.5%
62 Years and greater	NA	76.3%	74.5%	77.2%
65 Years and greater	NA	13.7%	15.0%	17.0%
Male	NA	11.0%	12.9%	14.9%
Female	NA	7.0%	5.0%	5.9%
	NA	4.0%	7.9%	9.0%
Educational Attainment (Persons 25 years and over)				
Graduate or professional degree	NA	NA	10.2%	NA
Bachelor's degree	NA	NA	16.4%	NA
Associate's degree	NA	NA	5.2%	NA
Some college no degree	NA	NA	15.2%	NA
High school graduate	NA	NA	12.2%	NA
9th to 12th no diploma	NA	NA	4.5%	NA
Less than 9th grade	NA	NA	3.2%	NA
Economic Activity (Percent total population)				
<i>Labor Force by Gender (Persons 16 years and over)</i>	NA	NA	61.0%	NA
Males	NA	NA	34.9%	NA
Females	NA	NA	26.1%	NA

Source: U.S. Bureau of Census

A.4.3.13 HMS Community Profile: Morro Bay, San Luis Obispo County, CA

San Luis Obispo County

Agriculture is an important component of the San Luis Obispo County economy. In 1997, agriculture accounted for 11% of the County's total labor and proprietor income. In 1999, health care and social assistance was the County's most important economic sector in terms of non-agricultural income followed by retail trade, manufacturing, construction and tourism.

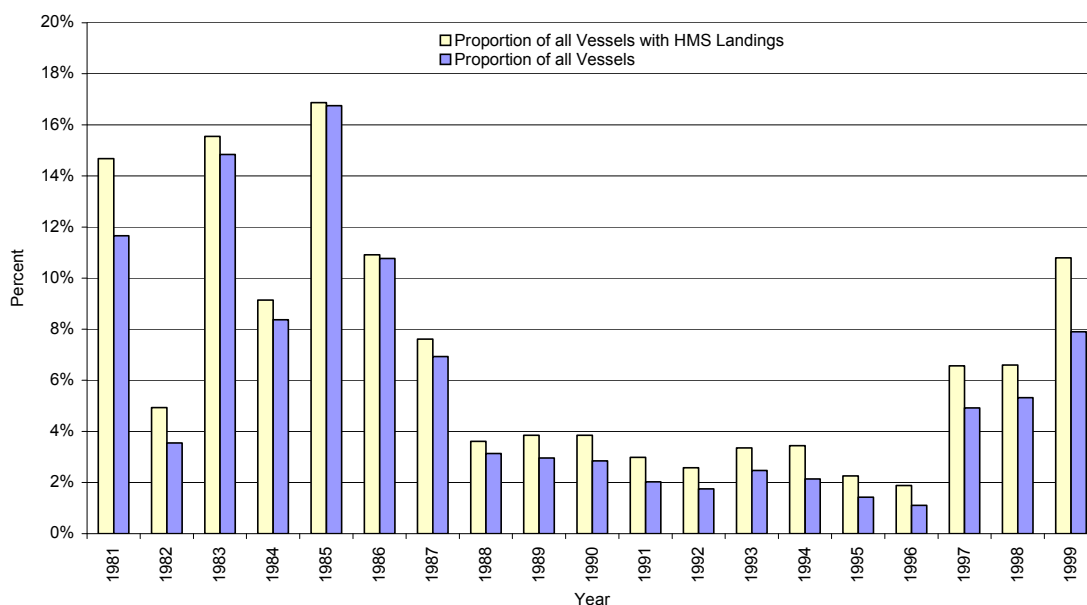
Number of vessels with HMS landings, for which Morro Bay, CA is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	64			0	0	0	53
1982	16			0	1	1	52
1983	65			1	6	0	82
1984	31			0	5	0	53
1985	41			1	26	0	46
1986	30			0	18	1	56
1987	15			0	15	0	54
1988	6			1	7	0	28
1989	5			0	8	0	43
1990	0			0	14	0	37
1991	1			1	8	0	20
1992	3			0	6	0	32
1993	3			2	7	0	26
1994	0			3	7	0	22
1995	2			1	4	0	31
1996	2			1	2	0	25
1997	17			2	2	0	51
1998	14			1	4	0	60
1999	14			2	6	1	34

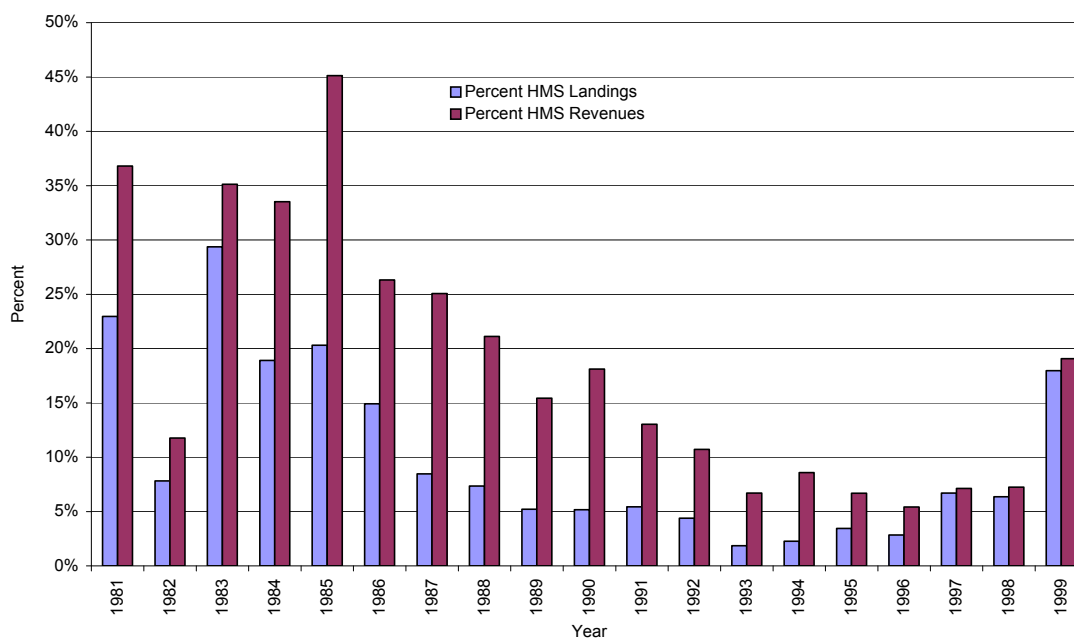
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Morro Bay, CA, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	436	979			10			2997
1982	365	123			167	24		3355
1983	463	861			391	71	6	2769
1984	394	296			303	218	2	2555
1985	403	371	1		268	838	4	4024
1986	449	424			50	381	2	4037
1987	394	192			89	271	3	4755
1988	388	85			53	283	4	4152
1989	338	106			78	145		4916
1990	364	41	3		81	221	1	5270
1991	335	35			114	101	3	3637
1992	349	20	1		78	136	3	4356
1993	357	17	7		11	82	4	5722
1994	290	13	3		16	86	2	4733
1995	310	14	2		47	93		3985
1996	265	33	14		19	48		3623
1997	320	183	5		36	24		3094
1998	288	65	3		32	80	2	2181
1999	213	146	6		18	134	4	1205
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	436	\$3,289,678			\$15,798	\$3,929	\$657	\$4,879,896
1982	365	\$299,239	\$17	\$20	\$306,221	\$157,261	\$905	\$4,838,476
1983	463	\$1,673,646	\$283		\$693,999	\$403,462	\$11,517	\$4,236,827
1984	394	\$511,021	\$874		\$512,689	\$1,298,741	\$3,483	\$3,570,092
1985	403	\$559,765	\$3,810		\$578,805	\$4,251,676	\$8,549	\$5,040,171
1986	449	\$688,363	\$403		\$118,978	\$2,389,857	\$5,450	\$7,777,112
1987	394	\$438,387	\$1,080		\$235,373	\$2,214,524	\$9,594	\$7,205,968
1988	388	\$222,335	\$825		\$130,159	\$1,948,124	\$13,871	\$7,012,862
1989	338	\$234,230	\$1,437		\$172,719	\$1,064,204	\$2,556	\$6,785,330
1990	364	\$95,238	\$11,216	\$18	\$169,850	\$1,500,360	\$4,901	\$6,702,318
1991	335	\$63,725	\$3,462		\$194,922	\$682,821	\$6,732	\$5,320,448
1992	349	\$56,035	\$2,466		\$119,359	\$666,390	\$8,776	\$5,838,752
1993	357	\$46,421	\$26,433		\$22,150	\$414,485	\$16,508	\$6,215,464
1994	290	\$29,950	\$13,305		\$34,145	\$582,198	\$6,380	\$6,194,039
1995	310	\$29,633	\$8,260		\$79,155	\$559,441	\$973	\$7,896,665
1996	265	\$67,707	\$42,344		\$36,224	\$259,886	\$539	\$5,700,880
1997	320	\$294,689	\$16,016		\$72,713	\$105,725	\$344	\$4,974,516
1998	288	\$121,132	\$11,822		\$52,579	\$282,160	\$2,673	\$4,129,168
1999	213	\$200,985	\$26,709	\$1,808	\$28,060	\$604,815	\$20,400	\$2,521,720

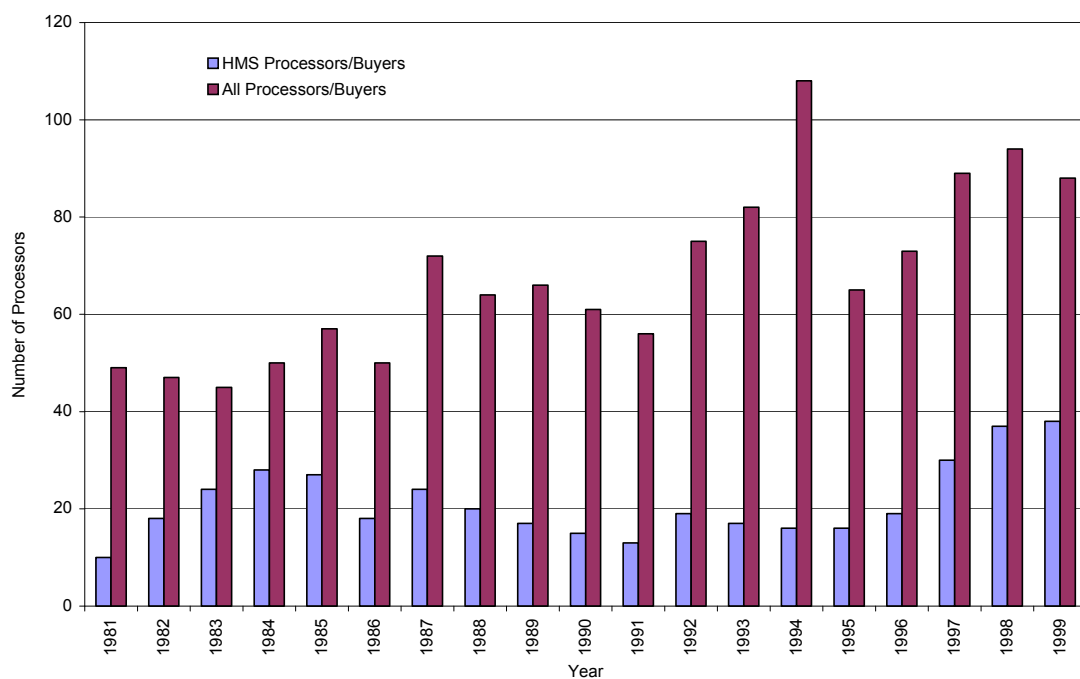
Proportion of vessels whose principal species is a HMS and whose principal port is Morro Bay, CA of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in Morro Bay, 1981-99.



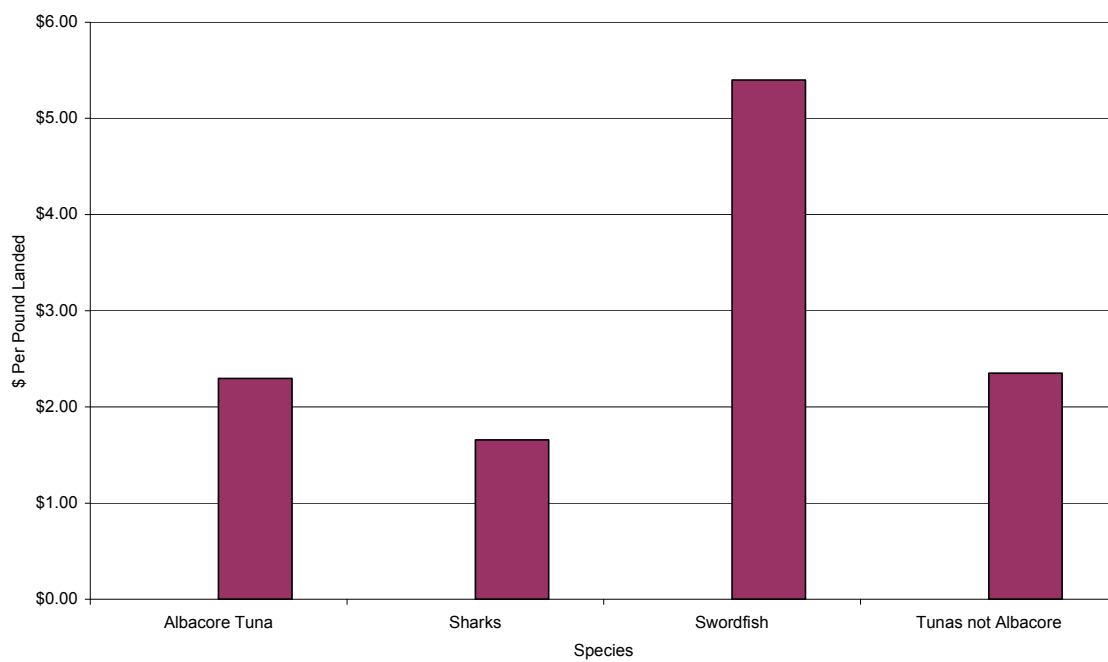
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Morro Bay, CA, 1981-99.



Number of processors/buyers in Morro Bay, CA, 1981-99.



Total income multipliers for landings of HMS of species in the port of Morro Bay, CA, based on 1996 landings and exvessel revenues.



San Luis Obispo County California HMS Communities Demographic Profiles

	County	
	San Luis Obispo	
	1990	2000
Population (numbers)	217,162	246,681
<i>Gender (Percent total population)</i>		
Male	51.6%	51.4%
Female	48.4%	48.6%
<i>Race and Hispanic origin (Percent total population)</i>		
White	89.2%	84.6%
Black	2.6%	2.0%
Native American	1.0%	0.9%
Asian or Pacific Islander	2.9%	2.8%
Other Race	4.3%	6.2%
Hispanic Origin (any race)	13.3%	16.3%
<i>Age Structure (Percent total population)</i>		
Under 5 years	6.4%	5.0%
5-9 Years	6.6%	6.0%
10-14 Years	5.7%	6.6%
15-19 Years	7.3%	8.5%
20-24 Years	10.4%	9.2%
25-34 Years	16.9%	11.4%
35-44 Years	15.8%	15.6%
45-54 Years	8.8%	14.7%
55-59 Years	3.6%	4.8%
60-64 Years	4.2%	3.8%
65-74 Years	8.4%	7.3%
75-84 Years	4.5%	5.4%
85 Years and greater	1.3%	1.7%
Median Age (years)	NA	37.3
18 Years and greater	78.1%	78.3%
Male	40.2%	40.2%
Female	37.9%	38.2%
21 Years and greater	71.7%	71.7%
62 Years and greater	16.8%	16.7%
65 Years and greater	14.2%	14.5%
Male	6.2%	6.3%
Female	8.0%	8.2%
<i>Educational Attainment (Persons 25 years and over)</i>	1990	2000
Graduate or professional degree	4.7%	NA
Bachelor's degree	9.9%	NA
Associate's degree	5.6%	NA
Some college no degree	17.3%	NA
High school graduate	15.7%	NA
9th to 12th no diploma	7.1%	NA
Less than 9th grade	3.6%	NA
Economic Activity		
<i>Labor Force by Gender (Persons 16 years and over)</i>	47.5%	NA
Males	26.1%	NA
Females	21.4%	NA

San Luis Obispo County California HMS Communities Demographic Profiles

	County	
	San Luis Obispo	
	1993	1999
Economic Activity (cont'd)		
<i>Employment (numbers)</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	961	
Fishing, hunting and trapping (SIC-0900)	10	
Mining (SIC-10)	71	
Construction (SIC-15)	3,034	
Manufacturing (SIC-20)	5,711	
Transportation and Public Utilities (SIC-40)	4,763	
Wholesale Trade (SIC-50)	2,269	
Retail Trade (SIC-52)	17,332	
Finance, Insurance, and Real Estate (SIC-60)	3,143	
Services (SIC-70)	21,222	
Unclassified Establishments (SIC-99)	19	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		100-249
Fishing (NAICS-11411)		0-19
Finfish fishing (NAICS-114111)		0-19
shellfish fishing (NAICS-114112)		0-19
Mining (NAICS-21)		100-249
Utilities (NAICS-22)		2500-4999
Construction (NAICS-23)		5,418
Manufacturing (NAICS-31)		6,894
Wholesale trade (NAICS-42)		1,978
Retail trade (NAICS-44)		12,020
Transportation & warehousing (NAICS-48)		1,216
Information (NAICS-51)		1,822
Finance & insurance (NAICS-52)		2,385
Real estate & rental & leasing (NAICS-53)		1,432
Professional, scientific & technical services (NAICS-54)		3,145
Management of companies & enterprises (NAICS-55)		287
Admin, support, waste mgt, remediation services (NAICS-56)		3,065
Educational services (NAICS-61)		2,369
Health care and social assistance (NAICS-62)		12,426
Arts, entertainment & recreation (NAICS-71)		749
Accommodation & food services (NAICS-72)		10,801
Other services (except public administration) (NAICS-81)		3,581
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		166
Unclassified establishments (NAICS-99)		100-249
<i>Labor and Proprietor Income (\$1,000)</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	13,878	
Fishing, hunting and trapping (SIC-0900)	196	
Mining (SIC-10)	2,148	
Construction (SIC-15)	72,722	
Manufacturing (SIC-20)	132,199	
Transportation and Public Utilities (SIC-40)	186,794	
Wholesale Trade (SIC-50)	54,524	
Retail Trade (SIC-52)	216,756	
Finance, Insurance, and Real Estate (SIC-60)	72,498	
Services (SIC-70)	405,163	
Unclassified Establishments (SIC-99)	470	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		0
Fishing (NAICS-11411)		0
Finfish fishing (NAICS-114111)		0
shellfish fishing (NAICS-114112)		0

San Luis Obispo County California HMS Communities Demographic Profiles

	County	
	San Luis Obispo	
	1993	1999
Economic Activity (cont'd)		
<i>Labor and Proprietor Income (\$1,000) (cont'd)</i>		
Mining (NAICS-21)		0
Utilities (NAICS-22)		0
Construction (NAICS-23)		156,010
Manufacturing (NAICS-31)		209,311
Wholesale trade (NAICS-42)		58,482
Retail trade (NAICS-44)		236,909
Transportation & warehousing (NAICS-48)		30,329
Information (NAICS-51)		104,489
Finance & insurance (NAICS-52)		90,129
Real estate & rental & leasing (NAICS-53)		28,017
Professional, scientific & technical services (NAICS-54)		112,983
Management of companies & enterprises (NAICS-55)		14,638
Admin, support, waste mgt, remediation services (NAICS-56)		69,524
Educational services (NAICS-61)		27,009
Health care and social assistance (NAICS-62)		342,637
Arts, entertainment & recreation (NAICS-71)		11,181
Accommodation & food services (NAICS-72)		126,943
Other services (except public administration) (NAICS-81)		56,855
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		3,787
Unclassified establishments (NAICS-99)		0
<i>Number of Establishments</i>		
Agricultural Services, Forestry, And Fishing (SIC-07)	164	
Fishing, hunting and trapping (SIC-0900)	7	
Mining (SIC-10)	14	
Construction (SIC-15)	704	
Manufacturing (SIC-20)	295	
Transportation And Public Utilities (SIC-40)	202	
Wholesale Trade (SIC-50)	282	
Retail Trade (SIC-52)	1,586	
Finance, Insurance, And Real Estate (SIC-60)	512	
Services (SIC-70)	2,177	
Unclassified Establishments (SIC-99)	43	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		24
Fishing (NAICS-11411)		6
Finfish fishing (NAICS-114111)		5
shellfish fishing (NAICS-114112)		1
Mining (NAICS-21)		11
Utilities (NAICS-22)		13
Construction (NAICS-23)		869
Manufacturing (NAICS-31)		347
Wholesale trade (NAICS-42)		250
Retail trade (NAICS-44)		1,135
Transportation & warehousing (NAICS-48)		119
Information (NAICS-51)		131
Finance & insurance (NAICS-52)		308
Real estate & rental & leasing (NAICS-53)		343
Professional, scientific & technical services (NAICS-54)		645
Management of companies & enterprises (NAICS-55)		24
Admin, support, waste mgt, remediation services (NAICS-56)		312
Educational services (NAICS-61)		64
Health care and social assistance (NAICS-62)		692
Arts, entertainment & recreation (NAICS-71)		85
Accommodation & food services (NAICS-72)		682
Other services (except public administration) (NAICS-81)		546
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		6
Unclassified establishments (NAICS-99)		130

San Luis Obispo County California HMS Communities Demographic Profiles

Major HMS Ports	Morro Bay, San Luis Obispo Co.	
	1990	2000
Population (numbers)	9,664	10,350
<i>Gender (Percent total population)</i>		
Male	48.0%	47.7%
Female	52.0%	52.3%
<i>Race and Hispanic origin (Percent total population)</i>		
White	93.7%	89.4%
Black	0.6%	0.7%
Native American	1.1%	0.9%
Asian or Pacific Islander	1.7%	1.9%
Other Race	2.9%	4.1%
Hispanic Origin (any race)	7.7%	11.4%
<i>Age Structure (Percent total population)</i>		
Under 5 years	4.6%	3.7%
5-9 Years	4.3%	4.3%
10-14 Years	4.0%	4.6%
15-19 Years	4.5%	4.9%
20-24 Years	6.8%	6.1%
25-34 Years	15.1%	11.8%
35-44 Years	14.7%	13.6%
45-54 Years	9.2%	15.9%
55-59 Years	4.6%	5.5%
60-64 Years	6.3%	5.4%
65-74 Years	14.3%	11.3%
75-84 Years	8.5%	9.5%
85 Years and greater	3.1%	3.4%
Median Age (Years)	NA	45.7
18 Years and greater	84.8%	84.9%
Male	40.2%	40.2%
Female	44.7%	44.7%
21 Years and greater	81.3%	81.3%
62 Years and greater	29.9%	27.5%
65 Years and greater	25.9%	24.2%
Male	10.8%	9.9%
Female	15.1%	14.3%
Educational Attainment (Persons 25 years and over)		
Graduate or professional degree	5.3%	NA
Bachelor's degree	11.2%	NA
Associate's degree	7.9%	NA
Some college no degree	20.4%	NA
High school graduate	19.1%	NA
9th to 12th no diploma	9.3%	NA
Less than 9th grade	3.4%	NA
Economic Activity (Percent total population)		
<i>Labor Force by Gender (Persons 16 years and over)</i>		
Males	48.7%	NA
Females	25.7%	NA
	23.0%	NA

Source: U.S. Bureau of Census

A.4.3.14 HMS Community Profile: Santa Barbara Area, CA (Santa Barbara County, Ventura County, Oxnard

and Pt. Hueneme)

Santa Barbara County

Agriculture is an important contributor to the Santa Barbara County economy. In 1997, it accounted for 11% of the County's total income. In 1999, manufacturing was the leading sector of the County's economy in terms of non-agricultural income, followed by health care and social assistance, retail trade, professional, scientific and technical services, and construction.

Ventura County

Agriculture is an important component of the Ventura County economy. In 1997, agriculture accounted for 9% of the County's total labor and proprietor income. In 1999, manufacturing accounted for the largest share of Ventura County's non-agricultural income, followed by the retail trade, wholesale trade, health care and social assistance, and finance and insurance sectors.

Oxnard <http://www.ci.oxnard.ca.us/>

The earliest inhabitants of the Oxnard areas were the Chumash Indians. During the mid nineteenth century, immigrants began to pour in from the east coast and Europe. The major industry, agriculture, produced great crops of barley and lima beans. In 1897, ranchers Albert Maulhardt and Johannes Borchard believed sugar beets would be a profitable crop for the area, and invited Henry Oxnard to construct a local factory to process the harvests. Oxnard and his three brothers operated the American Beet Sugar factory in Chino, California and encouraged by a pledge of 18,000 acres of sugar beets from local farmers, built a factory in the heart of the rich fields. The Southern Pacific Railroad constructed a spur right to the factory site so the processed beets could be shipped out.

A town quickly sprang up near the factory. Almost overnight businesses and residences appeared around the town square, and schools and churches emerged almost as rapidly. The City of Oxnard was incorporated in 1903, taking its name from the Oxnard brothers who had founded the sugar beet factory.

The factory attracted many Chinese, Japanese and Mexican workers to Oxnard and the sugar beet industry brought diversification to agriculture. Major crops then included beans, beets, and barley.

Oxnard is surrounded by some of the richest agricultural land in the world, and agriculture has remained the major industry. The establishment of military bases at Port Hueneme and Point Mugu during World War II, and the rise of electronic, aerospace, and other manufacturing industries have contributed to the growth of the city and surrounding areas.

Port Hueneme <http://www.portofhueneme.org/>

The Port of Hueneme began sixty years ago with a mission to provide California's Central Coast agricultural community with an ocean link to global markets. Located approximately sixty miles northwest of Los Angeles in Ventura County, it became known as "the Port the Farmers Built."

In 1978 Del Monte Fresh Produce began a weekly service to the Port of Hueneme for its import of bananas and tropical fruit. This signaled the first major agricultural import interest to establish business at the Port of Hueneme and Del Monte Fresh Produce remains today as the longest-term international customer of the Port.

The Port of Hueneme is the only deep water harbor between Los Angeles and the San Francisco Bay area and is the U.S. Port of Entry for California's Central Coast region. It serves international businesses and ocean carriers from both the Pacific Rim and Europe. The Port of Hueneme ranks among the top seaports in California for general cargo throughput. The niche markets that Hueneme serves include: the import and export of automobiles, heavy agricultural equipment and industrial vehicles, fresh fruit, fresh produce, forest products, and project cargo. The Port of Hueneme is the top seaport in the United States for citrus export and ranks among the top ten ports in the country for automobile and banana imports. It is home to the largest

dockside refrigeration storage facility on the West Coast. In addition, the Port provides space for local sport and commercial fishing industries.

Its unique positioning near the Santa Barbara Channel has also made Port Hueneme the primary support facility for the offshore oil industry in California's Central Coast area. The Oxnard Harbor District, which is the port authority for Port Hueneme, is also the Grantee for the U.S. Foreign-Trade Zone #205, a trade enhancing program that is available to support global businesses operating in the Central Coast region.

In all, over \$4 billion in cargo value moves through Port Hueneme each year. Top trading partners include Brazil, Costa Rica, Ecuador, Germany and Japan. Port related activities generate over \$388 million for the local economy each year. Additionally 3,500 jobs in Ventura County are directly or indirectly related to Port Hueneme's operations.

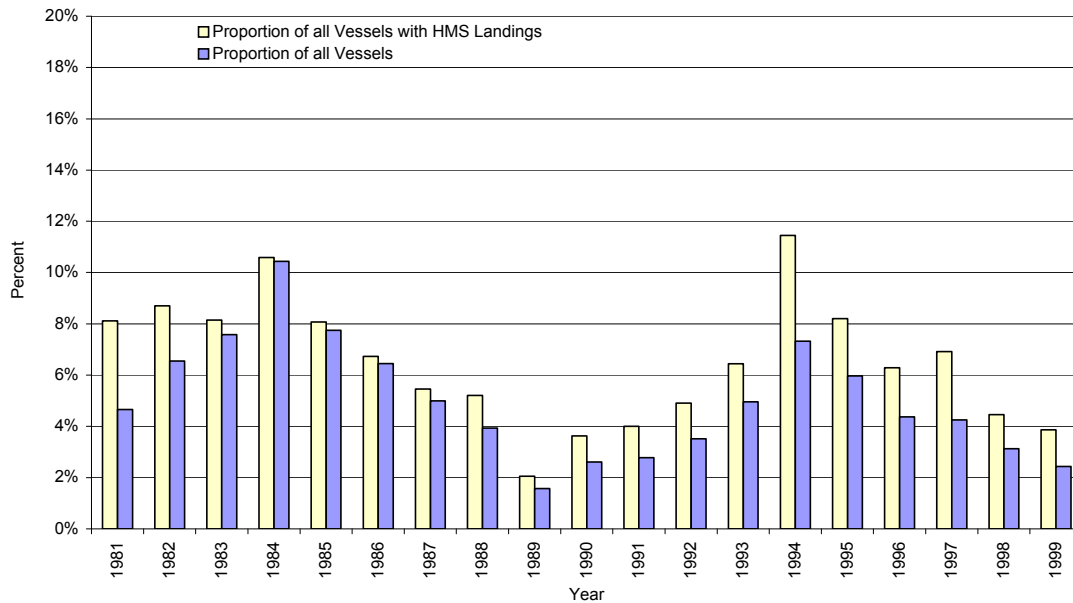
Number of vessels with HMS landings, for which the Santa Barbara area, CA is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	4	0	0	4	17	0	61
1982	2	0	0	7	32	0	68
1983	3	0	0	3	30	1	66
1984	5	0	0	6	33	1	76
1985	2	0	0	1	30	0	68
1986	1	1	0	1	27	0	71
1987	0	0	0	6	18	0	71
1988	0	0	0	7	9	2	64
1989	0	0	0	4	4	0	62
1990	1	0	0	3	10	0	66
1991	1	0	0	5	9	0	54
1992	1	0	0	6	11	0	51
1993	1	0	0	7	17	0	47
1994	0	0	0	10	31	0	40
1995	1	0	0	5	26	0	35
1996	0	0	1	9	11	0	47
1997	4	0	0	4	11	1	55
1998	2	2	0	1	8	0	38
1999	4	0	0	4	3	0	49

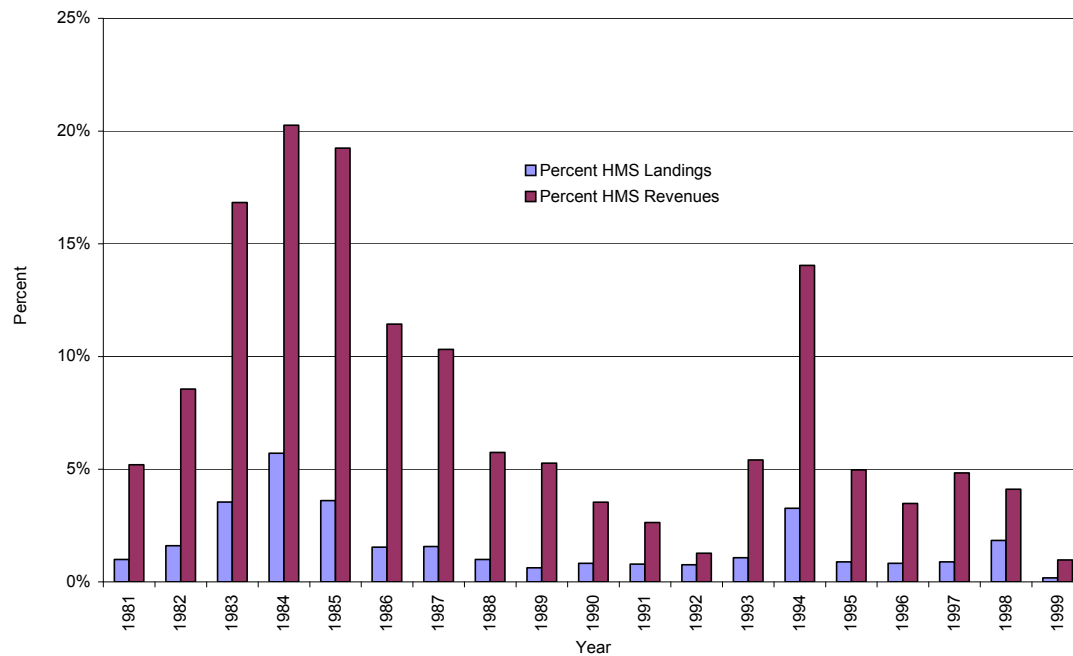
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Santa Barbara area, CA, 1981-99.

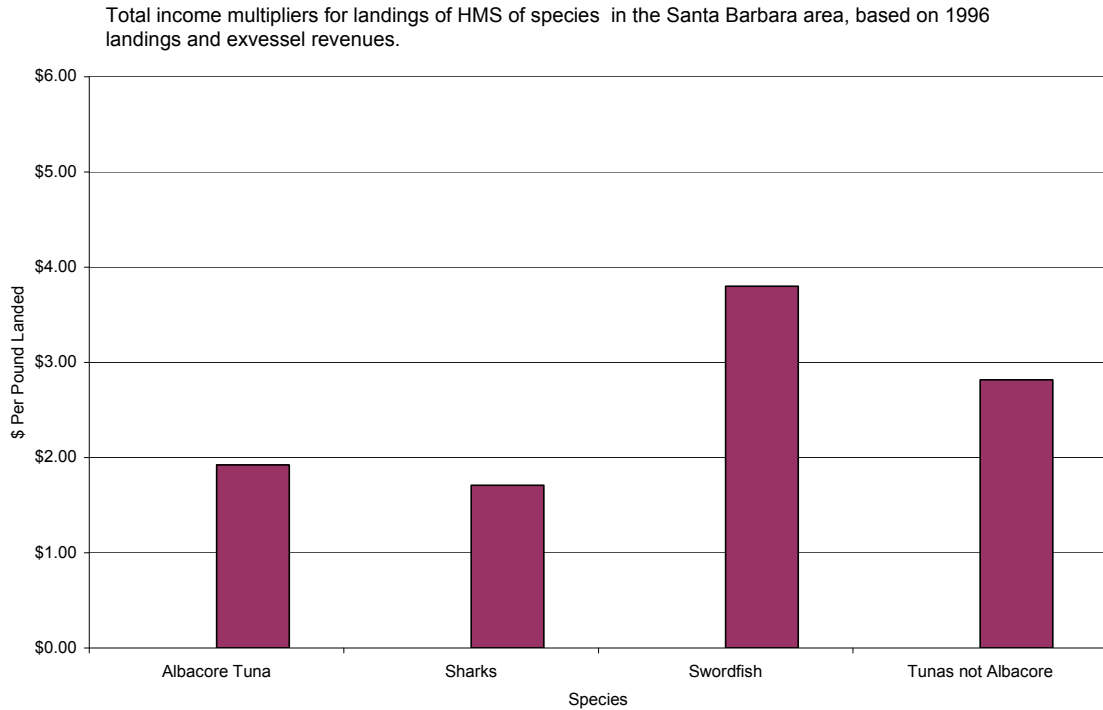
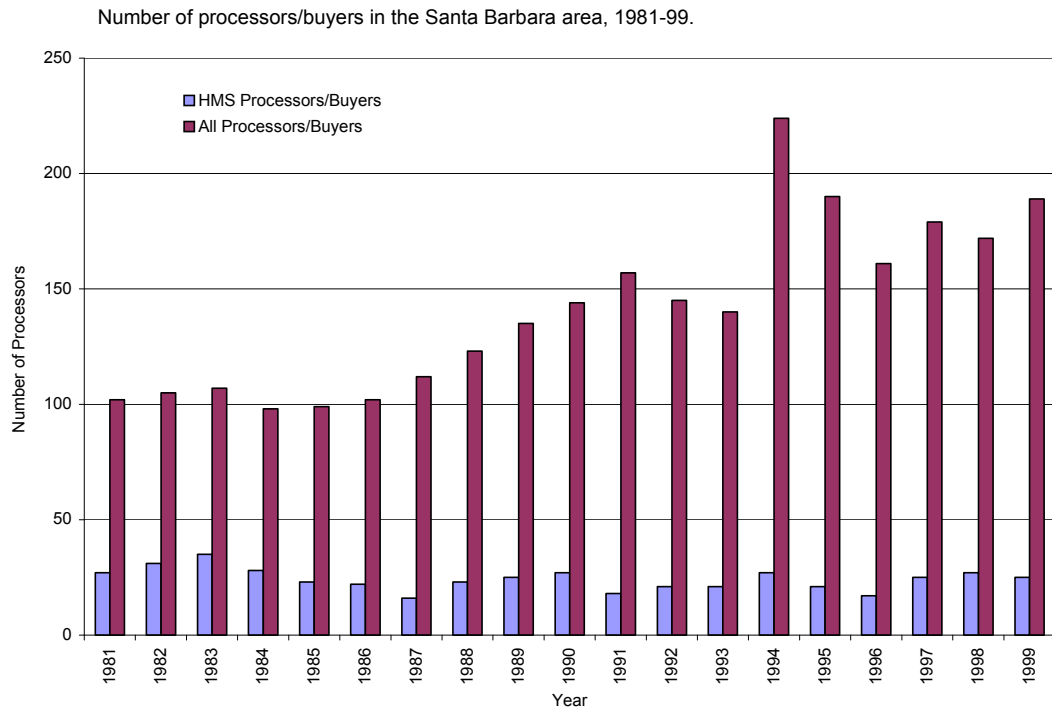
Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	308	12	5		205	71	9	4348
1982	471	23			227	99		7075
1983	454	94			203	217	14	4174
1984	425	26			177	286	3	3524
1985	409	20			168	378		4636
1986	446	6			129	207		6091
1987	440	2			225	129		4631
1988	346	7			166	94		3722
1989	389	1			90	102		4531
1990	386	8			100	55	1	3941
1991	375	6			161	40		3936
1992	367	3			66	20		3796
1993	388	3	4	16	67	159	30	8599
1994	358	9	6	30	178	690	52	9139
1995	390	7	5	5	70	293	45	7637
1996	334	4	3	9	131	245	44	8714
1997	289	14	2		73	268	38	2682
1998	292	17			47	80	11	2082
1999	285	21	2		48	39		7863
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	308	\$40,483	\$10,956		\$331,554	\$610,617	\$20,065	\$7,075,768
1982	471	\$78,700			\$407,337	\$807,733	\$2,123	\$6,904,383
1983	454	\$199,370	\$1,029		\$357,340	\$1,403,916	\$39,503	\$5,436,412
1984	425	\$62,298	\$2,524		\$396,416	\$1,807,052	\$9,583	\$5,490,805
1985	409	\$45,894	\$1,521		\$393,468	\$2,248,663	\$2,299	\$6,582,947
1986	446	\$15,095	\$1,137		\$331,023	\$1,601,755	\$3,643	\$8,375,113
1987	440	\$5,442	\$416		\$600,631	\$1,139,261	\$2,864	\$7,704,720
1988	346	\$76,853	\$110		\$445,709	\$754,358	\$1,538	\$6,317,859
1989	389	\$2,859	\$984		\$236,772	\$879,516	\$682	\$8,639,658
1990	386	\$29,299	\$1,815	\$38	\$218,694	\$473,062	\$2,671	\$8,608,706
1991	375	\$22,471	\$4,273		\$336,231	\$314,316	\$1,824	\$10,243,827
1992	367	\$12,126	\$1,176		\$134,723	\$142,993	\$710	\$10,149,200
1993	388	\$6,161	\$46,934	\$43,556	\$125,641	\$971,065	\$268,267	\$10,521,185
1994	358	\$9,890	\$52,673	\$56,793	\$332,917	\$3,622,926	\$359,517	\$9,397,491
1995	390	\$15,242	\$31,305	\$5,192	\$120,769	\$1,291,638	\$205,512	\$8,742,373
1996	334	\$5,428	\$27,502	\$8,823	\$254,089	\$859,917	\$168,453	\$8,862,548
1997	289	\$29,006	\$6,929	\$520	\$137,568	\$899,548	\$136,894	\$7,083,213
1998	292	\$33,967	\$4,121	\$528	\$89,264	\$309,577	\$48,172	\$6,247,670
1999	285	\$59,143	\$7,852	\$362	\$80,920	\$183,549	\$1,328	\$9,374,583

Proportion of vessels whose principal species is a HMS & whose principal port is Santa Barbara area, CA of all vessels making HMS landings, & the proportion of these vessels of the total number of vessels making landings in the Santa Barbara area, 1981-99.



Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Santa Barbara area, CA, 1981-99





Santa Barbara Area California HMS Communities Demographic Profiles

	County			
	Santa Barbara		Ventura	
	1990	2000	1990	2000
Population (numbers)	369,608	399,347	669,016	753,197
<i>Gender (Percent total population)</i>				
Male	50.2%	50.0%	50.4%	49.9%
Female	49.8%	50.0%	49.6%	50.1%
<i>Race and Hispanic origin (Percent total population)</i>				
White	77.2%	72.7%	79.1%	69.9%
Black	2.8%	2.3%	2.3%	1.9%
Native American	0.9%	1.2%	0.7%	0.9%
Asian or Pacific Islander	4.4%	4.3%	5.2%	5.6%
Other Race	14.6%	15.2%	12.7%	17.7%
Hispanic Origin (any race)	26.6%	34.2%	26.4%	33.4%
<i>Age Structure (Percent total population)</i>				
Under 5 years	7.3%	6.5%	8.0%	7.5%
5-9 Years	6.8%	7.4%	7.8%	8.4%
10-14 Years	5.8%	7.0%	7.2%	8.0%
15-19 Years	7.5%	8.0%	7.4%	7.4%
20-24 Years	10.5%	9.3%	7.6%	6.2%
25-34 Years	18.2%	13.9%	18.1%	13.8%
35-44 Years	14.5%	15.1%	16.4%	16.9%
45-54 Years	9.3%	12.3%	10.7%	13.6%
55-59 Years	3.9%	4.3%	3.9%	4.6%
60-64 Years	3.9%	3.5%	3.4%	3.4%
65-74 Years	6.9%	6.3%	5.5%	5.3%
75-84 Years	4.0%	4.6%	3.0%	3.6%
85 Years and greater	1.4%	1.7%	0.9%	1.2%
Median Age (years)	NA	33.4	NA	34.2
18 Years and greater	76.8%	75.1%	72.6%	71.6%
Male	38.3%	37.2%	36.4%	35.3%
Female	38.5%	37.9%	36.2%	36.2%
21 Years and greater	70.2%	68.7%	67.9%	67.4%
62 Years and greater	14.7%	14.8%	11.4%	12.2%
65 Years and greater	12.3%	12.7%	9.4%	10.2%
Male	5.1%	5.4%	3.9%	4.3%
Female	7.3%	7.3%	5.5%	5.9%
<i>Educational Attainment (Persons 25 years and over)</i>				
Graduate or professional degree	6.3%	NA	4.9%	NA
Bachelor's degree	10.4%	NA	9.4%	NA
Associate's degree	5.2%	NA	5.4%	NA
Some college no degree	15.0%	NA	15.9%	NA
High school graduate	13.2%	NA	13.7%	NA
9th to 12th no diploma	6.5%	NA	6.7%	NA
Less than 9th grade	6.0%	NA	6.1%	NA
Economic Activity				
<i>Labor Force by Gender (Persons 16 years and over)</i>				
Males	52.6%	NA	53.7%	NA
Females	23.1%	NA	22.9%	NA

Santa Barbara Area California HMS Communities Demographic Profiles

	County			
	Santa Barbara		Ventura	
	1993	1999	1993	1999
Economic Activity (cont'd)				
<i>Employment (numbers)</i>				
Agricultural Services, Forestry, and Fishing (SIC-07)	689		355	
Fishing, hunting and trapping (SIC-0900)	0-19		3,444	
Mining (SIC-10)	121		1,327	
Construction (SIC-15)	3,498		10,507	
Manufacturing (SIC-20)	14,235		33,026	
Transportation and Public Utilities (SIC-40)	2,250		10,495	
Wholesale Trade (SIC-50)	4,376		12,023	
Retail Trade (SIC-52)	18,476		44,581	
Finance, Insurance, and Real Estate (SIC-60)	3,701		11,253	
Services (SIC-70)	24,760		64,752	
Unclassified Establishments (SIC-99)	41		72	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		554		1,164
Fishing (NAICS-11411)		4		20-99
Finfish fishing (NAICS-114111)		0-19		0-19
shellfish fishing (NAICS-114112)		0-19		41
Mining (NAICS-21)		964		558
Utilities (NAICS-22)		257		532
Construction (NAICS-23)		8,273		16,557
Manufacturing (NAICS-31)		16,464		30,860
Wholesale trade (NAICS-42)		4,678		15,413
Retail trade (NAICS-44)		20,154		32,059
Transportation & warehousing (NAICS-48)		2,218		3,589
Information (NAICS-51)		5,189		7,384
Finance & insurance (NAICS-52)		6,191		13,898
Real estate & rental & leasing (NAICS-53)		3,067		3,509
Professional, scientific & technical services (NAICS-54)		7,929		12,973
Management of companies & enterprises (NAICS-55)		2,274		3,100
Admin, support, waste mgt, remediation services (NAICS-56)		9,148		20,084
Educational services (NAICS-61)		3,106		3,376
Health care and social assistance (NAICS-62)		16,737		22,778
Arts, entertainment & recreation (NAICS-71)		2,841		3,591
Accommodation & food services (NAICS-72)		18,340		21,312
Other services (except public administration) (NAICS-81)		6,411		11,069
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		501		633
Unclassified establishments (NAICS-99)		219		378
<i>Labor and Proprietor Income (\$1,000)</i>				
Agricultural Services, Forestry, and Fishing (SIC-07)	11,519		54,413	
Fishing, hunting and trapping (SIC-0900)	0		0	
Mining (SIC-10)	5,561		50,121	
Construction (SIC-15)	85,082		269,639	
Manufacturing (SIC-20)	483,578		1,110,388	
Transportation and Public Utilities (SIC-40)	62,786		355,862	
Wholesale Trade (SIC-50)	122,675		396,306	
Retail Trade (SIC-52)	250,868		630,919	
Finance, Insurance, and Real Estate (SIC-60)	93,155		294,344	
Services (SIC-70)	638,954		1,471,403	
Unclassified Establishments (SIC-99)	786		1,125	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		26,816		28,124
Fishing (NAICS-11411)		15		0
Finfish fishing (NAICS-114111)		0		0
shellfish fishing (NAICS-114112)		0		546
Mining (NAICS-21)		44,793		27,622
Utilities (NAICS-22)		17,534		29,077
Construction (NAICS-23)		282,910		506,593
Manufacturing (NAICS-31)		679,229		1,229,030
Wholesale trade (NAICS-42)		209,700		737,555
Retail trade (NAICS-44)		435,202		740,914
Transportation & warehousing (NAICS-48)		55,317		97,592
Information (NAICS-51)		248,914		339,910
Finance & insurance (NAICS-52)		276,468		655,384
Real estate & rental & leasing (NAICS-53)		80,201		98,058
Professional, scientific & technical services (NAICS-54)		378,325		565,858
Management of companies & enterprises (NAICS-55)		125,009		243,105
Admin, support, waste mgt, remediation services (NAICS-56)		192,044		406,840

Santa Barbara Area California HMS Communities Demographic Profiles

	County			
	Santa Barbara		Ventura	
	1993	1999	1993	1999
Economic Activity (cont'd)				
<i>Labor and Proprietor Income (\$1,000) (cont'd)</i>				
Educational services (NAICS-61)		66,749		68,712
Health care and social assistance (NAICS-62)		491,620		687,678
Arts, entertainment & recreation (NAICS-71)		71,088		71,177
Accommodation & food services (NAICS-72)		234,927		245,696
Other services (except public administration) (NAICS-81)		117,862		211,750
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		29,389		42,822
Unclassified establishments (NAICS-99)		4,989		10,415
<i>Number of Establishments</i>				
Agricultural Services, Forestry, and Fishing (SIC-07)	156		355	
Fishing, hunting and trapping (SIC-0900)	1		5	
Mining (SIC-10)	7		64	
Construction (SIC-15)	788		1,480	
Manufacturing (SIC-20)	409		975	
Transportation and Public Utilities (SIC-40)	176		548	
Wholesale Trade (SIC-50)	377		1,138	
Retail Trade (SIC-52)	1,528		3,314	
Finance, Insurance, and Real Estate (SIC-60)	559		1,369	
Services (SIC-70)	2,433		5,736	
Unclassified Establishments (SIC-99)	59		88	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		52		72
Fishing (NAICS-11411)		5		7
Finfish fishing (NAICS-114111)		3		3
shellfish fishing (NAICS-114112)		2		4
Mining (NAICS-21)		36		45
Utilities (NAICS-22)		13		41
Construction (NAICS-23)		1,036		1,760
Manufacturing (NAICS-31)		506		1,023
Wholesale trade (NAICS-42)		480		1,094
Retail trade (NAICS-44)		1,625		2,350
Transportation & warehousing (NAICS-48)		184		316
Information (NAICS-51)		226		326
Finance & insurance (NAICS-52)		555		962
Real estate & rental & leasing (NAICS-53)		583		709
Professional, scientific & technical services (NAICS-54)		1,154		1,908
Management of companies & enterprises (NAICS-55)		66		80
Admin, support, waste mgt, remediation services (NAICS-56)		568		950
Educational services (NAICS-61)		144		177
Health care and social assistance (NAICS-62)		1,160		1,862
Arts, entertainment & recreation (NAICS-71)		206		257
Accommodation & food services (NAICS-72)		968		1,203
Other services (except public administration) (NAICS-81)		935		1,378
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		23		19
Unclassified establishments (NAICS-99)		155		258

Santa Barbara Area California HMS Communities Demographic Profiles

Major HMS Ports	Santa Barbara, Santa Barbara Co.		Oxnard, Ventura Co.		Pt. Hueneme, Ventura Co.	
	1990	2000	1990	2000	1990	2000
Population (numbers)	85,571	92,325	142,216	170,358	20,319	21,845
<i>Gender (Percent total population)</i>						
Male	49.0%	49.2%	51.1%	51.1%	52.5%	50.3%
Female	51.0%	50.8%	48.9%	48.9%	47.5%	49.7%
<i>Race and Hispanic origin (Percent total population)</i>						
White	77.7%	74.0%	58.7%	42.1%	73.5%	57.3%
Black	2.2%	1.8%	5.2%	3.8%	5.5%	6.1%
Native American	0.9%	1.1%	0.8%	1.3%	1.0%	1.7%
Asian or Pacific Islander	2.3%	2.9%	8.6%	8.0%	6.8%	6.8%
Other Race	16.8%	16.4%	26.7%	40.4%	13.1%	21.8%
Hispanic Origin (any race)	31.5%	35.0%	54.4%	66.2%	29.8%	41.0%
<i>Age Structure (Percent total population)</i>						
Under 5 years	6.2%	5.6%	9.3%	8.9%	9.0%	8.8%
5-9 Years	5.2%	6.0%	8.8%	9.5%	8.5%	8.3%
10-14 Years	4.3%	5.2%	7.9%	8.4%	6.7%	6.9%
15-19 Years	5.4%	7.2%	8.2%	8.3%	7.0%	7.1%
20-24 Years	10.3%	9.5%	9.2%	8.5%	10.0%	9.7%
25-34 Years	20.6%	17.1%	19.1%	16.2%	21.9%	16.8%
35-44 Years	16.0%	15.2%	13.9%	14.7%	13.3%	15.2%
45-54 Years	8.5%	13.1%	8.7%	10.8%	7.2%	9.9%
55-59 Years	3.4%	4.2%	3.8%	3.6%	3.1%	3.5%
60-64 Years	3.8%	3.1%	3.4%	2.9%	3.3%	3.1%
65-74 Years	7.5%	5.8%	5.0%	4.7%	5.8%	5.6%
75-84 Years	6.0%	5.3%	2.2%	2.7%	3.2%	4.0%
85 Years and greater	2.7%	2.7%	0.6%	0.7%	0.9%	1.1%
Median Age (Years)	NA	34.6	NA	28.9	NA	30.3
18 Years and greater	81.7%	80.2%	69.3%	68.2%	72.5%	72.4%
Male	39.6%	39.1%	35.5%	34.8%	38.3%	36.3%
Female	42.1%	41.1%	33.8%	33.4%	34.2%	36.1%
21 Years and greater	76.9%	73.8%	64.0%	63.2%	66.8%	66.8%
62 Years and greater	18.5%	15.6%	9.7%	9.8%	12.0%	12.4%
65 Years and greater	16.2%	13.8%	7.7%	8.1%	9.9%	10.7%
Male	5.9%	5.4%	3.3%	3.6%	3.8%	4.3%
Female	10.3%	8.4%	4.4%	4.6%	6.1%	6.4%
						0.0%
Educational Attainment (Persons 25 years and over)						0.0%
Graduate or professional degree	8.8%	NA	2.3%	NA	3.1%	NA
Bachelor's degree	14.1%	NA	5.1%	NA	6.2%	NA
Associate's degree	5.0%	NA	4.0%	NA	4.9%	NA
Some college no degree	15.6%	NA	11.7%	NA	16.2%	NA
High school graduate	11.3%	NA	11.8%	NA	15.6%	NA
9th to 12th no diploma	7.5%	NA	8.5%	NA	6.9%	NA
Less than 9th grade	7.0%	NA	13.4%	NA	5.4%	NA
Economic Activity (Percent total population)						
<i>Labor Force by Gender (Persons 16 years and over)</i>						
Males	57.3%	NA	51.5%	NA	53.8%	NA
Females	31.8%	NA	30.0%	NA	32.8%	NA
	25.5%	NA	21.6%	NA	21.0%	NA

Source: U.S. Bureau of Census

A.4.3.15 HMS Community Profile: Los Angeles County, CA (San Pedro, Terminal Is. and Long Beach)

Los Angeles County

Los Angeles County has a relatively diverse economy. Agriculture accounted for less than one percent of total income in 1997. Manufacturing contributed the greatest share to the County's non-agricultural income in 1999, followed by health care and social assistance, finance and insurance, whole sale trade and information.

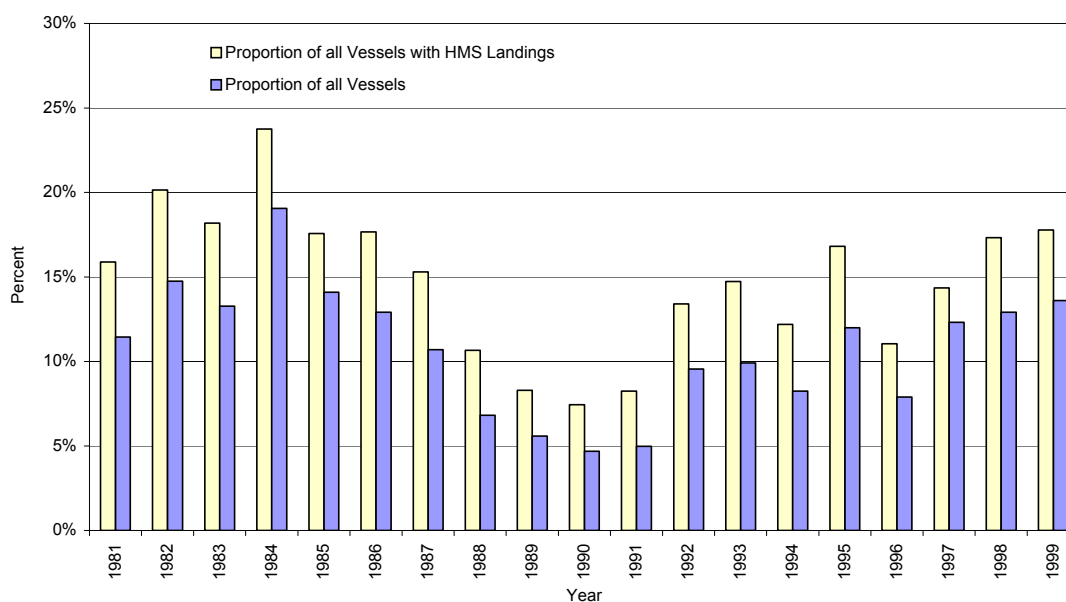
Number of vessels with HMS landings, for which San Pedro, CA is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	18	0		7	35	1	67
1982	8	2		11	61	0	64
1983	7	2		1	51	1	32
1984	11	1		1	68	0	56
1985	6	3		5	41	0	48
1986	3	2		6	39	0	39
1987	6	2		4	29	2	48
1988	2	1		3	20	1	45
1989	1	0		1	16	1	33
1990	0	1		2	12	1	28
1991	5	0		4	6	1	20
1992	10	1		3	11	1	35
1993	10	0		8	12	3	35
1994	0	0		2	21	2	27
1995	6	2		3	19	6	31
1996	1	1		0	13	5	33
1997	8	0		3	20	2	41
1998	10	1		1	19	0	36
1999	11	0		0	21	0	29

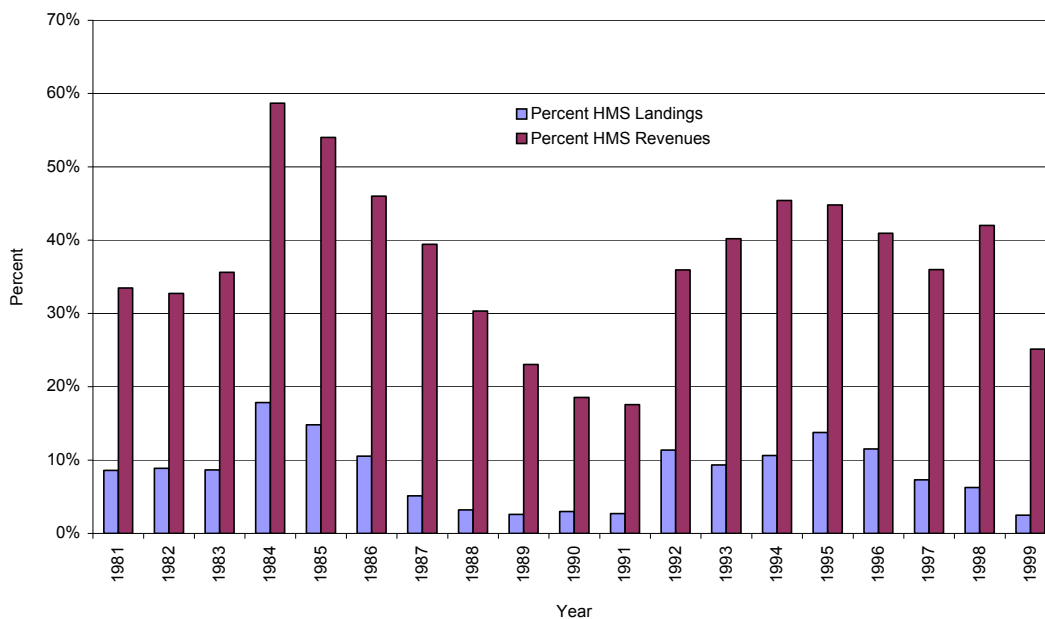
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, San Pedro, CA, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	384	144	107		639	244	615	16538
1982	407	94	148		859	429	107	14460
1983	341	56	228		365	539	160	12054
1984	341	166	336		415	1123	359	10147
1985	313	208	784		310	883	226	13543
1986	283	177	1179		172	543	250	18389
1987	281	26	539		119	278	325	21837
1988	253	63	349		115	267	130	24572
1989	229	4	237		106	158	199	25013
1990	215	21	426		57	114	144	23063
1991	194	176	100		61	95	278	23416
1992	194	366	830	2	87	97	1144	18333
1993	224	500	485		155	165	1789	27330
1994	205	52	729	10	116	170	2231	25690
1995	214	318	687		62	98	7313	49829
1996	181	34	2329		99	189	3162	40200
1997	230	441	893	2	71	471	1908	44959
1998	179	535	1175		85	279	498	37659
1999	180	408	10	7	110	559	350	49061
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	384	\$521,930	\$434,509	\$25	\$1,029,953	\$1,891,539	\$1,846,905	\$9,279,536
1982	407	\$233,756	\$466,037	\$892	\$1,449,187	\$3,202,524	\$366,710	\$8,480,250
1983	341	\$134,942	\$747,229		\$620,926	\$3,318,453	\$538,803	\$6,957,906
1984	341	\$344,562	\$873,611		\$765,809	\$6,564,859	\$928,581	\$5,344,723
1985	313	\$351,521	\$1,324,880	\$120	\$626,649	\$5,084,331	\$491,406	\$6,177,301
1986	283	\$317,757	\$2,892,637		\$404,014	\$3,935,876	\$483,443	\$7,322,992
1987	281	\$60,879	\$2,359,340		\$280,127	\$2,399,096	\$1,370,237	\$7,926,227
1988	253	\$179,018	\$2,092,683		\$297,724	\$2,096,235	\$484,243	\$8,752,359
1989	229	\$11,133	\$574,723		\$226,470	\$1,272,699	\$509,433	\$6,917,145
1990	215	\$57,969	\$811,362	\$21	\$111,965	\$820,905	\$325,186	\$6,460,494
1991	194	\$381,466	\$118,548	\$240	\$111,306	\$676,615	\$735,209	\$7,181,311
1992	194	\$1,079,043	\$982,892	\$4,603	\$157,316	\$640,636	\$1,229,772	\$6,382,095
1993	224	\$1,150,707	\$633,044	\$1,519	\$280,908	\$1,065,088	\$2,865,076	\$6,452,471
1994	205	\$113,709	\$1,448,275	\$19,791	\$209,031	\$1,140,323	\$2,061,457	\$5,096,364
1995	214	\$622,339	\$1,011,673	\$547	\$108,320	\$715,087	\$6,153,052	\$9,260,847
1996	181	\$45,239	\$2,092,217	\$802	\$186,672	\$1,079,931	\$2,811,341	\$7,791,326
1997	230	\$796,911	\$1,228,263	\$3,207	\$137,126	\$1,720,144	\$1,853,753	\$9,783,121
1998	179	\$664,096	\$1,699,546	\$337	\$141,466	\$1,099,386	\$692,053	\$5,643,640
1999	180	\$682,261	\$95,402	\$22,849	\$204,788	\$2,248,648	\$708,912	\$9,652,978

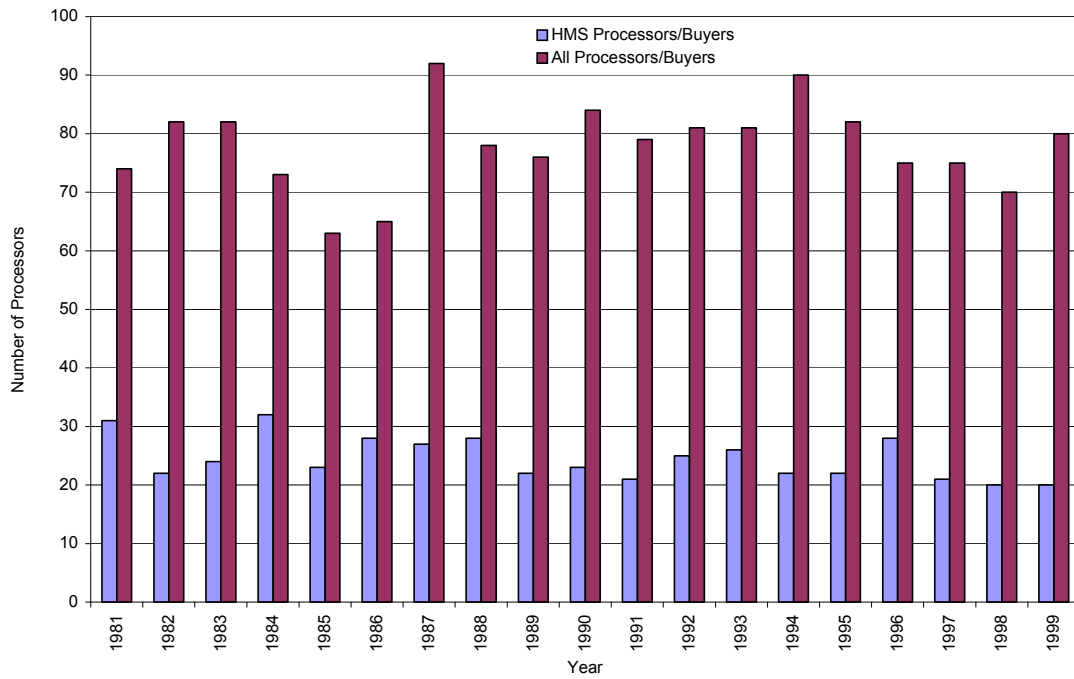
Proportion of vessels whose principal species is a HMS and whose principal port is San Pedro, CA of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in San Pedro, 1981-99.



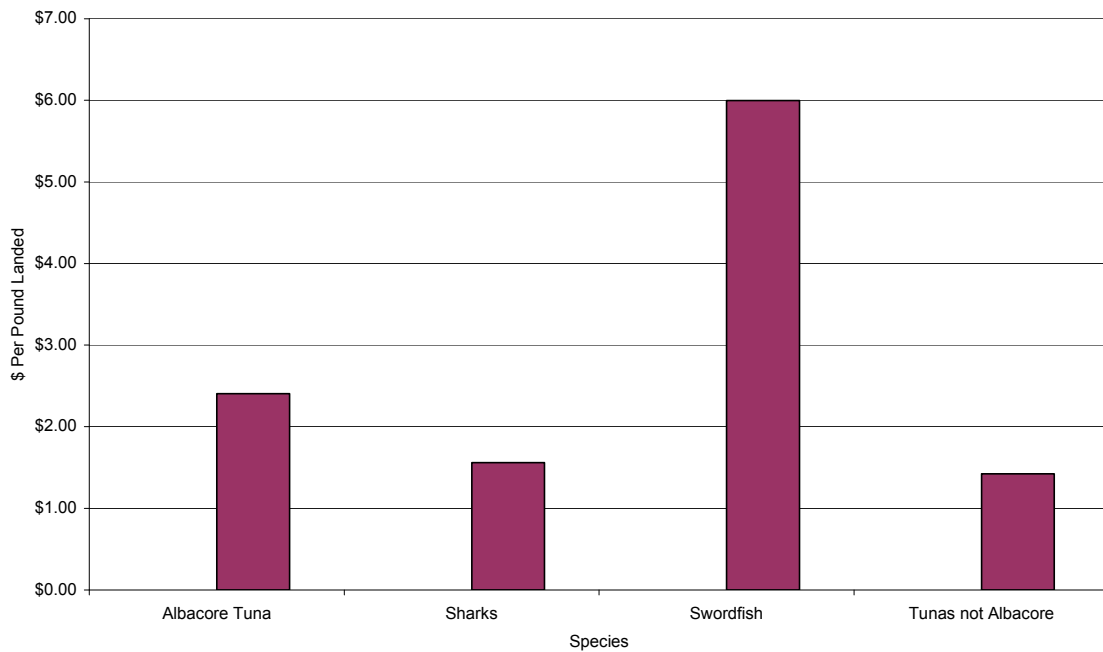
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in San Pedro, CA, 1981-99



Number of processors/buyers in San Pedro CA, 1981-99.



Total income multipliers for landings of HMS of species in the port of San Pedro, CA, based on 1996 landings and exvessel revenues.



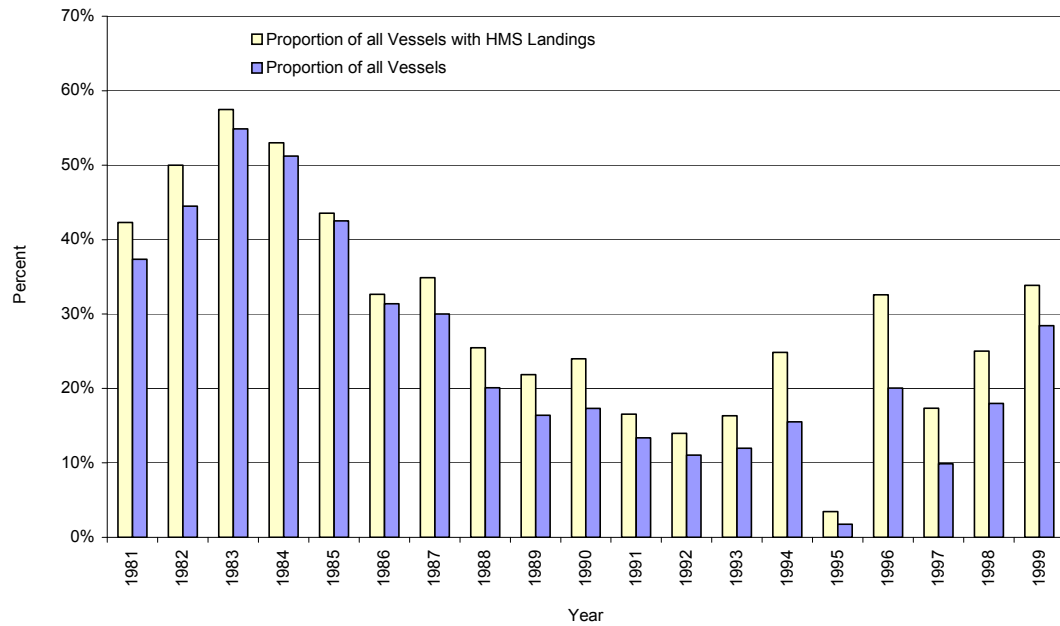
Number of vessels with HMS landings, for which Terminal Island, CA is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	47	0		7	10	54	37
1982	88	1		0	0	57	24
1983	81	0		0	4	61	26
1984	163	0		1	10	37	37
1985	81	2		0	3	22	21
1986	28	3		0	1	16	14
1987	15	0		1	3	26	8
1988	4	1		3	7	26	30
1989	10	1		3	8	18	26
1990	8	2		6	6	13	20
1991	4	0		4	5	10	18
1992	5	0		1	6	7	19
1993	7	0		0	2	8	11
1994	23	0		1	6	8	8
1995	0	0		1	3	0	4
1996	47	2		1	4	5	7
1997	8	1		3	2	7	9
1998	18	1		0	5	14	17
1999	64	1		0	19	5	15

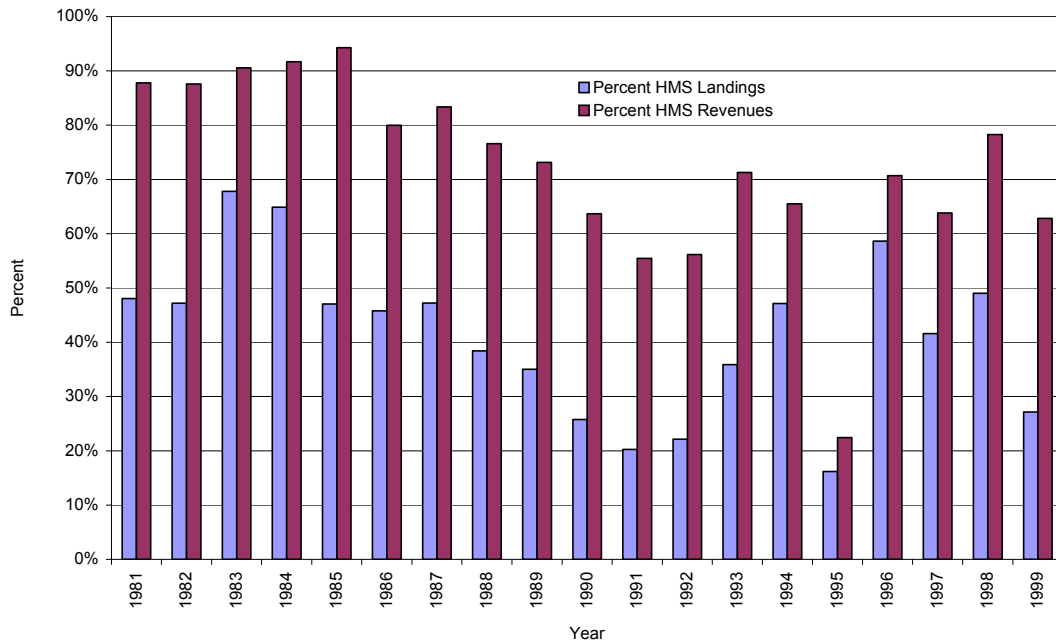
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, Terminal Island, CA, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	279	798	629		340	47	67886	74032
1982	292	2069	2132				57324	67525
1983	254	2359	504		2	23	64520	30956
1984	398	8439	287		30	47	50589	31397
1985	248	2904	2410		11	13	18201	26143
1986	147	1137	3536		7	8	22512	31881
1987	129	346	222		19	62	27308	30565
1988	161	397	446		90	93	26537	43439
1989	183	292	773		119	62	21986	41580
1990	146	405	460		83	48	10655	33014
1991	139	131			84	49	7315	29556
1992	136	281	217		16	23	4495	17440
1993	104	241	38			16	6539	12136
1994	153	2037	147		15	36	4317	6525
1995	116	4	4		9	8	2373	10488
1996	181	4119	2316		10	8	5592	6723
1997	121	25	1302		15	18	8682	13175
1998	152	1311	696		14	24	10050	12614
1999	263	3052	6	4	12	618	4852	21955
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	279	\$2,757,366	\$1,425,867		\$561,366	\$344,575	\$150,629,456	\$21,234,234
1982	292	\$5,034,551	\$3,711,731	\$78	\$218	\$4,444	\$101,393,714	\$15,110,520
1983	254	\$5,059,385	\$865,172		\$4,064	\$136,864	\$99,145,118	\$10,568,973
1984	398	\$18,054,736	\$459,391	\$13	\$57,839	\$299,143	\$77,763,570	\$10,528,780
1985	248	\$5,124,753	\$2,685,582		\$24,964	\$94,198	\$27,018,109	\$7,321,771
1986	147	\$1,967,124	\$3,671,840		\$15,429	\$62,549	\$25,917,090	\$7,846,746
1987	129	\$791,594	\$270,773		\$45,540	\$506,160	\$36,015,618	\$7,395,509
1988	161	\$977,855	\$630,974		\$241,965	\$797,310	\$41,269,832	\$11,045,627
1989	183	\$742,689	\$921,517		\$304,272	\$503,318	\$28,811,988	\$10,370,109
1990	146	\$944,131	\$505,130		\$193,342	\$357,967	\$12,562,091	\$7,527,712
1991	139	\$256,676	\$2,047		\$189,055	\$365,748	\$7,158,033	\$5,768,133
1992	136	\$821,439	\$178,300		\$30,427	\$154,165	\$3,514,932	\$3,066,558
1993	104	\$553,745	\$32,345		\$863	\$103,482	\$6,196,874	\$2,128,505
1994	153	\$4,438,703	\$149,768	\$959	\$26,040	\$245,048	\$4,279,632	\$2,604,497
1995	116	\$9,248	\$5,320		\$13,586	\$58,227	\$2,000,830	\$3,347,053
1996	181	\$9,216,111	\$1,985,066		\$20,928	\$46,747	\$4,817,810	\$2,987,631
1997	121	\$46,799	\$1,380,487	\$83	\$24,918	\$93,502	\$8,690,675	\$3,437,633
1998	152	\$1,679,438	\$827,227		\$23,549	\$110,042	\$9,481,354	\$3,007,404
1999	263	\$5,922,288	\$34,610	\$9,113	\$17,121	\$2,157,528	\$4,025,438	\$5,937,843

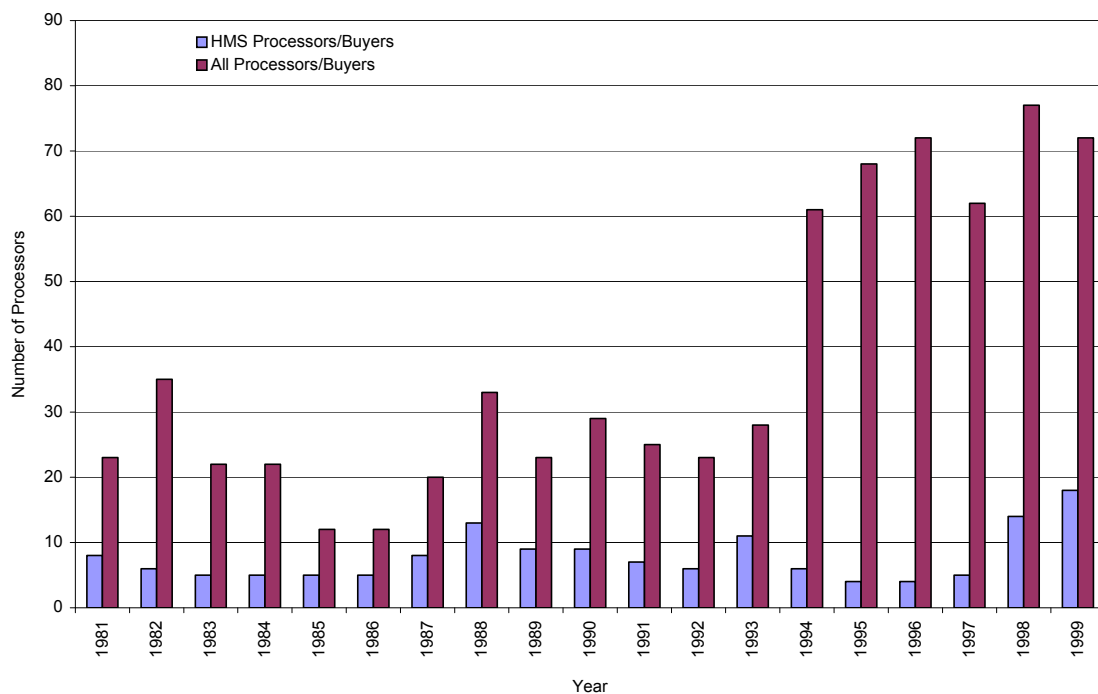
Proportion of vessels whose principal species is a HMS and whose principal port is Terminal Island CA, of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in Terminal Island, 1981-99.



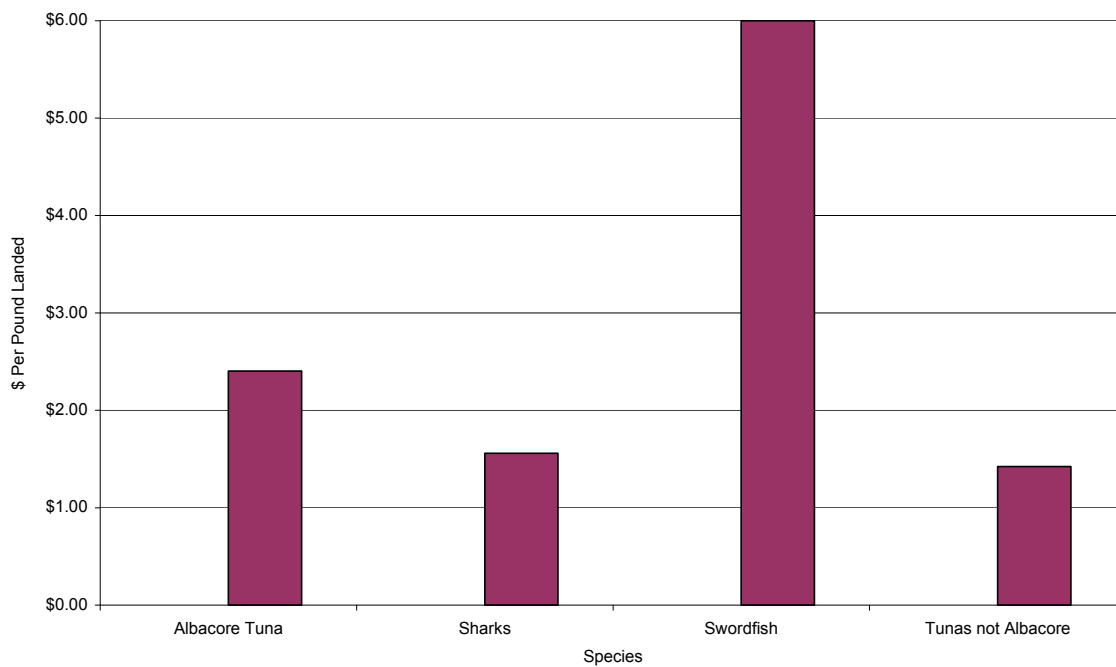
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in Terminal Island, CA, 1981-99



Number of processors/buyers in Terminal Island, CA, 1981-99.



Total income multipliers for landings of HMS of species in the port of Terminal Island, CA, based on 1996 landings and exvessel revenues.



Los Angeles County California HMS Communities Demographic Profiles

	County	
	Los Angeles	
	1990	2000
Population (numbers)	8,863,164	9,519,338
<i>Gender (Percent total population)</i>		
Male	49.9%	49.4%
Female	50.1%	50.6%
<i>Race and Hispanic origin (Percent total population)</i>		
White	56.8%	48.7%
Black	11.2%	9.8%
Native American	0.5%	0.8%
Asian or Pacific Islander	10.8%	12.2%
Other Race	20.7%	23.5%
Hispanic Origin (any race)	37.8%	44.6%
<i>Age Structure (Percent total population)</i>		
Under 5 years	8.3%	7.7%
5-9 Years	7.3%	8.4%
10-14 Years	6.6%	7.6%
15-19 Years	7.2%	7.2%
20-24 Years	9.1%	7.4%
25-34 Years	19.8%	16.6%
35-44 Years	15.1%	15.9%
45-54 Years	9.5%	12.1%
55-59 Years	3.7%	4.1%
60-64 Years	3.6%	3.2%
65-74 Years	5.7%	5.2%
75-84 Years	3.0%	3.4%
85 Years and greater	1.0%	1.1%
Median Age (years)	NA	32.0
18 Years and greater	73.8%	72.0%
Male	36.4%	35.1%
Female	37.3%	36.9%
21 Years and greater	68.8%	67.6%
62 Years and greater	11.8%	11.6%
65 Years and greater	9.7%	9.7%
Male	3.9%	4.0%
Female	5.8%	5.7%
<i>Educational Attainment (Persons 25 years and over)</i>		
Graduate or professional degree	4.9%	NA
Bachelor's degree	9.0%	NA
Associate's degree	4.5%	NA
Some college no degree	12.2%	NA
High school graduate	12.8%	NA
9th to 12th no diploma	8.9%	NA
Less than 9th grade	9.6%	NA
Economic Activity		
<i>Labor Force by Gender (Persons 16 years and over)</i>	51.4%	NA
Males	29.2%	NA
Females	22.2%	NA

Los Angeles County California HMS Communities Demographic Profiles

	County	
	Los Angeles	
	1993	1999
Economic Activity (con'td)		
<i>Employment (numbers)</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	16,066	
Fishing, hunting and trapping (SIC-0900)	250-499	
Mining (SIC-10)	5,123	
Construction (SIC-15)	101,359	
Manufacturing (SIC-20)	690,622	
Transportation and Public Utilities (SIC-40)	200,740	
Wholesale Trade (SIC-50)	282,543	
Retail Trade (SIC-52)	585,600	
Finance, Insurance, and Real Estate (SIC-60)	261,081	
Services (SIC-70)	1,350,118	
Unclassified Establishments (SIC-99)	1,994	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		1,067
Fishing (NAICS-11411)		182
Finfish fishing (NAICS-114111)		100-249
shellfish fishing (NAICS-114112)		0-19
Mining (NAICS-21)		2,505
Utilities (NAICS-22)		8,774
Construction (NAICS-23)		133,103
Manufacturing (NAICS-31)		622,885
Wholesale trade (NAICS-42)		264,354
Retail trade (NAICS-44)		355,417
Transportation & warehousing (NAICS-48)		143,048
Information (NAICS-51)		165,873
Finance & insurance (NAICS-52)		179,710
Real estate & rental & leasing (NAICS-53)		83,203
Professional, scientific & technical services (NAICS-54)		394,384
Management of companies & enterprises (NAICS-55)		81,276
Admin, support, waste mgt, remediation services (NAICS-56)		322,551
Educational services (NAICS-61)		98,345
Health care and social assistance (NAICS-62)		359,599
Arts, entertainment & recreation (NAICS-71)		70,769
Accommodation & food services (NAICS-72)		269,701
Other services (except public administration) (NAICS-81)		165,061
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		21,855
Unclassified establishments (NAICS-99)		4,275
<i>Labor and Proprietor Income (\$1,000)</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	291,207	
Fishing, hunting and trapping (SIC-0900)	0	
Mining (SIC-10)	246,949	
Construction (SIC-15)	2,938,405	
Manufacturing (SIC-20)	22,076,046	
Transportation and Public Utilities (SIC-40)	7,023,070	
Wholesale Trade (SIC-50)	9,622,001	
Retail Trade (SIC-52)	9,082,753	
Finance, Insurance, and Real Estate (SIC-60)	9,805,700	
Services (SIC-70)	38,386,407	
Unclassified Establishments (SIC-99)	41,354	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		26,390
Fishing (NAICS-11411)		5,688
Finfish fishing (NAICS-114111)		0
shellfish fishing (NAICS-114112)		0

Los Angeles County California HMS Communities Demographic Profiles

	County	
	Los Angeles	
	1993	1999
Economic Activity (cont'd)		
<i>Labor and Proprietor Income (\$1,000) (cont'd)</i>		
Mining (NAICS-21)		123,678
Utilities (NAICS-22)		552,791
Construction (NAICS-23)		4,708,522
Manufacturing (NAICS-31)		22,226,682
Wholesale trade (NAICS-42)		10,387,402
Retail trade (NAICS-44)		8,193,505
Transportation & warehousing (NAICS-48)		5,197,841
Information (NAICS-51)		10,354,247
Finance & insurance (NAICS-52)		11,129,196
Real estate & rental & leasing (NAICS-53)		2,834,669
Professional, scientific & technical services (NAICS-54)		15,344,357
Management of companies & enterprises (NAICS-55)		5,969,314
Admin, support, waste mgt, remediation services (NAICS-56)		6,842,381
Educational services (NAICS-61)		2,676,351
Health care and social assistance (NAICS-62)		11,739,595
Arts, entertainment & recreation (NAICS-71)		4,306,204
Accommodation & food services (NAICS-72)		3,637,540
Other services (except public administration) (NAICS-81)		3,480,799
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		1,068,632
Unclassified establishments (NAICS-99)		118,648
<i>Number of Establishments</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	1,769	
Fishing, hunting and trapping (SIC-0900)	30	
Mining (SIC-10)	27	
Construction (SIC-15)	11,659	
Manufacturing (SIC-20)	18,381	
Transportation And Public Utilities (SIC-40)	7,564	
Wholesale Trade (SIC-50)	20,974	
Retail Trade (SIC-52)	42,798	
Finance, Insurance, And Real Estate (SIC-60)	20,792	
Services (SIC-70)	86,395	
Unclassified Establishments (SIC-99)	1,713	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		138
Fishing (NAICS-11411)		26
Finfish fishing (NAICS-114111)		22
shellfish fishing (NAICS-114112)		2
Mining (NAICS-21)		142
Utilities (NAICS-22)		176
Construction (NAICS-23)		12,100
Manufacturing (NAICS-31)		17,753
Wholesale trade (NAICS-42)		21,860
Retail trade (NAICS-44)		27,869
Transportation & warehousing (NAICS-48)		4,867
Information (NAICS-51)		8,076
Finance & insurance (NAICS-52)		10,655
Real estate & rental & leasing (NAICS-53)		11,006
Professional, scientific & technical services (NAICS-54)		24,453
Management of companies & enterprises (NAICS-55)		1,313
Admin, support, waste mgt, remediation services (NAICS-56)		10,649
Educational services (NAICS-61)		2,488
Health care and social assistance (NAICS-62)		22,516
Arts, entertainment & recreation (NAICS-71)		7,749
Accommodation & food services (NAICS-72)		15,839
Other services (except public administration) (NAICS-81)		18,917
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		428
Unclassified establishments (NAICS-99)		3,509

Los Angeles County California HMS Communities Demographic Profiles

Major HMS Ports	San Pedro, Los Angeles Co.		Terminal Island, Los Angeles Co.		Long Beach, Los Angeles Co.	
	1990	2000	1990	2000	1990	2000
Population (numbers)	NA	NA	NA	NA	429,433	461,522
<i>Gender (Percent total population)</i>						
Male					50.5%	49.1%
Female					49.5%	50.9%
<i>Race and Hispanic origin (Percent total population)</i>						
White					58.4%	45.2%
Black					13.7%	14.9%
Native American					0.6%	0.8%
Asian or Pacific Islander					13.6%	13.3%
Other Race					13.7%	20.6%
Hispanic Origin (any race)					23.6%	35.8%
<i>Age Structure (Percent total population)</i>						
Under 5 years					8.8%	8.4%
5-9 Years					7.4%	9.0%
10-14 Years					5.9%	7.7%
15-19 Years					6.4%	7.3%
20-24 Years					10.3%	7.7%
25-34 Years					21.2%	17.2%
35-44 Years					14.7%	15.7%
45-54 Years					8.2%	11.6%
55-59 Years					3.2%	3.7%
60-64 Years					3.2%	2.7%
65-74 Years					6.1%	4.4%
75-84 Years					3.5%	3.4%
85 Years and greater					1.3%	1.2%
Median Age (Years)					NA	30.8
18 Years and greater					74.5%	70.8%
Male					37.4%	34.2%
Female					37.1%	36.6%
21 Years and greater					69.4%	66.1%
62 Years and greater					12.8%	10.6%
65 Years and greater					10.8%	9.1%
Male					4.2%	3.7%
Female					6.6%	5.4%
Educational Attainment (Persons 25 years and over)						
Graduate or professional degree					4.5%	NA
Bachelor's degree					9.8%	NA
Associate's degree					5.1%	NA
Some college no degree					14.1%	NA
High school graduate					13.0%	NA
9th to 12th no diploma					8.0%	NA
Less than 9th grade					7.1%	NA
Economic Activity (Percent total population)						
<i>Labor Force by Gender (Persons 16 years and over)</i>					51.7%	NA
Males					30.1%	NA
Females					21.6%	NA

Source: U.S. Bureau of Census

A.4.3.16 HMS Community Profile: San Diego County, San Diego, CA

San Diego County

San Diego County is a leading producer of some specialized agricultural crops (e.g. avocados). However, because San Diego County's economy is quite diverse, agriculture's share of total County income is relatively small (about two percent in 1977). In 1999, the County's top five non-agricultural sectors in order of descending share of non-agricultural income were manufacturing, professional, scientific and technical services, wholesale trade, health care and social assistance, and retail trade.

San Diego <http://www.sdchamber.org/>

San Diego's gross regional product (GRP) is forecast to reach \$117.3 billion in 2001, an increase of 6.5% over the estimated \$110.2 billion in 2000. Adjusted for inflation, the "real" increase will be 3.5%. County population will reach 3.0 million during 2001, with an addition of 50,000 new residents. Payroll employment is forecast to increase by 35,000 to 1,243,300 total jobs.

San Diego continues to experience a gradual increases in agriculture due to specialization in the production of avocados, and nursery and decorative plants. San Diego county ranks as the 10th largest agriculture producer in the nation. It also has the second largest number of farms. Nursery and flower crops account for 62% of the total production.

Even with cuts in military spending, defense continues to play a major role in the economy. In 1997, San Diego received more than \$9 billion in expenditures from the U.S. Department of Defense (DOD), a rate second only to Los Angeles County in DOD expenditures and obligations. Military installations include Marine Corps Base Camp Joseph H. Pendleton; the Marine Corps Recruit Depot (MCRD); Marine Corps Air Station at Miramar; Naval Air Station North Island; Naval Station San Diego; and Naval Submarine Base, San Diego. These facilities will continue to train recruits and maintain U.S. military ships and planes. Despite cutbacks in defense revenues, the military will once again become an economic stimulant to the region's growth and fortunes. Past downsizings will be more than recouped as the Navy consolidates to San Diego, and operations in other areas are closed and transferred to the Navy's San Diego mega-port headquarters.

The U.S. Space and Warfare Systems Command (SPAWAR) move from Virginia to San Diego will bring 800 to 1,000 jobs and an operating budget of \$4 billion in 1998. The close of the Long Beach Naval Shipyard will transfer millions of dollars in shipbuilding and repair contracts to private San Diego companies. Coronado's North Island NAS will become homeport to three, massive, nuclear-powered aircraft carriers, entailing a substantial upgrading in facilities to accommodate these larger ships.

San Diego is beginning to be seen as an area for emerging technologies, and while aerospace jobs do not have the impact on San Diego like they did in past years, advances and growth in other technology areas, including biomedical, computers and more means there actually is a shortage of highly trained workers needed for high technology jobs. There are more than 100,000 high technology workers in over 500 companies in San Diego. Telecommunications, such as wireless phones, contributes more than \$5 billion to the local economy each year.

International trade continues to be a major economic strength for the region. The border between San Diego and Mexico already is the busiest in the world. The San Diego-Tijuana binational economy is further enhanced by NAFTA. Goods moving through the San Diego customs district totaled \$23 billion in 1997. Tijuana has become the television producing capital of North America, if not the world, as Asian manufacturers opened manufacturing facilities in the region because of the inducement of NAFTA advantages.

Manufacturing is the largest contributor to the county's gross regional product, accounting for \$20.5 billion in 1997, an all-time high, according to the Economic Research Bureau of the San Diego Regional Chamber of

Commerce. Major manufacturing areas include ship building and repair, industrial machinery and computers, metals production, and the manufacture of toys and sporting goods.

San Diego County has many notable medical research institutions within its borders, and a variety of significant biomedical and biotechnological developments have emerged from these facilities. With a 22,000 bioscience employment in 239 companies, San Diego is the third largest concentration of bio-tech industry in the United States. Dr. Jonas Salk, founder of the Salk Institute for Biological Studies in La Jolla, developed the polio vaccine in 1955. Advances in health care and medicine continue to come from the Salk Institute, as well as the University of California San Diego, Scripps Clinic and the La Jolla Cancer Research Foundation.

Retail sales totaled nearly \$18.4 billion in 1997. Retail, in general, is expected to continue to grow through the new millennium as millions of square feet of new retail space is projected to be built in the coming years.

San Diego is considered one of the most desirable year-round vacation spots in the nation, and it is regularly ranked in the top ten most popular destinations in the continental United States for international visitors. In 1998 total revenue from visitors topped \$4.7 billion. As a result, service industries have seen continued growth in past years, specifically in areas such as dining, lodging, shopping and recreation services.

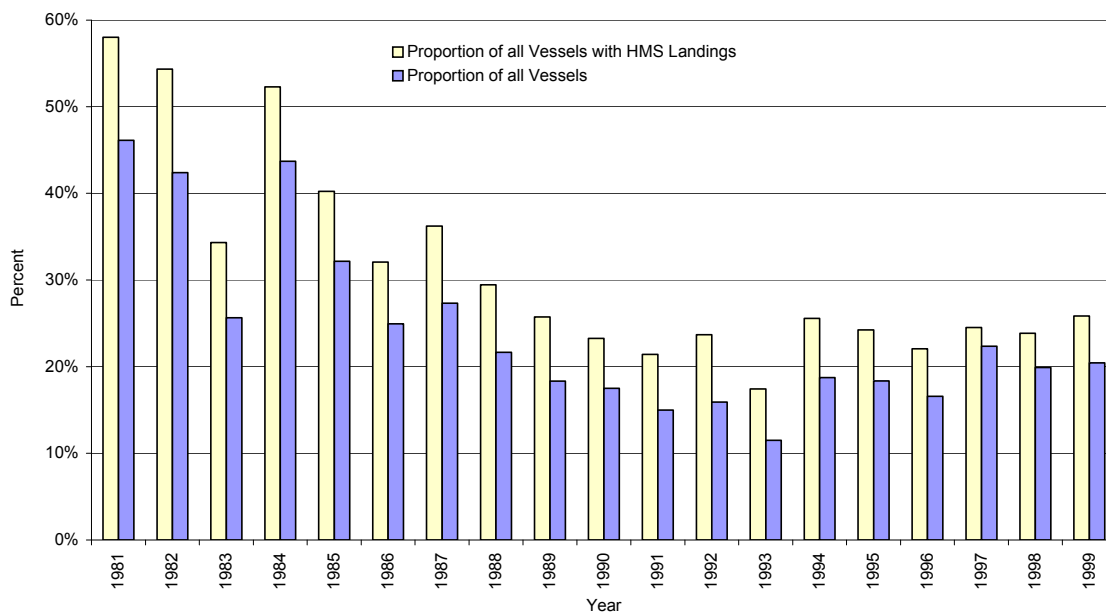
Number of vessels with HMS landings, for which San Diego, CA is their principal port, by their principal species, 1981-99.

Year	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	252	0	1	4	39	73	66
1982	147	1	0	6	58	50	66
1983	23	0	0	4	47	74	52
1984	183	0	0	4	71	16	60
1985	62	2	0	4	61	9	44
1986	7	2	0	3	60	20	36
1987	4	1	0	5	77	13	25
1988	1	6	0	3	63	3	28
1989	2	3	2	3	51	1	47
1990	3	1	0	6	41	6	37
1991	0	0	0	5	37	0	23
1992	1	2	1	2	33	6	24
1993	0	1	0	1	29	0	17
1994	1	1	0	0	42	0	8
1995	1	0	0	3	34	2	10
1996	0	0	0	2	30	2	11
1997	5	1	1	0	28	3	11
1998	2	1	0	0	30	3	19
1999	13	0	0	3	22	0	15

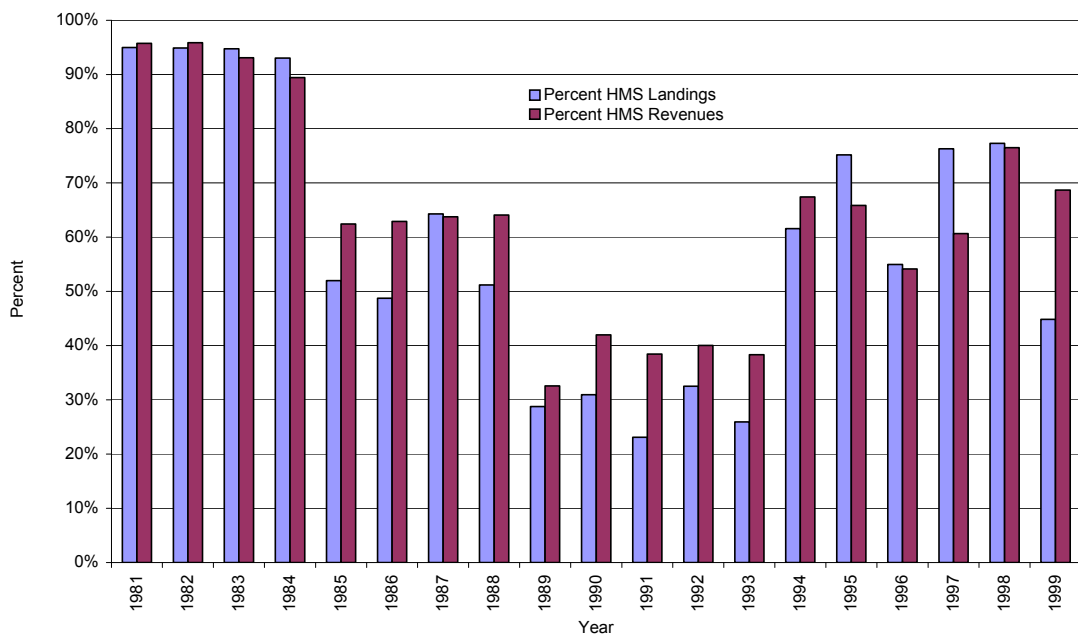
Number of vessels making HMS landings, and HMS landings (mt) and exvessel revenues (1999 \$) by species group, San Diego, CA, 1981-99.

Landings (mt round weight)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	636	1305	127	4	559	301	66606	3027
1982	482	1052	125		927	480	47259	1972
1983	431	210	29		549	511	36093	1420
1984	524	1126	9	3	418	702	16497	1128
1985	343	482	4		451	687	31	1186
1986	287	86	4	2	286	788	272	1184
1987	276	33	62		222	533	1464	880
1988	258	13	8		203	505	457	640
1989	241	6	8		249	374	10	596
1990	245	3	5		254	273	7	736
1991	196	2	1		220	219	3	600
1992	190	3	2		91	157	304	666
1993	178	3	5		71	284	5	507
1994	172		8		115	333	115	273
1995	165	16	1		149	264	344	204
1996	154	1	3		123	224	68	254
1997	155	57	4		210	257	295	224
1998	151	51	19	2	155	307	1011	184
1999	147	135	7	2	102	366	12	170
Exvessel Revenues (1999 \$)								
Year	Number of Vessels	Albacore	Bluefin Tuna	Dorado	Sharks	Swordfish	Tropical Tuna	Non-HMS
1981	636	\$4,504,930	\$287,310	\$4,287	\$943,463	\$2,199,070	\$137,801,467	\$5,281,774
1982	482	\$2,644,985	\$231,496	\$62	\$1,563,121	\$3,494,819	\$89,193,904	\$3,308,382
1983	431	\$508,379	\$49,657	\$658	\$916,626	\$3,206,185	\$51,238,257	\$3,055,959
1984	524	\$2,433,811	\$28,618	\$5,361	\$816,879	\$4,769,136	\$19,127,914	\$2,631,989
1985	343	\$805,882	\$14,484	\$206	\$979,953	\$4,355,165	\$87,875	\$3,060,210
1986	287	\$150,131	\$14,805	\$1,080	\$631,011	\$5,747,038	\$421,946	\$2,879,544
1987	276	\$82,082	\$202,303	\$494	\$582,323	\$4,578,373	\$2,011,033	\$2,413,855
1988	258	\$34,141	\$38,900	\$703	\$546,995	\$4,233,168	\$676,791	\$2,201,541
1989	241	\$17,916	\$49,737	\$550	\$629,644	\$3,026,015	\$39,505	\$2,262,664
1990	245	\$8,568	\$24,951	\$1,230	\$612,640	\$2,078,834	\$21,406	\$2,583,070
1991	196	\$5,914	\$5,797	\$1,102	\$516,252	\$1,656,932	\$12,204	\$2,063,246
1992	190	\$12,700	\$5,641	\$1,692	\$174,599	\$1,023,748	\$1,081,977	\$2,064,541
1993	178	\$5,966	\$19,248	\$2,050	\$149,682	\$1,826,305	\$16,120	\$1,715,752
1994	172	\$2,093	\$28,771	\$43	\$217,987	\$2,254,273	\$127,999	\$881,347
1995	165	\$31,684	\$2,437		\$263,450	\$1,788,637	\$205,928	\$811,437
1996	154	\$1,116	\$8,993	\$269	\$222,775	\$1,319,663	\$69,751	\$964,854
1997	155	\$108,750	\$14,124	\$1,661	\$367,905	\$1,378,787	\$464,481	\$1,242,518
1998	151	\$124,381	\$82,250	\$5,757	\$270,905	\$1,453,812	\$1,015,859	\$772,949
1999	147	\$220,464	\$29,964	\$5,759	\$187,672	\$1,797,294	\$91,809	\$716,347

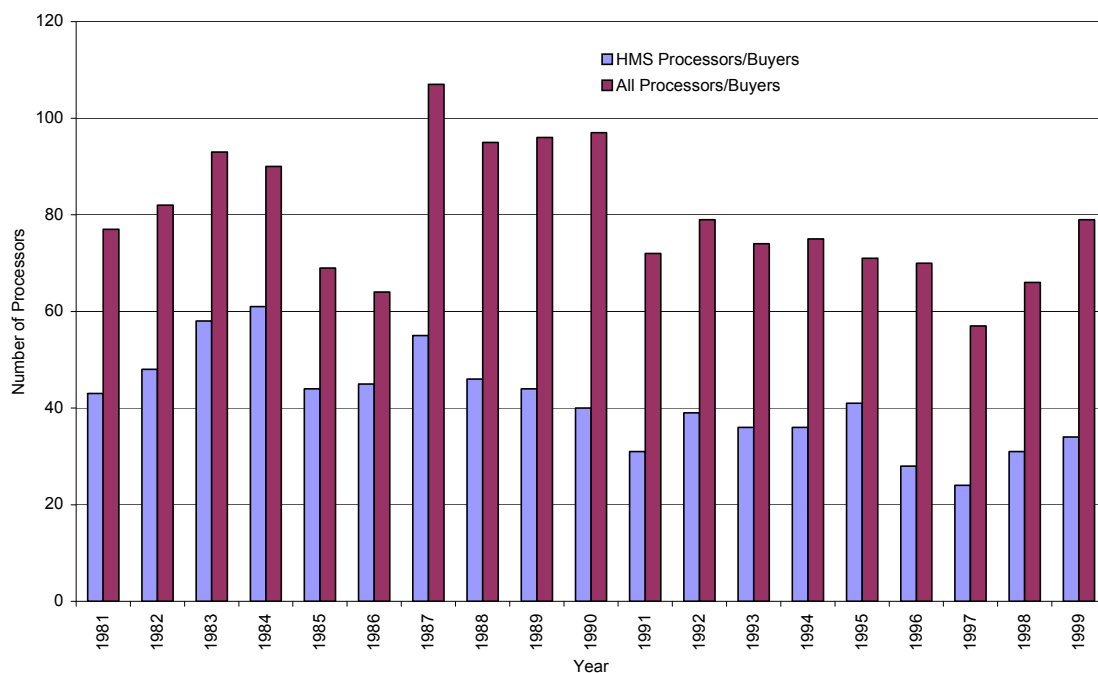
Proportion of vessels whose principal species is a HMS and whose principal port is San Diego, CA of all vessels making HMS landings, and the proportion of these vessels of the total number of vessels making landings in San Diego, 1981-99.



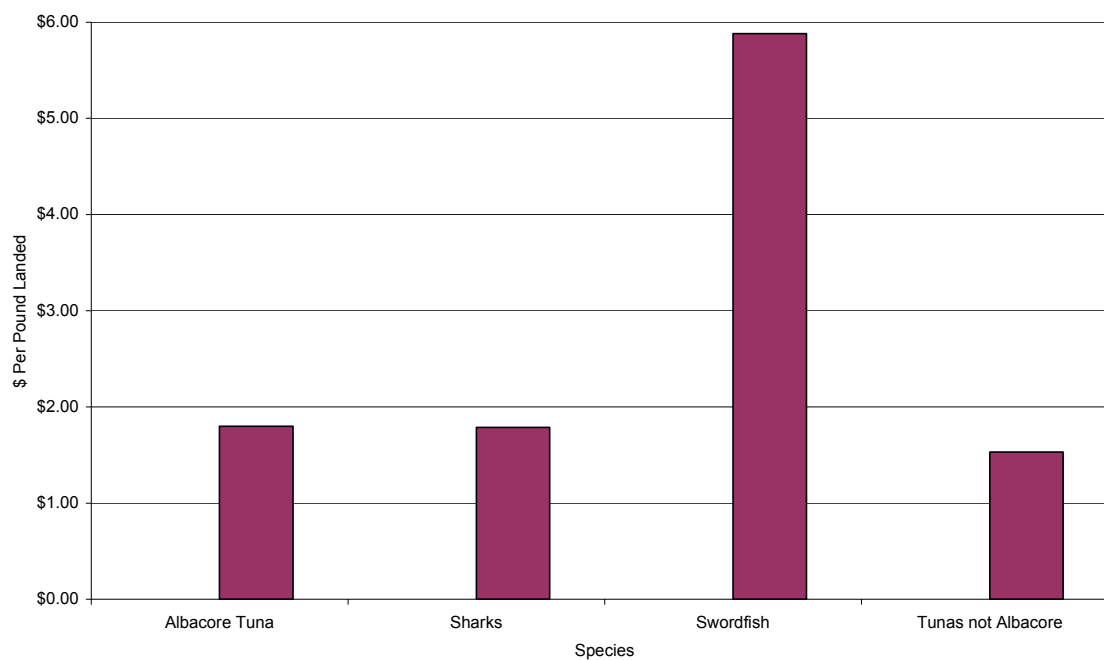
Proportion of HMS landings and exvessel revenues of total landings and exvessel revenues in San Diego, CA 1981-99



Number of processors/buyers in San Diego, CA, 1981-99.



Total income multipliers for landings of HMS of species in the port of San Diego, CA, based on 1996 landings and exvessel revenues.



San Diego County California HMS Communities Demographic Profiles

	County	
	San Diego	
	1990	2000
Population (numbers)	2,498,016	2,813,833
<i>Gender (Percent total population)</i>		
Male	51.0%	50.3%
Female	49.0%	49.7%
<i>Race and Hispanic origin (Percent total population)</i>		
White	74.9%	66.5%
Black	6.4%	5.7%
Native American	0.8%	0.9%
Asian or Pacific Islander	7.9%	9.4%
Other Race	9.9%	12.8%
Hispanic Origin (any race)	20.4%	26.7%
<i>Age Structure (Percent total population)</i>		
Under 5 years	7.8%	7.1%
5-9 Years	7.0%	7.6%
10-14 Years	6.1%	7.1%
15-19 Years	6.9%	7.1%
20-24 Years	10.1%	8.2%
25-34 Years	20.0%	15.8%
35-44 Years	15.2%	16.3%
45-54 Years	8.8%	12.5%
55-59 Years	3.5%	4.1%
60-64 Years	3.6%	3.2%
65-74 Years	6.5%	5.7%
75-84 Years	3.4%	4.2%
85 Years and greater	1.0%	1.3%
Median Age (years)	NA	33.2
18 Years and greater	75.5%	74.3%
Male	38.4%	37.1%
Female	37.1%	37.2%
21 Years and greater	70.0%	69.5%
62 Years and greater	13.1%	13.0%
65 Years and greater	10.9%	11.2%
Male	4.6%	4.7%
Female	6.4%	6.4%
<i>Educational Attainment (Persons 25 years and over)</i>		
Graduate or professional degree	5.5%	NA
Bachelor's degree	10.3%	NA
Associate's degree	5.1%	NA
Some college no degree	16.0%	NA
High school graduate	14.2%	NA
9th to 12th no diploma	6.5%	NA
Less than 9th grade	4.7%	NA
Economic Activity		
<i>Labor Force by Gender (Persons 16 years and over)</i>	53.3%	NA
Males	31.0%	NA
Females	22.2%	NA

San Diego County California HMS Communities Demographic Profiles

	County	
	San Diego	
	1993	1999
Economic Activity (cont'd)		
<i>Employment (numbers)</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	8,092	
Fishing, hunting and trapping (SIC-0900)	218	
Mining (SIC-10)	376	
Construction (SIC-15)	40,905	
Manufacturing (SIC-20)	123,824	
Transportation and Public Utilities (SIC-40)	35,084	
Wholesale Trade (SIC-50)	44,216	
Retail Trade (SIC-52)	189,414	
Finance, Insurance, and Real Estate (SIC-60)	66,960	
Services (SIC-70)	308,192	
Unclassified Establishments (SIC-99)	438	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		869
Fishing (NAICS-11411)		100-249
Finfish fishing (NAICS-114111)		173
shellfish fishing (NAICS-114112)		0-19
Mining (NAICS-21)		510
Utilities (NAICS-22)		3,733
Construction (NAICS-23)		69,633
Manufacturing (NAICS-31)		116,648
Wholesale trade (NAICS-42)		57,854
Retail trade (NAICS-44)		129,028
Transportation & warehousing (NAICS-48)		18,228
Information (NAICS-51)		34,685
Finance & insurance (NAICS-52)		47,963
Real estate & rental & leasing (NAICS-53)		26,458
Professional, scientific & technical services (NAICS-54)		83,377
Management of companies & enterprises (NAICS-55)		15,013
Admin, support, waste mgt, remediation services (NAICS-56)		96,805
Educational services (NAICS-61)		18,107
Health care and social assistance (NAICS-62)		107,615
Arts, entertainment & recreation (NAICS-71)		23,613
Accommodation & food services (NAICS-72)		111,243
Other services (except public administration) (NAICS-81)		48,939
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		4,165
Unclassified establishments (NAICS-99)		1,287
<i>Labor and Proprietor Income (\$1,000)</i>		
Agricultural Services, Forestry, and Fishing (SIC-07)	136,836	
Fishing, hunting and trapping (SIC-0900)	12,427	
Mining (SIC-10)	14,860	
Construction (SIC-15)	1,120,303	
Manufacturing (SIC-20)	4,093,652	
Transportation and Public Utilities (SIC-40)	1,101,077	
Wholesale Trade (SIC-50)	1,379,777	
Retail Trade (SIC-52)	2,718,047	
Finance, Insurance, and Real Estate (SIC-60)	1,976,879	
Services (SIC-70)	7,512,006	
Unclassified Establishments (SIC-99)	9,186	

San Diego County California HMS Communities Demographic Profiles

	County	
	San Diego	
	1993	1999
Economic Activity (cont'd)		
<i>Labor and Proprietor Income (\$1,000) (cont'd)</i>		
Forestry, fishing, hunting, and agriculture support (NAICS-11)		35,290
Fishing (NAICS-11411)		0
Finfish fishing (NAICS-114111)		17,152
shellfish fishing (NAICS-114112)		0
Mining (NAICS-21)		27,991
Utilities (NAICS-22)		226,859
Construction (NAICS-23)		2,437,233
Manufacturing (NAICS-31)		4,725,569
Wholesale trade (NAICS-42)		3,841,150
Retail trade (NAICS-44)		2,882,290
Transportation & warehousing (NAICS-48)		496,210
Information (NAICS-51)		1,729,346
Finance & insurance (NAICS-52)		2,387,976
Real estate & rental & leasing (NAICS-53)		754,028
Professional, scientific & technical services (NAICS-54)		4,365,894
Management of companies & enterprises (NAICS-55)		832,118
Admin, support, waste mgt, remediation services (NAICS-56)		2,127,205
Educational services (NAICS-61)		415,383
Health care and social assistance (NAICS-62)		3,235,241
Arts, entertainment & recreation (NAICS-71)		606,403
Accommodation & food services (NAICS-72)		1,476,769
Other services (except public administration) (NAICS-81)		978,818
 Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		239,521
Unclassified establishments (NAICS-99)		38,867
 <i>Number of Establishments</i>		
Agricultural Services, Forestry, And Fishing (SIC-07)	1,172	
Fishing, hunting and trapping (SIC-0900)	50	
Mining (SIC-10)	39	
Construction (SIC-15)	5,052	
Manufacturing (SIC-20)	3,338	
Transportation And Public Utilities (SIC-40)	1,825	
Wholesale Trade (SIC-50)	4,099	
Retail Trade (SIC-52)	13,810	
Finance, Insurance, And Real Estate (SIC-60)	6,975	
Services (SIC-70)	23,065	
Unclassified Establishments (SIC-99)	521	
Forestry, fishing, hunting, and agriculture support (NAICS-11)		142
Fishing (NAICS-11411)		47
Finfish fishing (NAICS-114111)		43
shellfish fishing (NAICS-114112)		4
Mining (NAICS-21)		49
Utilities (NAICS-22)		68
Construction (NAICS-23)		5,665
Manufacturing (NAICS-31)		3,522
Wholesale trade (NAICS-42)		4,218
Retail trade (NAICS-44)		9,274
Transportation & warehousing (NAICS-48)		1,137
Information (NAICS-51)		1,173
Finance & insurance (NAICS-52)		3,749
Real estate & rental & leasing (NAICS-53)		3,982
Professional, scientific & technical services (NAICS-54)		8,343
Management of companies & enterprises (NAICS-55)		381
Admin, support, waste mgt, remediation services (NAICS-56)		3,828
Educational services (NAICS-61)		719
Health care and social assistance (NAICS-62)		6,502
Arts, entertainment & recreation (NAICS-71)		784
Accommodation & food services (NAICS-72)		5,430
Other services (except public administration) (NAICS-81)		5,713
Auxiliaries (exc corporate, subsidiary & regional mgt) (NAICS-95)		130
Unclassified establishments (NAICS-99)		1,096

San Diego County California HMS Communities Demographic Profiles

Major HMS Ports	San Diego, San Diego Co.	
	1990	2000
Population (numbers)	1,110,549	1,223,400
<i>Gender (Percent total population)</i>		
Male	51.0%	50.4%
Female	49.0%	49.6%
<i>Race and Hispanic origin (Percent total population)</i>		
White	67.1%	60.2%
Black	9.4%	7.9%
Native American	0.6%	0.6%
Asian or Pacific Islander	11.8%	14.1%
Other Race	11.1%	12.4%
Hispanic Origin (any race)	20.7%	25.4%
<i>Age Structure (Percent total population)</i>		
Under 5 years	7.3%	6.7%
5-9 Years	6.5%	7.1%
10-14 Years	5.8%	6.5%
15-19 Years	7.3%	7.0%
20-24 Years	10.9%	9.0%
25-34 Years	21.1%	17.7%
35-44 Years	15.3%	16.2%
45-54 Years	8.7%	12.1%
55-59 Years	3.4%	3.9%
60-64 Years	3.4%	3.1%
65-74 Years	6.1%	5.4%
75-84 Years	3.2%	3.9%
85 Years and greater	0.9%	1.2%
Median Age (Years)	NA	32.5
18 Years and greater	76.9%	76.0%
Male	39.2%	38.1%
Female	37.8%	37.9%
21 Years and greater	70.8%	70.8%
62 Years and greater	12.3%	12.3%
65 Years and greater	10.2%	10.5%
Male	4.2%	4.4%
Female	6.0%	6.0%
Educational Attainment (Persons 25 years and over)		
Graduate or professional degree	6.6%	NA
Bachelor's degree	12.0%	NA
Associate's degree	5.0%	NA
Some college no degree	15.1%	NA
High school graduate	12.6%	NA
9th to 12th no diploma	6.0%	NA
Less than 9th grade	5.1%	NA
Economic Activity (Percent total population)		
<i>Labor Force by Gender (Persons 16 years and over)</i>	54.7%	NA
Males	31.5%	NA
Females	23.2%	NA

Source: U.S. Bureau of Census

A.4.4 Estimation of Income Impacts

A.4.4.1 Total Income Multipliers

Economic impact assessments indicate the amount of economic activity, in terms of sales, income and employment, that is generated by the business operations of economic entities within a particular geographic region. The economic impacts associated with harvesting and processing of West Coast HMS can be gaged using the output multipliers from the Fishery Economic Assessment Model (FEAM).⁹

The FEAM model estimates provided here for ports, states and the West Coast region are for the amount of personal income generated within these respective areas associated with HMS commercial fishing activity. To the extent that processing activities, the vessel home port, and the homes of workers and employers in the industry are located within the area under consideration, the more likely the income impacts will occur in that area. To the degree that processing activities, the vessel home port, and the homes of workers and employers in the industry are located outside the area, the more likely the income impact estimates overstate income generated in the area. Where landings are made in one port and the vessel is home ported in another port, or the workers live in another area, or where processors transfer product from one area to another, there are likely some cross-impacts between areas that are not measured, or are attributed to the wrong geographic area. Some cross impacts may be offsetting.

The income impact tables and charts presented here and with the community profiles can be used to provide rough estimates of community income effects associated with HMS commercial landings. These income impact estimates should not be used to address issues requiring more precise estimates, such as allocation issues.

The FEAM model provides total income multipliers derived from 1996 landings of West Coast species by port and gear. In the FEAM model total income impacts account for:

Direct income - exvessel income generated in the region of interest by the harvesting sector of the fishing industry from landings by species, by port and by gear;

Indirect income - income generated in the region of interest by all industries, due to the iteration of industries purchasing from industries in response to landings of a particular species at the exvessel level;

Induced income - represents the expenditures from new household income within the region of interest, generated by the direct and indirect income effects of landings of a particular species.

The FEAM model derived, total income multiplier converts a pound of fish landed into the corresponding sum of direct, indirect and induced income. For example, based on 1996 landings and exvessel revenue data from PacFIN, each pound of albacore landed in Washington generated statewide average total income of \$1.93 (see below).

⁹ The Fishery Economic Assessment Model (FEAM) was developed by Dr. Hans Radtke and Dr. William Jensen to estimate local, state and regional marginal and average income impacts for West Coast fishery landings. The FEAM model is based on the U.S. Forest Service IMPLAN model enhanced with fishing sector coefficients specific to West Coast fisheries. Documentation of the FEAM model is available from the Pacific Fishery Management Council.

Statewide total income multipliers (\$ per pound landed) for landings of HMS in Washington, Oregon and California based on 1996 landings and exvessel revenues.

Species	Washington	Oregon	California
Albacore Tuna	\$1.93	\$1.91	\$2.40
Swordfish	NSL	NSL	\$5.21
Shark	\$1.51	\$1.24	\$1.67
Tuna (other than albacore)	NSL	\$2.99	\$1.42
Ave. Non-HMS Species	\$1.87	\$1.61	\$3.01

NSL = no significant landings.

From a regional perspective, each pound of albacore landed in Washington during 1996 generated average total income of \$2.39 along the entire West Coast (see below).

Coastwide total income multipliers (\$ per pound landed) for landings of HMS in Washington, Oregon and California based on 1996 landings and exvessel revenues.

Species	Washington	Oregon	California
Albacore Tuna	\$2.39	\$2.33	\$2.42
Swordfish	NSL	NSL	\$5.26
Shark	\$1.87	\$1.51	\$1.69
Tuna (other than albacore)	NSL	\$3.64	\$1.44
Ave. Non-HMS Species	\$2.32	\$2.03	\$3.04

NSL = no significant landings

Swordfish, shark, albacore and other tunas command comparatively higher exvessel, wholesale and retail prices, since substantial quantities of these species enter the higher end fresh fish retail and restaurant trades. Accordingly, the FEAM model statewide total income multipliers for West Coast landings of HMS are relatively high compared to most other species (see below). Therefore, fishing communities that rely heavily on HMS will experience proportionally greater income impacts due to changes in fishing activity compared to those that are mostly dependent on other species. The bulk of swordfish, shark and other tuna landings occur in southern California ports, while landings of albacore are more evenly distributed by state.

Percentage of statewide total income impacts for HMS landings in Washington, Oregon and California based on 1996 landings and exvessel revenues.

Species	Washington	Oregon	California
Albacore Tuna	9.7%	8.7%	6.1%
Swordfish	NSL	NSL	3.1%
Shark	< 0.1%	< 0.1%	0.4%
Other Tuna	NSL	< 0.1%	9.9%
Ave. Non-HMS	1.8%	2.5%	2.1%

NSL = no significant landings

HMS recreational fishing also has an important impact on local, state and regional economies, although this information has not been as fully developed as that for commercial fisheries. In an investigation of the economic impacts of the San Diego Bay CPFV industry, the London Group (1999) found that in terms of total economic impacts this sector generated 1,200 jobs, \$25.3 million in earnings, and \$49 million in economic output making it a vital contributor to San Diego's economy in 1999 (Table A-62).

A.4.4.2 Interpretation of Income Impact Estimates

Information provided in this and other sections of chapter two on exvessel revenues, numbers of participating vessels, and community income impacts are indicators of the amount of dislocation (expansion) and dislocational (expansionary) costs (benefits) which may occur in the event of reductions (expansions) of HMS fisheries, but are not indicators of the net loss (benefit) to the nation from such reductions (increases). Estimates of income impacts provide an indicator of one measure of value that is comparable to similar indicators often used to describe the value of activities in non-fishing sectors of the economy: the amount of personal income associated with that activity.

If the activity with which the estimated personal income is reduced, the personal income is not necessarily reduced by a proportional amount. The effect on personal income in the local and national economies will depend on alternative activities available and the location of these activities. If there were a reduction in HMS commercial fisheries, over the long run workers in the fishery, vessel and processing plant owners, and consumers of HMS would be expected to adjust to the reductions by changing the activities in which they engage. The net negative effect of a loss in personal income from a reduction in commercial HMS fishing activities would then have to be reduced by some portion of the value generated by the increased economic activity elsewhere in the economy. The effect on the local economy would differ from the effect on the national economy to the degree that the alternative activities were located outside the local community.

The total income multipliers presented here can be used to indicate the magnitude of the potential redirection of money between non-HMS fishing dependent and HMS fishing-dependent sectors that may occur with changes in HMS fisheries. However, the amount of redirection represents a dislocation which may have economic and social costs beyond those that would be captured by applying these total income multipliers or alternatively, by conducting a typical cost-benefit analysis.

A.5 International Fisheries

Numerous foreign fisheries target and catch species covered by this FMP. These fisheries operate throughout the range of the various stocks. With the exception of the Canadian troll fishery for albacore, no foreign fisheries operate in the U.S. EEZ under the jurisdiction of the Pacific Council. However, each of the foreign fisheries exploiting a common stock with U.S. fisheries may have a direct impact on the abundance of the species in question and may, under international management, affect domestic management measures. Because of the implications, an understanding of the major foreign fisheries is desirable.

A.5.1 Foreign Pelagic Longline Fisheries

Foreign longline fisheries in the context of this FMP can be categorized as industrial fisheries and small-scale or artisanal fisheries.

A.5.1.1 Description of Vessels, Gear and Area of Operations

Industrial Longline Fisheries

Currently, Japan, Korea and Taiwan, and to a lesser extent China, operate large, specialized, industrial longline fisheries for catching tropical tunas, temperate tunas and billfish, including swordfish throughout the Pacific Ocean. In the Pacific Ocean alone industrial longline fisheries operate more than 3,800 vessels fishing for HMS. By comparison the U.S. industrial longline fleet operating in the Pacific is estimated not to exceed 120 vessels with the vast majority operating out of Hawaii. The number of foreign vessels currently operating in the Pacific is not precisely known but are estimated for 1996 and 1997 to be (South Pacific Commission 11th SCTB meeting, WP #5):

Fleet	1996	1997
China	323	131
Japan	1,614	1,614
Korea	156	148
Taiwan	1,330	1,930

Both Spain and Chile operate small industrial longline fleets in the EPO. Spain is reported to have approximately 40 vessels operating throughout the mid-1990s with as few as 10 vessels at the end of the decade. Chile had about 120 vessels operating in the early 1990s in the EPO although the numbers declined to 40 or less by 1996.

Industrial longline vessels in the Pacific range in size from 30 to 1,000+ gross t with the smaller vessels being generally home-based. Larger vessels (50 - 1000+ gross t) may be foreign-based or deck-loaded motherships. Most of the larger vessels are modern, have super-cold (-40 to -60C) freezing capability and can remain at sea up to 3-4 months between fueling stops. These vessels may remain away from home port in excess of a year and return to land their frozen catch. Smaller vessels generally fish closer to home ports.

Longline gear consists of a 40 to 80 km long mainline supported by float lines with approximately 2000 baited hooks on branch lines evenly spaced along the mainline. The spacing of the supporting float lines determines the catenary the mainline assumes and hence the fishing depth of the hooks. Longlines can be selective for target species based principally on the depth of the fished hooks. Standard longlines fish at a maximum catenary depth of about 160 m and deep longlines fish at a maximum catenary depth of 300 m (all have a similar, much shallower minimum depth at buoys). Deep longlining is more effective for bigeye tuna (Sakagawa et al. 1987). Longlines are fished nearly around the clock with setting and retrieving operations taking 8 to 10 hours each. Operations centered on night hours generally target swordfish and day time operations target tunas.

In general, longline operations in the higher latitudes (30 to 50 degrees N & S) produce target catches of albacore and swordfish. Fishing in the subtropics produces a mix of yellowfin, bigeye and albacore tunas, marlins and swordfish. Fishing in tropical waters produces catches of bigeye and yellowfin tunas, marlins and limited amounts of swordfish and albacore. High catches of selected species such as bluefin tuna, marlins and swordfish occur in limited time/area strata on the order of 1 or 2 - 5x5 degree squares over a 2 or 3 month period. Industrial longline fisheries operate in the eastern Pacific Ocean (EPO) (east of 150° W longitude to the U.S. EEZ) and in the remainder of the Pacific Ocean (central-western Pacific or CWP).

Small-Scale Longline Fisheries

Small-scale and artisanal longline fisheries are conducted along the West Coast of Mexico, in the Sea of Cortez as well as around CWP islands. A few other small-scale fisheries may exist along the Central and

South American coast line.

The fishery off Mexico is noted as the ponga fishery. Pongas may use longline or gillnet gears and frequently switch. Pongas are small, open, outboard powered vessels 6 to 10 m in length with no fixed facilities. Relatively short longlines of a few miles in length and several hundred hooks are fished on trips 1 or 2 days by 1 or 2 people. The number of pongas operating along the Mexican coast is unknown but likely exceeds 2000 vessels. The fleet is very mobile and often trailered between ports or fishing camps. Vessels seldom range farther than 40 km from shore with most operating closer than 25 km. The fishery targets large and small sharks, swordfish and tunas and lands almost everything caught.

Also operating off Baja California are Mexican longline vessels recently converted from drift gillnet vessels (see section A.5.4 for a description of these vessels). Little is written about the operations of these longline vessels which are considerable bigger than pongas but smaller than high seas industrial longline vessels. Further south in the EPO Chile operates a small artisanal longline fleet in its EEZ. This fleet has declined from a high of 1,038 in 1991 to 40 in 1996 and as few as 14 in 1997.

The small-scale foreign longline fisheries operating in the CWP include fleets from Australia, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Indonesia, Marshall Islands, New Caledonia, New Zealand, Papua New Guinea, Philippines, Solomon Islands, Tonga, and Vanuatu. The aggregate number of vessels in these fleets has varied between 4,000 and 5,000 vessels in the past few years. These vessels in general are small, ranging between 8 and 33 m in length, and have limited or no freezing capacity and tend to operate relatively close to home ports. Fishing operations are the same as described for industrial longline vessels except that the line length and number of hooks is reduced.

A.5.1.2 Catches and Species Caught

The foreign longline fisheries target tunas, billfishes, swordfish, sharks and other species. Table A-82 lists the catch of principal species by gear type by geographic area of the Pacific from 1990 to the present. Albacore are divided into north and south Pacific landings based on assumed stock structure. Bigeye, skipjack and yellowfin tunas are by CWP and EPO areas. In general, adequate statistics are kept for tunas and swordfish. Statistics for marlins, sharks and other species are problematic. Scientific estimates as opposed to official statistics are available in some cases (Table A-82).

A qualitative listing of bycatch species caught in various foreign longline fisheries is generally unavailable. As reported by the SCTB, catch records are incomplete except for target species for many fisheries. However limited observer records are available for some fisheries. Reported catch of non-target and dependent species bycatch for the longline fishery in the CWP was high, at 42% of the total weight landed. Species caught included: blue shark, swordfish, striped marlin, wahoo, sailfish, black marlin, escolar, silky shark, thresher shark, oceanic whitetip shark, and others. No information is available on the catch of protected species.

A.5.2 Foreign Baitboat (Pole-and-line) Fisheries

Foreign baitboat fisheries in the context of this FMP can be categorized as small, or operating in coastal regions or in the vicinity of islands, and large which may also operate on the high seas.

A.5.2.1 Description of Vessels, Gear and Area of Operations

Foreign baitboat fisheries on HMS stocks exist in both the ETP and CWP. In both regions the vessels fish on schooling tropical and temperate tunas. Vessels are generally small with carrying capacities of 100 t or less. These vessels operate in coastal regions or in the vicinity of islands in both the ETP and CWP. The numbers of foreign small baitboats are estimated at 5 in the ETP and 1,550 in the CWP.

In both the ETP and CWP a limited number of large (100-200 plus t capacity) vessels participate in the HMS fishery. These larger vessels may operate on the high seas as well as near shore. Currently the number of these foreign large vessels is estimated at 6 in the ETP and 60 in the CWP.

Countries participating in the baitboat fishery in the ETP in 1996 and 1997 include Ecuador, Mexico, and the United States. Countries participating in the baitboat fishery in the CWP in 1996 and 1997 include Australia, Fiji, French Polynesia, Indonesia, Japan, New Zealand, Palau, Solomon Islands and the U.S.

In the ETP the fishery ranges from the U.S. southern border south to Ecuador in a year-round tropical tuna fishery. In the late spring or early summer baitboats catch bluefin tuna off northern Mexico. In the CWP the tropical tuna fishery operates year round in the tropics and subtropics. A major Japanese baitboat (pole-and-line) fishery for albacore operates in the north Pacific in the first and second quarters of the year extending from Japan across the transition zone to the international date line. Many of these vessels also fish for tropical tunas and the number of vessels fishing for albacore varies from year to year depending on economics, but may range from 80 to 100 in most years, and are included in the totals described above.

Baitboat fisheries for tuna use chummed live bait to attract and hold schools of tuna at the surface. Generally, feathered lures with barbless hooks are attached to sturdy poles, and tuna are lifted quickly from the water in a single smooth movement. The number of poles in action can range from 4 or 5 to more than 20 depending on the size of the vessel. Automatic fishing poles are used on approximately 80% of the largest vessels (200 plus t). Locating an adequate supply of bait fish is an operational limitation for baitboat fisheries. Most bait is caught near shore, "conditioned" to reduce future mortality and transported to the fishing grounds.

A.5.2.2 Catches and Species Caught

The foreign baitboat fisheries target skipjack tuna and to a lesser extent yellowfin, bigeye and albacore tunas. In the CWP, skipjack tuna baitboat catches exceed 200,000 t in recent years with yellowfin tuna catches a distant second at 12,000 t and bigeye tuna catches of 3,500 t. In the north Pacific, baitboat catches of albacore exceed 28,000 t. Table A-82 lists the catch of principal species by gear type by geographic region from 1990 to the present.

Little documented information on bycatch in baitboat fisheries is available other than the description that bycatch levels are very low. Species specifically mentioned as bycatch include dolphinfish and small billfish.

A.5.3 Foreign Purse Seine Fisheries

A.5.3.1 Description of Vessels, Gear and Area of Operations

Both the ETP and the CWP support major tropical tuna purse seine fisheries. In 1997, 194 purse seine vessels operated in the ETP. Twenty five of this total were U.S. vessels. Of these 194 vessels, 120 (including 6 U.S. vessels) are large "class 6" vessels with carrying capacity of 363 t or greater, and many are 1000 t or more. The remainder ranged from 46 t carrying capacity to 363 t. The purse seine fishery operates year round from the U.S. border south to Peru and as far west as 140° W longitude at about 10° N latitude. In recent years the purse seine fishery has had participation from Colombia, Ecuador, Mexico, Panama, Vanuatu, Venezuela, Belize, Cyprus, Honduras, Spain, Taiwan, Costa Rica, Liberia, Bolivia and the U.S.

The CWP had 601 participants in the tropical tuna purse seine fishery in 1997, ranging in capacity from < 46 t to over 2,000 t. The number of large purse seine vessels (>363 t) is estimated to be more than 150, including 35 U.S. vessels. This fishery operates year-round throughout the CWP. Participants in recent years include Australia, Federated States of Micronesia, Japan, Kiribati, Korea, New Zealand, Papua New Guinea, Philippines, Solomon Islands, Taiwan, U.S. and Vanuatu.

Purse seines are variable in size from a few hundred meters to over 2000 m in length and from tens of meters to several hundred meters in depth. Despite size, all purse seines are generally operated in a similar fashion. The vessel rapidly steams around a school of fish paying out the net, often aided by a small skiff attached to the end of the net. The top of the net floats on the surface and bottom of the net is weighted to sink it rapidly. The bottom of the net encircling the fish school is drawn or "purse" by cable forming a bag enclosing the fish. The net is drawn onboard and the fish removed to the hold. These vessels may range from approximately 20 to 30 m in length to over 80 m in length.

A.5.3.2 Catches and Species Caught

The international purse seine fishery targets yellowfin and skipjack tunas, although substantial quantities of bigeye tuna also are taken. Much smaller quantities of bonito, albacore and black skipjack also are taken. In the EPO in 1997, purse seine catches of yellowfin, skipjack and bigeye tunas exceeded 250,000 t, 150,000 t and 50,000 t, respectively. In the CWP in 1997, purse seine catches of yellowfin, skipjack and bigeye tunas exceeded 230,000 t, 600,000 t and 28,000 t, respectively. Table A-81 lists the catch of principal species by gear type by geographic region from 1990 to present. The bycatch may be large for operations on floating objects and smaller for operations on free-swimming schools of fish, and includes small tunas, sea turtles, sharks, and other fishes. In the ETP there is a substantial bycatch of marine mammals which is currently regulated by international agreement.

Since 1976, aquaculture farms in various countries have been developed to raise bluefin tuna for a specific market. Port Lincoln, Australia is probably the best known bluefin aquaculture development, but there are several other operations around the world in Croatia, Malta, Morocco, Spain, Portugal and Mexico.

Mexico's first successful bluefin tuna farm was established in 1997. This farm has been supplied bluefin by U.S. vessels fishing off the coast of California and Mexican vessels fishing off Mexico. In 1998 and 1999, transshipment permits authorized under Section 204(d) of the Magnuson-Stevens Fishery Conservation Act were issued to three Mexican vessels for transshipping bluefin tuna caught by U.S. vessels. The permits were valid for the calendar year, but were never used; however, in those years U.S. vessels harvested bluefin emptied their catch into towing cages, which were then towed to Mexico. Towing fish from U.S. waters is a direct export to Mexico and does not fall within the purview of the U.S. Customs Service. There are no reporting requirements for U.S. vessels; however, in 1998 and 1999, information available indicates that less than 100 mt was delivered, and in 2001 and 2002, less than 200 mt. This was all live fish. The bluefin are fattened and sold at a premium price, mainly to Japan's sashimi market. Farmed bluefin get an average of \$25,000 for 25 to 30 kg fish and \$30,000 for 40-45 kg fish on the Japanese market. Ninety-five percent of the bluefin has been exported to Japan, while the other five-percent was sold primarily in San Diego and Los Angeles restaurants. Exported fish are commonly brought into the U.S. in bond, then flown to Japan.

In the Fall of 2001, a second farm was opened in Mexico, and Mexican fishing authorities have approved the building of four additional farms. These facilities have been granted a quota by Mexico of 120 mt each. Only three cages per farm will be allowed with a volume of 40 t per cage.

In July 2002 a transshipment permit was issued to one Mexican vessel for the purpose of transporting live tuna in a fish cage from U.S. waters south of 38° N. latitude (Pt. Reyes) to the Mexican Exclusive Economic Zone. Foreign vessels have reporting requirements. The permit is valid for calendar year 2002.

A.5.4 Foreign Gillnet Fisheries

Foreign gillnet fisheries in the context of this FMP can be categorized as drift gillnet and gillnet fisheries, the principal distinction being size of nets used (industrial vs artisanal).

A.5.4.1 Description of Vessels, Gear and Area of Operations

A ponga gillnet fishery for sharks and swordfish exists in Mexico's nearshore areas. The ponga fishery uses both longlines and gillnets and is described in A.5.1.1. This fishery lands virtually all fish it catches, with sharks being the main target.

A small drift gillnet fishery operates in the EEZ of Mexico. Approximately 31 vessels participated in the fishery in 1993; no estimates of current participation levels are available, although it is likely to be lower than the 1993 level because the Mexican government is encouraging the conversion of these vessels to longline gear (see A.5.1.1). These vessels are similar in description and operation to those in the California drift gillnet fishery described in section A.2.4.1. Many of these Mexican vessels are reported to be skippered by U.S. fishers.

The drift gillnet fishery begins near Ensenada and the U.S. border in the late summer and moves south along the Baja California peninsula generally remaining within 100 miles of shore. The peak landings from the fishery occur October through February. The fishery operates year-round.

A.5.4.2 Catches and Species Caught

This fishery targets swordfish (12%), sharks (*Alopias* sp., *Isurus oxyrinchus*., unspecified spp; 25%), tunas (19%) and marlins (1%). Reported bycatch from this fishery includes sunfish (19%), sea turtles (2%) and other finfish (22%).

A.5.5 Foreign Troll Fisheries

Numerous troll fisheries exist for both tropical tunas and albacore in the north and south Pacific. Excepting the albacore troll fisheries, most of the troll fisheries are small-scale, and in some cases artisanal.

A.5.5.1 Description of Vessels, Gear and Area of Operations

A foreign troll fishery for north Pacific albacore exists within the EEZ along the U.S. West Coast and is comprised exclusively of Canadian vessels. This fishery is authorized by the U.S./Canada Albacore Treaty (section 1.5.2). The vessels, gear and area of operations are essentially identical to that of the U.S. albacore troll fleet (Section A.2.1). In 1997, 1998 and 1999 approximately 200 Canadian troll vessels applied for permission to fish in U.S. EEZ waters under the U.S./Canada albacore Treaty, with about 20 vessels landing albacore in the U.S. and an unknown number of vessels (>20) actually fishing in the U.S. EEZ and landing in Canada. The total number of Canadian troll vessels fishing for north Pacific albacore both inside and outside the U.S. EEZ is estimated to be greater than 200 vessels.

In the south Pacific, albacore foreign troll fisheries include Australia, French Polynesia, New Zealand, Fiji, Cook Islands, Belize, Sweden, Tonga and Ecuador. The number of vessels participating is not available. Foreign troll fisheries for tropical tunas include Australia, Fiji and others. The number of vessels participating is not available.

A.5.5.2 Catches and Species Caught

Total catches of north Pacific albacore by the Canadian troll fishery were 3,034 mt in 1998. No other foreign troll fisheries reported north Pacific albacore catches.

Catches of south Pacific albacore by foreign troll vessels in 1998 included New Zealand (3,303 mt), French Polynesia (trace), Australia (35 mt) and other (129 mt). Table A-82 lists the catch of principal species by gear type by geographic region from 1990 to the present.

Catches of tropical tunas (yellowfin, bigeye and skipjack tunas) by troll gear are generally small and unavailable or aggregated in reporting statistics. See Report of the 12th Meeting of the Standing Committee on Tuna and Billfish and the Annual Report of the Inter-American Tropical Tuna Commission for catches by miscellaneous gear types.

Bycatch for the north and south Pacific albacore troll fisheries are essentially the same as described for the respective U.S. fisheries. No specific bycatch information is available for the tropical troll fisheries.

A.6 Consumers

Seafood consumption in the U.S. increased 3.6% with Americans consuming 4.2 billion pounds of domestic and imported seafood in 1999, or 15.3 pounds per person; the per capita consumption level of 15.3 pounds per person represents an increase of 0.4 pound from the 1998 level (Figure A-41 and Tables A-83, A-84 and A-85)(NOAA, <http://www.publicaffairs.noaa.gov/releases2000/aug00/noaa00r138.html>).

Of the 15.3 pounds of seafood consumed per person, 10.4 pounds were fresh or frozen fish or shellfish, 4.6 pounds were canned seafood, and 0.3 pounds of seafood was cured. Compared to 1998 figures, that represents a 0.2 pound increase in both the fresh/frozen and canned products. The consumption of shrimp (all preparation) achieved a record 3.0 pounds consumed per person.

Total U.S. supply of edible fishery products on a round weight basis was down 1.3% in 1999. While U.S. landings for human consumption declined by 4.8%, imported fish and shellfish increased 9.0% in 1999, comprising 66% of the seafood consumed in the United States. U.S. exports increased by 11.3%. Inventories of frozen seafood in cold storage dropped slightly, declining 4.9% from the 1998 level. Tuna was the most heavily consumed fish by per capital consumption (Table A-86) (<http://www.annapolisseafoodmarket.com/toptenlist.htm>).

Two studies indicate that California consumers are concerned about the safety and quality of the seafood they buy and prefer to purchase local products when available. The first study, summarized first below, indicates that California consumers are not only interested in the quality and safety of the seafood they eat but also place importance on where that seafood comes from. They are also willing to pay more for seafood labeled from California.

AUS Consultants/ICR Survey Research Group in cooperation with A.E. Sloan & Associates, Inc. sampled 804 California consumers in 1992 about their seafood consumption habits. The results of the survey are summarized below:

- 69% of consumers reported eating seafood at least once a month.
- Nearly one third ate seafood at least once a week.
- Only 6% never ate seafood.
- Household income was a strong determining factor in level of consumption, the higher the income, the more likely the respondent was to buy seafood.
- Of those who considered the seafood origin to be important or very important, the main reason given by 49% was safety. Safety considerations included fear of contamination in certain areas, and safety of the fish itself. 8% specifically said they believed that local seafood would be safer.
- Heavy seafood consumers were significantly more likely than non-users to cite freshness as their reason for considering seafood origin to be important (43% vs. 18%).

- Those with incomes of \$25,000 per year or more were significantly more likely to feel the quality of the fish was an important consideration compared to those making less than \$25,000 (13% vs. 2%).
- When asked about their preference of origin for fish in general, California was preferred more than any other origin, by one-third (33%) of the total respondents. Northern Californians were considerably more favorable toward fish caught in their own state than were those from the south with 41% preferring fish from California waters compared to 27% from the South. The reasons cited were: 25% because it is local and 13% because it supports California industry.
- The heaviest seafood consumers were also the most favorable toward California caught fish with 41% preferring California seafood.
- In total, half of the respondents (50%) indicated that they would purchase California seafood more frequently if it were clearly identified.
- Those living in rural areas were especially interested in the California label with 59% of them saying they would purchase California seafood more often compared to just 45% of suburban dwellers.
- Of those respondents who prefer seafood caught in California or who would purchase it more frequently if it were clearly identified, nearly 3 in 5 (59%) said they would be willing to pay a little more for California fish. In northern California 66% were willing to pay a little more.

The next study began in December 1994 and was a pilot program to determine California consumers willingness to buy California caught and identified or branded seafood product (Marciel A. Klenk pers. com. January 18, 2001). In the study, retailers tested this by placing two trays of the same species side by side and identifying the California catch with the California seafood hallmark. The results from the project indicate that, when clearly identified as local, California seafood generally sells out more quickly than unbranded seafood of the same type.

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Table A-1. Pacific coast commercial landings of highly migratory species by all gears, 1981-99.

Year	Landings (round mt)											
	Tunas					Swordfish	Sharks					Dorado
	Albacore	Yellowfin	Skipjack	Bigeye	Bluefin		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	
1981	13,712	76,091	57,869	1,168	868	749	1,521			182	92	4
1982	5,410	61,769	41,904	968	2,404	1,112	1,848		28	351	27	1
1983	9,574	55,741	44,995	21	764	1,758	1,331	9	96	217	7	1
1984	12,654	35,063	31,251	126	635	2,890	1,279	9	57	160	2	4
1985	7,301	15,025	2,977	7	3,254	3,418	1,190	< 0.5	95	149	1	< 0.5
1986	5,243	21,517	1,361	29	4,731	2,530	974	< 0.5	48	312	2	2
1987	3,160	23,201	5,724	50	823	1,803	562	2	20	403	2	< 0.5
1988	4,908	19,520	8,863	6	804	1,636	500	1	9	322	3	< 0.5
1989	2,214	17,615	4,505	1	1,019	1,357	504	< 0.5	17	255	6	< 0.5
1990	3,030	8,509	2,256	2	925	1,236	357	1	31	373	20	1
1991	1,676	4,178	3,407	7	104	1,029	584		32	219	1	< 0.5
1992	4,885	3,350	2,586	7	1,087	1,546	292	< 0.5	22	142	1	3
1993	6,151	3,795	4,539	26	559	1,771	275	1	44	122	< 0.5	17
1994	10,686	5,056	2,111	47	916	1,700	330	< 0.5	37	128	12	41
1995	6,528	3,038	7,037	49	714	1,161	270	5	31	95	5	5
1996	14,173	3,347	5,455	62	4,688	1,191	319	1	20	96	1	10
1997	11,292	4,775	6,070	82	2,251	1,456	320	35	32	132	1	5
1998	13,785	5,799	5,846	53	1,949	1,386	326	2	11	98	3	3
1999	9,746	1,353	3,759	106	186	2,018	320	10	5	63	< 0.5	17

Source: PacFIN, extracted February 2001.

Table A-2. Pacific coast real commercial exvessel revenues (1999 \$)¹ from highly migratory species landings by all gears, 1981-99.

Year	Revenues (1999 \$)											
	Tunas					Swordfish	Sharks					Dorado
	Albacore	Yellowfin	Skipjack	Bigeye	Bluefin		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	
1981	46,214,203	172,003,933	115,565,817	2,734,919	2,158,763	5,845,295	2,573,703			282,851	102,904	4,471
1982	13,164,727	122,249,698	66,557,622	1,980,116	4,408,996	8,384,960	3,246,131		24,861	555,823	30,826	1,566
1983	19,115,067	93,000,460	57,781,773	72,226	1,670,878	10,668,432	2,317,362	13,282	143,288	361,292	7,178	1,092
1984	26,054,805	56,107,376	37,553,906	264,234	1,370,783	17,644,793	2,488,029	11,649	71,354	287,412	3,722	6,472
1985	12,145,002	21,513,776	3,102,042	25,911	4,129,010	19,642,082	2,659,869	1,049	140,316	283,209	3,268	551
1986	8,829,125	25,179,755	1,291,089	129,428	6,617,652	18,159,263	2,412,670	277	95,211	611,379	1,881	1,080
1987	7,086,028	32,263,343	6,290,665	244,391	2,834,411	15,402,799	1,639,072	2,560	30,564	989,633	2,566	494
1988	12,248,030	34,173,182	12,646,888	34,942	2,765,835	12,983,969	1,309,543	1,097	13,096	868,368	2,923	703
1989	4,859,892	24,113,379	5,088,028	3,069	1,549,116	10,608,024	1,210,414	191	31,554	707,833	4,433	550
1990	6,909,478	10,484,921	2,362,581	10,403	1,400,661	8,780,841	784,663	2,067	42,621	909,241	12,506	2,394
1991	3,346,296	4,722,698	3,130,813	50,591	137,695	7,487,593	1,143,997		29,384	490,548	1,098	1,350
1992	13,198,746	4,159,641	1,624,889	51,444	1,299,239	8,696,030	533,679	693	16,780	265,685	2,056	7,175
1993	13,070,995	5,402,677	3,678,301	236,998	843,847	10,064,131	513,892	519	31,587	248,329	681	47,311
1994	21,963,930	4,949,048	1,916,493	336,130	1,832,070	10,501,538	639,456	46	36,637	270,382	17,572	81,956
1995	12,377,132	3,256,937	5,084,676	276,767	1,131,717	7,025,216	511,068	9,389	26,632	176,736	2,991	5,861
1996	28,583,409	3,392,899	4,185,418	273,321	4,237,228	6,367,029	633,207	1,635	18,633	175,101	616	10,306
1997	20,537,572	5,144,801	5,674,073	370,862	2,859,139	6,340,221	609,480	64,421	35,838	232,826	287	11,193
1998	19,079,049	5,976,776	5,315,106	277,238	3,023,216	6,071,718	573,904	2,635	9,613	175,105	6,094	10,697
1999	17,722,077	1,468,210	2,748,208	644,775	1,061,726	8,405,938	616,963	18,424	5,876	110,480	73	47,854

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.
Source: PacFIN, extracted February 2001.

Table A-3. World catches of the principal market species of tunas, in thousands of metric tons (from FAO yearbooks of fisheries statistics, through the IATTC).

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Pacific Ocean																												
SKJ	308	350	344	445	519	463	555	503	692	594	627	566	568	712	827	658	814	754	939	867	942	1258	1011	1011	1057	1159	1122	1045
YFT	264	217	308	355	361	358	404	388	384	406	395	409	381	388	411	477	535	598	595	649	705	667	728	692	711	627	594	746
BET	84	66	88	90	88	103	129	145	122	129	132	104	109	111	103	124	150	149	121	126	163	143	158	130	142	128	114	147
ALB	85	116	134	136	133	103	147	102	136	103	120	111	110	89	106	107	110	127	131	143	139	98	118	100	118	108	114	137
PBF	21	25	19	16	16	17	16	18	19	23	17	27	26	16	8	11	14	12	7	9	6	6	7	7	9	7	15	11
SBF	21	20	20	14	9	10	11	5	8	10	14	11	7	5	3	3	2	2	2	2	3	2	5	5	4	3	3	2
Total	784	793	913	1056	1127	1054	1262	1160	1360	1265	1305	1229	1202	1319	1458	1381	1625	1642	1795	1797	1958	2174	2028	1946	2040	2032	1962	2089
Atlantic Ocean																												
SKJ	44	70	75	74	111	60	68	109	100	87	106	131	155	134	131	117	124	114	139	114	133	193	152	182	172	160	138	137
YFT	69	70	88	93	108	124	119	127	124	124	126	151	160	161	115	147	136	133	126	151	177	160	153	158	152	139	128	125
BET	41	54	45	55	62	63	48	55	54	48	63	66	73	60	69	75	60	49	57	69	68	70	76	108	114	111	104	87
ALB	70	83	85	76	73	60	78	75	72	74	62	60	73	68	58	76	78	68	69	87	73	56	80	76	68	66	53	52
ABF	15	16	13	14	22	26	28	25	20	17	20	20	24	24	26	26	20	19	25	23	23	23	27	30	36	38	39	36
SBF	4	5	11	8	7	2	5	8	10	12	9	7	6	5	5	4	3	4	2	2	2	3	3	4	2	2	3	<1
Total	244	299	317	320	383	334	347	399	381	362	385	434	491	452	404	444	421	387	418	447	477	507	490	557	543	516	466	438
Indian Ocean																												
SKJ	42	41	36	34	40	35	39	30	30	36	47	47	53	64	103	137	150	169	210	250	218	215	266	249	270	254	238	244
YFT	34	31	30	26	28	28	30	52	45	37	35	37	50	59	97	101	120	132	184	177	199	198	257	349	244	289	272	257
BET	18	17	15	11	21	31	24	32	47	31	31	32	39	44	36	43	47	51	54	45	46	46	39	59	69	94	91	98
ALB	14	6	7	14	15	5	6	10	17	16	12	13	21	17	15	9	28	28	28	16	21	16	20	19	18	17	21	19
SBF	22	26	25	27	31	21	27	26	17	17	24	26	29	37	30	29	22	19	19	14	11	6	5	4	6	7	9	5
Total	129	122	113	112	134	121	125	149	156	138	149	156	192	220	280	318	367	400	495	502	495	482	588	680	606	662	631	622
All oceans																												
SKJ	393	461	455	553	670	558	662	642	822	716	780	744	775	910	1061	912	1088	1037	1289	1231	1294	1667	1430	1442	1498	1573	1497	1426
YFT	368	319	426	474	497	510	554	566	553	567	556	597	591	608	623	724	791	864	904	978	1081	1025	1138	1199	1107	1055	994	1128
BET	143	137	148	157	171	197	201	231	223	208	226	202	222	215	208	242	257	248	232	240	277	260	274	298	324	334	310	332
ALB	169	205	226	225	221	168	230	187	225	193	193	184	205	173	179	193	216	223	228	246	233	170	218	195	204	190	189	208
ABF	15	16	13	14	22	26	28	25	20	17	20	20	24	24	26	26	20	19	25	23	23	23	27	30	36	38	39	36
PBF	21	25	19	16	16	17	16	18	19	23	17	27	26	16	8	11	14	12	7	9	6	6	7	7	9	7	15	11
SBF	47	51	55	49	46	33	43	39	35	39	47	45	41	46	38	35	27	26	23	18	16	12	13	13	11	13	15	8
Total	1156	1214	1343	1488	1644	1509	1734	1709	1897	1764	1840	1819	1884	1992	2143	2143	2413	2429	2707	2746	2930	3162	3106	3183	3190	3210	3059	3149

Table A-4. Catches of bluefin, in metric tons, in the Pacific Ocean.

Year	Western Pacific nations			Eastern Pacific nations					Total
	Surface ¹	Longline ¹	Subtotal ¹	Surface		Longline		Subtotal	
				Commercial ²	Recreational ³	California ⁴	Hawaii ⁵		
1953	11,676	1,998	13,674	4,433	35			4,468	18,142
1954	14,953	1,588	16,541	9,537	8			9,545	26,086
1955	18,987	2,099	21,086	6,173	67			6,240	27,326
1956	27,430	1,242	28,672	5,727	279			6,006	34,678
1957	23,767	1,490	25,257	9,215	52			9,267	34,524
1958	12,330	1,429	13,759	13,934	7			13,941	27,700
1959	11,948	3,667	15,615	6,914	11			6,925	22,540
1960	14,214	5,784	19,998	5,422	1			5,423	25,421
1961	14,977	6,175	21,152	8,116	19			8,135	29,287
1962	14,764	2,238	17,002	11,125	20			11,145	28,147
1963	17,370	2,104	19,474	12,266	6			12,272	31,746
1964	14,603	2,379	16,982	9,211	6			9,217	26,199
1965	15,496	2,062	17,558	6,887	1			6,888	24,446
1966	12,080	3,388	15,468	15,881	16			15,897	31,365
1967	12,983	2,102	15,085	5,862	26			5,888	20,973
1968	14,171	2,340	16,511	5,966	10			5,976	22,487
1969	7,883	1,377	9,260	6,914	12			6,926	16,186
1970	7,505	1,152	8,657	3,951	15			3,966	12,623
1971	8,673	762	9,435	8,354	6			8,360	17,795
1972	7,951	755	8,706	13,335	12			13,347	22,053
1973	8,798	1,270	10,068	10,700	44			10,744	20,812
1974	14,773	3,546	18,319	5,570	47			5,617	23,936
1975	10,836	1,563	12,399	9,556	27			9,583	21,982
1976	9,199	580	9,779	10,628	17			10,645	20,424
1977	12,765	718	13,483	5,458	15			5,473	18,956
1978	21,362	1,074	22,436	5,393	4			5,397	27,833
1979	25,359	1,254	26,613	6,108	9			6,117	32,730
1980	18,488	1,194	19,682	2,933	6			2,939	22,621
1981	29,751	835	30,587	1,084	5			1,089	31,676
1982	24,273	897	25,170	3,145	5			3,150	28,320
1983	18,233	712	18,945	837	16			853	19,798
1984	11,045	363	11,408	858	23			881	12,289
1985	12,472	507	12,979	4,014	41			4,055	17,034
1986	14,599	276	14,875	5,079	6			5,085	19,960
1987	13,771	383	14,154	990	15		0	1,005	15,159
1988	7,677	256	7,933	1,421	3		0	1,424	9,357
1989	10,057	490	10,547	1,117	53		0	1,170	11,717
1990	7,132	409	7,541	1,511	31		0	1,542	9,083
1991	14,656	305	14,961	418	43	<1	0	461	15,422
1992	10,859*	600*	11,459*	1,929	70	<1	0	1,999	13,458*
1993	8,540*	1,283*	9,823*	581	298	4	0	883	10,706*
1994	10,839*	1,864*	12,703*	974	88	5	14	1,081	13,784*
1995	22,015*	593*	22,608*	629	245		27	901	23,509*
1996	10,121*	879*	11,000*	8,222	37		23	8,282	19,282*
1997	8,879*	1,044*	9,923*	2,636	151		24	2,811	12,734*
1998				814*	380*		16	1,210*	

¹ Sources: Data for Japan were obtained from the National Research Institute of Far Seas Fisheries of Japan. Data for Taiwan and the Republic of Korea were obtained from FAO yearbooks of fisheries statistics and data published by the Institute of Oceanography, National Taiwan University, Taipei, Taiwan, and the National Fisheries Research and Development Agency of Korea.

² Sources: 1952-1960, FAO Fish. Rep., 6 (2): 405; 1961-1998, Table 3, minus recreational catch.

³ Sources: 1952-1990, California's Living Marine Resources and their Utilization, California Department of Fish and Game; 1991-1992, California Department of Fish and Game, unpublished data; 1993-1998, Calif. Coop. Ocean. Fish. Inves., Rep., 35-40.

⁴ Source: NOAA Tech. Rep. NMFS 142: page 149 (These data are incomplete.)

⁵ Source: Pelagic Fisheries of the Western Pacific Region, 1998 Annual Report, Western Pacific Fishery Management Council, Honolulu, Hawaii: page 3-57.

* preliminary data

Table A-5. Pacific Ocean and world catches of swordfish (mt), 1971-97.

Year	Chile	Japan	Mexico	Philippines	Republic of China	USA	Other Pacific	T o t a l Pacific	World
1971	200	10,400	-	1,500	1,033	100	200	13,433	26,742
1972	100	10,400	2	1,500	1,005	100	600	13,807	28,167
1973	400	11,100	4	1,700	1,987	300	1,900	17,391	31,983
1974	218	10,498	6	1,848	1,116	295	470	14,451	29,664
1975	137	12,361	-	1,976	1,239	393	158	16,264	31,918
1976	13	15,843	-	1,558	856	39	739	19,048	33,888
1977	32	13,997	-	2,103	902	220	685	17,939	33,357
1978	56	14,333	-	890	779	1,009	634	17,701	38,478
1979	40	13,091	7	3,845	1,060	249	553	18,845	39,368
1980	104	11,953	380	1,716	1,459	489	545	16,646	40,418
1981	294	13,078	1,575	1,940	909	443	348	18,587	39,878
1982	285	11,350	1,365	3,468	1,107	726	348	18,649	43,716
1983	342	12,511	120	2,974	1,268	1,195	360	18,770	46,608
1984	103	11,986	47	2,274	1,387	2,009	352	18,158	53,543
1985	342	13,083	18	2,036	1,429	2,370	148	19,426	59,127
1986	764	14,271	422	2,089	1,357	1,585	70	20,558	61,081
1987	2,059	14,867	550	2,137	744	1,221	184	21,762	67,196
1988	4,455	15,496	613	4,034	796	1,086	239	26,719	81,222
1989	5,824	12,367	690	3,756	2,810	588	258	26,293	79,188
1990	4,955	11,341	2,650	3,187	3,245	2,150	440	27,968	75,588
1991	7,255	9,936	861	3,139	581	4,597	601	26,970	68,048
1992	6,379	15,619	1,160	4,256	800	5,948	489	34,651	82,156
1993	4,712	14,073	806	4,627	1,535	6,981	185	32,919	86,097
1994	3,801	13,530	567	3,641	2,407	4,490	171	28,607	84,685
1995	2,594	11,619	424	4,202	1,671	3,431	416	24,357	92,334
1996	3,145	16,051	428	4,002	1,428	3,695	262	29,011	80,095
1997	4,040	12,200	2,351	5,554	2,349	4,122	1,006	31,617	97,698

Source: IATTC Annual Report 1996 (from FAO yearbooks of fisheries statistics).

Table A-6. Commercial landings of highly migratory species in Washington, 1981-99.

Year	Landings (round mt)											
	Tunas					Swordfish	Sharks					Dorado
	Albacore	Yellowfin	Skipjack	Bigeye	Bluefin		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	
1981	875	N.A.		N.A.				N.A.	N.A.	N.A.	< 0.5	N.A.
1982	266	N.A.		N.A.				N.A.	N.A.	N.A.	< 0.5	N.A.
1983	530	N.A.		N.A.				N.A.	N.A.	N.A.	< 0.5	N.A.
1984	67	N.A.		N.A.				N.A.	N.A.	N.A.	< 0.5	N.A.
1985	172	N.A.		N.A.				N.A.	N.A.	N.A.	< 0.5	N.A.
1986	845	N.A.		N.A.			82	N.A.	N.A.	N.A.	< 0.5	N.A.
1987	529	N.A.		N.A.			65	N.A.	N.A.	N.A.	< 0.5	N.A.
1988	1,900	N.A.		N.A.		2	6	N.A.	N.A.	N.A.	< 0.5	N.A.
1989	855	N.A.		N.A.			3	N.A.	N.A.	N.A.		N.A.
1990	1,225	N.A.		N.A.			< 0.5	N.A.	N.A.	N.A.		N.A.
1991	428	N.A.	< 0.5	N.A.			< 0.5	N.A.	N.A.	N.A.	< 0.5	N.A.
1992	1,864	N.A.	< 0.5	N.A.			1	N.A.	N.A.	N.A.	< 0.5	N.A.
1993	2,167	N.A.		N.A.		1	< 0.5	N.A.	N.A.	N.A.	< 0.5	N.A.
1994	5,377	N.A.		N.A.			< 0.5	N.A.	N.A.	N.A.		N.A.
1995	3,413	N.A.		N.A.		< 0.5	5	N.A.	N.A.	N.A.	< 0.5	N.A.
1996	4,969	N.A.		N.A.			4	N.A.	N.A.	N.A.	< 0.5	N.A.
1997	3,775	N.A.		N.A.			2	N.A.	N.A.	N.A.	< 0.5	N.A.
1998	6,517	N.A.		N.A.			6	N.A.	N.A.	N.A.	< 0.5	N.A.
1999	2,081	N.A.		N.A.	12	4	65	N.A.	N.A.	N.A.		N.A.

Source: PacFIN, extracted February 2001.

Table A-7. Real commercial exvessel revenues (1999 \$)¹ from highly migratory species landings in Washington, 1981-99.

	Revenues (1999 \$)											
	Tunas						Sharks					
							Common	Pelagic	Bigeye	Shortfin		
Year	Albacore	Yellowfin	Skipjack	Bigeye	Bluefin	Swordfish	Thresher	Thresher	Thresher	Mako	Blue	Dorado
1981	2,909,770	N.A.		N.A.				N.A.	N.A.	N.A.	169	N.A.
1982	596,514	N.A.		N.A.				N.A.	N.A.	N.A.	102	N.A.
1983	1,002,286	N.A.		N.A.				N.A.	N.A.	N.A.	201	N.A.
1984	137,861	N.A.		N.A.				N.A.	N.A.	N.A.	11	N.A.
1985	292,000	N.A.		N.A.				N.A.	N.A.	N.A.	183	N.A.
1986	1,348,513	N.A.		N.A.			303,270	N.A.	N.A.	N.A.	170	N.A.
1987	1,160,514	N.A.		N.A.			298,466	N.A.	N.A.	N.A.	580	N.A.
1988	4,666,429	N.A.		N.A.		13,526	31,385	N.A.	N.A.	N.A.	65	N.A.
1989	1,730,680	N.A.		N.A.			10,541	N.A.	N.A.	N.A.		N.A.
1990	2,693,806	N.A.		N.A.			33	N.A.	N.A.	N.A.		N.A.
1991	818,179	N.A.	17	N.A.			287	N.A.	N.A.	N.A.	52	N.A.
1992	5,014,569	N.A.	82	N.A.			655	N.A.	N.A.	N.A.	39	N.A.
1993	4,603,209	N.A.		N.A.		5,907	953	N.A.	N.A.	N.A.	34	N.A.
1994	10,609,267	N.A.		N.A.			102	N.A.	N.A.	N.A.		N.A.
1995	6,429,656	N.A.		N.A.		328	16,541	N.A.	N.A.	N.A.	16	N.A.
1996	9,515,982	N.A.		N.A.			11,619	N.A.	N.A.	N.A.	44	N.A.
1997	7,000,641	N.A.		N.A.			10,922	N.A.	N.A.	N.A.	10	N.A.
1998	8,962,842	N.A.		N.A.			19,243	N.A.	N.A.	N.A.	71	N.A.
1999	3,647,381	N.A.		N.A.	27,772	9,445	144,232	N.A.	N.A.	N.A.		N.A.

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.

Source: PacFIN, extracted February 2001.

Table A-8. Commercial landings of highly migratory species in Oregon, 1981-99.

	Landings (round mt)											
							Sharks					
	Tunas						Common	Pelagic	Bigeye	Shortfin		
Year	Albacore	Yellowfin	Skipjack	Bigeye	Bluefin	Swordfish	Thresher	Thresher	Thresher	Mako	Blue	Dorado
1981	3,505			N.A.				N.A.	N.A.			
1982	863	< 0.5	< 0.5	N.A.				N.A.	N.A.			
1983	1,541	< 0.5	< 0.5	N.A.				N.A.	N.A.			
1984	737	< 0.5		N.A.				N.A.	N.A.			
1985	692			N.A.			2	N.A.	N.A.			
1986	1,116	< 0.5	< 0.5	N.A.			424	N.A.	N.A.			
1987	1,038			N.A.	< 0.5		92	N.A.	N.A.			
1988	1,799			N.A.			81	N.A.	N.A.			
1989	490			N.A.			< 0.5	N.A.	N.A.			
1990	943			N.A.			< 0.5	N.A.	N.A.		< 0.5	
1991	571			N.A.				N.A.	N.A.		< 0.5	
1992	1,764			N.A.			1	N.A.	N.A.		< 0.5	
1993	2,157			N.A.			< 0.5	N.A.	N.A.		< 0.5	
1994	2,131			N.A.				N.A.	N.A.		< 0.5	
1995	2,283	< 0.5	< 0.5	N.A.	< 0.5	3	1	N.A.	N.A.		< 0.5	< 0.5
1996	4,059	< 0.5		N.A.	< 0.5	16	< 0.5	N.A.	N.A.		1	
1997	4,158	< 0.5	< 0.5	N.A.	1	6	< 0.5	N.A.	N.A.		< 0.5	< 0.5
1998	4,808			N.A.	3	35	< 0.5	N.A.	N.A.	1	2	
1999	2,064	< 0.5		N.A.	6	6	1	N.A.	N.A.	< 0.5	< 0.5	

Source: PacFIN, extracted February 2001.

Table A-9. Real commercial exvessel revenues (1999 \$)¹ from highly migratory species landings in Oregon, 1981-99.

Year	Revenues (1999 \$)											
	Tunas					Swordfish	Sharks					Dorado
	Albacore	Yellowfin	Skipjack	Bigeye	Bluefin		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	
1981	11,649,142			N.A.				N.A.	N.A.			
1982	2,073,809	233	164	N.A.				N.A.	N.A.			
1983	2,961,338	118	13	N.A.				N.A.	N.A.			
1984	1,367,247	277		N.A.				N.A.	N.A.			
1985	1,204,367			N.A.			3,064	N.A.	N.A.			
1986	1,891,052	173	4	N.A.			874,406	N.A.	N.A.			
1987	2,319,249			N.A.	9		214,998	N.A.	N.A.			
1988	4,444,898			N.A.			180,477	N.A.	N.A.			
1989	1,142,060			N.A.			19	N.A.	N.A.			
1990	2,167,028			N.A.			664	N.A.	N.A.		69	
1991	1,166,314			N.A.				N.A.	N.A.		73	
1992	4,554,091			N.A.			1,228	N.A.	N.A.		99	
1993	4,350,334			N.A.			498	N.A.	N.A.		130	
1994	4,103,617			N.A.				N.A.	N.A.		93	
1995	4,332,302	336	9	N.A.	454	25,141	1,681	N.A.	N.A.		192	22
1996	7,801,152	9		N.A.	1,203	125,422	234	N.A.	N.A.		438	
1997	7,567,729	536	424	N.A.	3,332	51,790	199	N.A.	N.A.		209	224
1998	6,665,217			N.A.	15,783	263,820	114	N.A.	N.A.	2,726	5,628	
1999	3,782,057	198		N.A.	38,117	46,955	2,588	N.A.	N.A.	787	48	

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 199

Source: PacFIN, extracted February 2001.

Table A-10. Commercial landings of highly migratory species in California, 1981-99.

	Landings (round mt)											
	Tunas						Sharks					
							Common	Pelagic	Bigeye	Shortfin		
Year	Albacore	Yellowfin	Skipjack	Bigeye	Bluefin	Swordfish	Thresher	Thresher	Thresher	Mako	Blue	Dorado
1981	9,333	76,091	57,869	1,168	868	749	1,521			182	92	4
1982	4,281	61,769	41,904	968	2,404	1,112	1,848		28	351	27	1
1983	7,503	55,740	44,995	21	764	1,758	1,331	9	96	217	7	1
1984	11,851	35,063	31,251	126	635	2,890	1,279	9	57	160	2	4
1985	6,437	15,025	2,977	7	3,254	3,418	1,188	< 0.5	95	149	1	< 0.5
1986	3,282	21,517	1,361	29	4,731	2,530	468	< 0.5	48	312	2	2
1987	1,592	23,201	5,724	50	823	1,803	405	2	20	403	2	< 0.5
1988	1,209	19,520	8,863	6	804	1,634	414	1	9	322	3	< 0.5
1989	870	17,615	4,505	1	1,019	1,357	501	< 0.5	17	255	6	< 0.5
1990	862	8,509	2,256	2	925	1,236	356	1	31	373	20	1
1991	677	4,178	3,407	7	104	1,029	584		32	219	1	< 0.5
1992	1,257	3,350	2,586	7	1,087	1,546	291	< 0.5	22	142	1	3
1993	1,826	3,795	4,539	26	559	1,770	275	1	44	122	< 0.5	17
1994	3,177	5,056	2,111	47	916	1,700	330	< 0.5	37	128	12	41
1995	832	3,038	7,037	49	714	1,159	264	5	31	95	5	5
1996	5,146	3,347	5,455	62	4,687	1,175	316	1	20	96	< 0.5	10
1997	3,358	4,774	6,070	82	2,250	1,451	317	35	32	132	< 0.5	5
1998	2,460	5,799	5,846	53	1,946	1,351	319	2	11	98	1	3
1999	5,601	1,353	3,759	106	168	2,008	253	10	5	62	< 0.5	17

Source: PacFIN, extracted February 2001.

Table A-11. Real commercial exvessel revenues (1999 \$)¹ from highly migratory species landings in California, 1981-99.

Year	Revenues (1999 \$)											
	Tunas					Swordfish	Sharks					Dorado
	Albacore	Yellowfin	Skipjack	Bigeye	Bluefin		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	
1981	31,655,291	172,003,933	115,565,817	2,734,919	2,158,763	5,845,295	2,573,703			282,851	102,736	4,471
1982	10,494,404	122,249,465	66,557,458	1,980,116	4,408,996	8,384,960	3,246,131		24,861	555,823	30,724	1,566
1983	15,151,442	93,000,342	57,781,760	72,226	1,670,878	10,668,432	2,317,362	13,282	143,288	361,292	6,977	1,092
1984	24,549,696	56,107,098	37,553,906	264,234	1,370,783	17,644,793	2,488,029	11,649	71,354	287,412	3,712	6,472
1985	10,648,635	21,513,776	3,102,042	25,911	4,129,010	19,642,082	2,656,805	1,049	140,316	283,209	3,086	551
1986	5,589,560	25,179,582	1,291,085	129,428	6,617,652	18,159,263	1,234,993	277	95,211	611,379	1,711	1,080
1987	3,606,265	32,263,343	6,290,665	244,391	2,834,402	15,402,799	1,125,608	2,560	30,564	989,633	1,986	494
1988	3,136,703	34,173,182	12,646,888	34,942	2,765,835	12,970,443	1,097,681	1,097	13,096	868,368	2,858	703
1989	1,987,152	24,113,379	5,088,028	3,069	1,549,116	10,608,024	1,199,853	191	31,554	707,833	4,433	550
1990	2,048,645	10,484,921	2,362,581	10,403	1,400,661	8,780,841	783,966	2,067	42,621	909,241	12,437	2,394
1991	1,361,802	4,722,698	3,130,796	50,591	137,695	7,487,593	1,143,710		29,384	490,548	973	1,350
1992	3,630,086	4,159,641	1,624,806	51,444	1,299,239	8,696,030	531,795	693	16,780	265,685	1,918	7,175
1993	4,117,452	5,402,677	3,678,301	236,998	843,847	10,058,223	512,441	519	31,587	248,329	517	47,311
1994	7,251,046	4,949,048	1,916,493	336,130	1,832,070	10,501,538	639,353	46	36,637	270,382	17,479	81,956
1995	1,615,174	3,256,601	5,084,667	276,767	1,131,264	6,999,746	492,846	9,389	26,632	176,736	2,782	5,839
1996	11,266,275	3,392,890	4,185,418	273,321	4,236,024	6,241,607	621,354	1,635	18,633	175,101	135	10,306
1997	5,969,201	5,144,266	5,673,649	370,862	2,855,807	6,288,431	598,359	64,421	35,838	232,826	67	10,969
1998	3,450,990	5,976,776	5,315,106	277,238	3,007,433	5,807,898	554,547	2,635	9,613	172,379	395	10,697
1999	10,292,638	1,468,011	2,748,208	644,775	995,837	8,349,538	470,142	18,424	5,876	109,693	26	47,854

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.

Source: PacFIN, extracted February 2001.

Table A-12. Landings (round mt) in the Pacific coast albacore surface hook-and-line fishery, 1981-99.

Year	Albacore	Tropical Tunas & Bluefin	Swordfish	HMS Sharks	Dorado	Groundfish	Coastal Pelagics	Crab	Salmon	Other	Total
1981	13,421	12		< 0.5	< 0.5	4	2		37	3	13,479
1982	4,974	3	4	2	1	4	< 0.5		3	1	4,992
1983	3,909	1	3	1	< 0.5	10	2		11	3	3,940
1984	7,028	6	< 0.5	< 0.5	< 0.5	4	1		1	1	7,041
1985	6,184	2	9	4	< 0.5	4	< 0.5		1	1	6,205
1986	4,479	2	1	< 0.5		20	< 0.5	< 0.5	2	< 0.5	4,504
1987	2,486	< 0.5	1	< 0.5		1	1		1	1	2,491
1988	4,274	< 0.5	13	2		1	< 0.5		2	< 0.5	4,292
1989	2,130	1	7	8	< 0.5	9		< 0.5	2	2	2,159
1990	2,926	< 0.5	2	< 0.5	< 0.5	3	< 0.5		1	1	2,933
1991	1,638	< 0.5				< 0.5		< 0.5	1	< 0.5	1,639
1992	4,675	< 0.5	13	2	< 0.5	6			1	1	4,698
1993	5,723	14	90	5	9	4			3	5	5,853
1994	10,557	< 0.5	1	< 0.5	< 0.5	1			< 0.5	< 0.5	10,559
1995	6,472	1	1	< 0.5	< 0.5	< 0.5	< 0.5		8	1	6,483
1996	14,075	42	< 0.5	< 0.5		< 0.5			10	1	14,128
1997	11,222	7	1	1	< 0.5	5	< 0.5		12	4	11,252
1998	13,557	115	4	3	< 0.5	2	< 0.5		5	2	13,688
1999	9,519	20	12	1	< 0.5	1	< 0.5		2	5	9,560

Source: PacFIN, extracted February 2001.

Table A-13. Real exvessel revenues (1999 \$)¹ for the Pacific coast albacore surface hook-and-line fishery, 1981-99.

Year	Albacore	Tropical Tunas & Bluefin	Swordfish	HMS Sharks	Dorado	Groundfish	Coastal Pelagics	Crab	Salmon	Other	Total
1981	45,214,132	27,211		301	125	3,614	1,648		232,028	6,570	45,485,629
1982	12,034,627	7,673	21,666	4,541	913	8,847	20		22,674	1,745	12,102,706
1983	7,993,629	3,876	11,715	1,634	52	13,300	2,098		40,376	6,630	8,073,310
1984	15,037,144	14,824	2,018	592	334	8,557	694		7,334	2,547	15,074,044
1985	10,351,987	5,217	34,282	9,595	9	8,038	288		11,200	2,606	10,423,222
1986	7,490,115	8,701	9,172	257		26,315	151	37	13,082	773	7,548,603
1987	5,579,586	1,509	7,075	102		2,034	817		9,377	474	5,600,974
1988	10,606,528	917	93,430	4,194		1,024	820		12,694	874	10,720,481
1989	4,663,354	1,804	44,296	14,478	31	20,991		25	10,645	2,919	4,758,543
1990	6,649,931	97	16,381	688	21	7,572	105		3,430	1,660	6,679,885
1991	3,259,841	84				224		664	4,112	258	3,265,183
1992	12,483,181	599	61,928	2,715	323	6,997			7,039	2,605	12,565,387
1993	12,060,709	152,096	496,024	8,955	26,013	5,593			11,636	22,545	12,783,571
1994	21,721,048	660	7,439	330	197	646			588	376	21,731,284
1995	12,278,606	978	3,487	185	22	150	17		23,844	3,241	12,310,530
1996	28,434,020	40,526	2,738	309		462			27,851	1,047	28,506,953
1997	20,419,467	13,241	4,525	1,678	499	12,053	92		38,796	6,088	20,496,439
1998	18,784,010	140,645	17,457	5,117	535	4,882	284		16,659	5,562	18,975,151
1999	17,424,581	80,427	69,269	2,494	1,076	4,347	455		9,742	8,280	17,600,671

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price

Source: PacFIN, extracted February 2001.

Table A-14. Fishery statistics for the U.S. South Pacific albacore troll fishery.

Fishing Season	No. Trips	Catch (mt)	Number of Days	Number of Vessels
1988-89	81	3,280	3,990	42
1989-90	76	3,922	3,686	39
1990-91	73	5,540	7,097	54
1991-92	56	3,055	6,553	54
1992-93	43	1,036	4,433	44
1993-94	12	530	1,043	13
1994-95	42	2,092	1,993	21
1995-96	48	2,186	4,378	53
1996-97	25	1,403	2,910	27
1997-98	39	1,764	5,379	37
1998-99	24	1,200	2,166	20

Source: Childers and Miller (2000)

Table A-15. Canadian commercial albacore troll vessels, trips and landing at U.S. West Coast ports, 1995-99.

Year	No. of Vessels	Number of Trips ¹	Albacore Landings (mt)
1995	4	7	67
1996	66	178	1,261
1997	33	53	399
1998	29	67	961
1999	53	106	588

¹Number of fishing trips denotes number of landings, i.e. it is assumed that each landing (transaction) represents a single trip.

Source: Southwest Fisheries Science Center

Table A-16. Percentages of catch and effort by fishing areas (U.S. EEZ, Canada EEZ and high seas) for U.S. albacore troll vessels.

Year	Catch				Effort			
	U.S. EEZ	Canada EEZ	H i g h Seas	Total	U.S. EEZ	Canada EEZ	H i g h Seas	Total
1989	36	42	22	100	55	28	17	100
1990	9	42	49	100	21	44	35	100
1991	3	32	65	100	10	34	56	100
1992	59	8	33	100	60	8	32	100
1993	53	4	43	100	56	4	40	100
1994	22	11	67	100	35	13	52	100
1995	6	6	88	100	18	12	70	100
1996	14	<1	86	100	28	<1	72	100
1997	16	3	81	100	29	4	67	100
1998	15	<1	85	100	27	<1	73	100
1999	66	1	33	100	62	2	36	100

Source: Voluntary logbooks with trip coverage rates of 9-38% per year.

Table A-17. Percentages of catch and effort by fishing areas (U.S. EEZ, Canada EEZ and high seas) for Canadian albacore troll vessels.

Year	Trips	Catch				Effort			
		U . S . EEZ	Canada EEZ	H i g h Seas	Total	U . S . EEZ	Canada EEZ	H i g h Seas	Total
1989	0	0	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	0	0	0	0	0
1992	6	73	27	0	100	72	28	0	100
1993	*	*	*	*	*	*	*	*	*
1994	3	3	97	0	100	12	88	0	100
1995	4	4	30	66	100	10	43	47	100
1996	27	48	<1	52	100	65	2	33	100
1997	13	27	<1	73	100	44	<1	56	100
1998	26	17	1	82	100	22	5	73	100
1999	13	78	9	13	100	80	12	8	100

Note: * denotes < 3 trips and hence cannot be reported.

Source: Data are from voluntary logbooks with unknown coverage rate.

Table A-18. Landings (round mt) of the albacore surface hook-and-line fishery in Washington, 1981-99.

Year	Albacore	Tropical Tunas & Bluefin	Swordfish	HMS Sharks	Dorado	Groundfish	Coastal Pelagics	Crab	Salmon	Other	Total
1981	875				N.A.	1			9	< 0.5	885
1982	266				N.A.					< 0.5	266
1983	530				N.A.	1			4	< 0.5	535
1984	67				N.A.					< 0.5	67
1985	172				N.A.					< 0.5	172
1986	845				N.A.					< 0.5	845
1987	529				N.A.					< 0.5	529
1988	1,900		1		N.A.	< 0.5	< 0.5		< 0.5	1	1,902
1989	855				N.A.	< 0.5				< 0.5	855
1990	1,225				N.A.					< 0.5	1,225
1991	428	< 0.5			N.A.	< 0.5			< 0.5	< 0.5	428
1992	1,864	< 0.5			N.A.	< 0.5				< 0.5	1,864
1993	2,167		1	< 0.5	N.A.	< 0.5			< 0.5	1	2,169
1994	5,377				N.A.					< 0.5	5,377
1995	3,413		< 0.5		N.A.				1	< 0.5	3,414
1996	4,969				N.A.					< 0.5	4,969
1997	3,775				N.A.	< 0.5				< 0.5	3,775
1998	6,517				N.A.					< 0.5	6,517
1999	2,081	12			N.A.					< 0.5	2,093

Source: PacFIN, extracted February 2001.

Table A-19. Real exvessel revenues (1999 \$)¹ from albacore surface hook-and-line fishery landings in Washington, 1981-99.

Year	Albacore	Tropical Tunas & Bluefin	Swordfish	HMS Sharks	Dorado	Groundfish	Coastal Pelagics	Crab	Salmon	Other	Total
1981	2,909,770				N.A.	549			50,661	34	2,961,014
1982	596,514				N.A.					< 0.5	596,514
1983	1,002,286				N.A.	596			6,889	< 0.5	1,009,771
1984	137,861				N.A.					< 0.5	137,861
1985	292,000				N.A.					< 0.5	292,000
1986	1,348,513				N.A.					< 0.5	1,348,513
1987	1,160,514				N.A.					49	1,160,563
1988	4,666,429		8,944		N.A.	38	820		68	69	4,676,368
1989	1,730,680				N.A.	19				< 0.5	1,730,699
1990	2,693,806				N.A.					< 0.5	2,693,806
1991	818,179	17			N.A.	5			1,034	1	819,236
1992	5,014,569	82			N.A.	7				64	5,014,722
1993	4,603,209		5,907	950	N.A.	187			31	73	4,610,357
1994	10,609,267				N.A.					< 0.5	10,609,267
1995	6,429,656		328		N.A.				1,903	38	6,431,925
1996	9,515,982				N.A.					< 0.5	9,515,982
1997	7,000,641				N.A.	13				< 0.5	7,000,654
1998	8,962,842				N.A.					< 0.5	8,962,842
1999	3,647,381	26,351			N.A.					153	3673885

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.

Source: PacFIN, extracted February 2001.

Table A-20. Landings (round mt) of the albacore surface hook-and-line fishery in Oregon, 1981-99.

Year	Albacore	Tropical Tunas & Bluefin	Swordfish	HMS Sharks	Dorado	Groundfish	Coastal Pelagics	Crab	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	< 0.5	1,117
1987	1,038								1	< 0.5	1,038
1988	1,795					< 0.5			2	< 0.5	1,797
1989	490					< 0.5			< 0.5	< 0.5	490
1990	943					< 0.5	< 0.5		1	< 0.5	944
1991	571								1	< 0.5	571
1992	1,764			< 0.5		< 0.5			1	< 0.5	1,765
1993	2,157					1			3	< 0.5	2,160
1994	2,131			< 0.5					< 0.5	< 0.5	2,131
1995	2,283	1			< 0.5	< 0.5			6	< 0.5	2,290
1996	4,059	< 0.5				< 0.5			10	< 0.5	4,069
1997	4,158	< 0.5			< 0.5	1			9	1	4,169
1998	4,808			< 0.5		1			4	< 0.5	4,813
1999	2,064	4		< 0.5		< 0.5			2	< 0.5	2,070

Source: PacFIN, extracted February 2001.

Table A-21. Real exvessel revenues (1999 \$)¹ from albacore surface hook-and-line fishery landings in Oregon, 1981-99.

Year	Albacore	Tropical Tunas & Bluefin	Swordfish	HMS Sharks	Dorado	Groundfish	Coastal Pelagics	Crab	Salmon	Other	Total
1981	11,649,142					1,304			152,291	518	11,803,255
1982	2,073,809	397				8			6,282	332	2,080,828
1983	2,960,450	118				2,241	103		26,250	262	2,989,424
1984	1,365,399	277				140			6,467	1,090	1,373,373
1985	1,204,367					12			1,022	493	1,205,894
1986	1,891,052	177				118			4,484	1	1,895,832
1987	2,318,864								5,195	< 0.5	2,324,059
1988	4,435,567					98			12,626	87	4,448,378
1989	1,142,060					50			1,144	< 0.5	1,143,254
1990	2,167,028					128	3		3,383	< 0.5	2,170,541
1991	1,166,314								3,078	42	1,169,434
1992	4,554,091			46		153			5,591	< 0.5	4,559,881
1993	4,350,334					1,018			11,605	< 0.5	4,362,957
1994	4,103,617			29					9	21	4,103,676
1995	4,332,302	345			22	113			21,183	< 0.5	4,353,964
1996	7,801,152	51				399			26,205	< 0.5	7,827,807
1997	7,567,729	959			224	739			29,951	1	7,599,603
1998	6,665,217			< 0.5		824			12,435	49	6,678,525
1999	3,781,266	26,638		67		314			8,140	< 0.5	3,816,424

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, Source: PacFIN, extracted February 2001.

Table A-22. Landings (round mt) of the albacore surface hook-and-line fishery in California, 1981-99.

Year	Albacore	Tropical Tunas & Bluefin	Swordfish	HMS Sharks	Dorado	Groundfish	Coastal Pelagics	Crab	Salmon	Other	Total
1981	9042	12		< 0.5	< 0.5	1	2		3	3	9063
1982	3,845	3	4	2	1	4	< 0.5		2	< 0.5	3,861
1983	1,838	1	3	1	< 0.5	7	2		1	3	1,856
1984	6,226	6	< 0.5	< 0.5	< 0.5	4	1		< 0.5	< 0.5	6,237
1985	5,321	2	9	4	< 0.5	4	< 0.5		1	< 0.5	5,341
1986	2,517	2	1	< 0.5		19	< 0.5	< 0.5	1	2	2,542
1987	919	< 0.5	1	< 0.5		1	1		< 0.5	1	923
1988	579	< 0.5	12	2		< 0.5				1	594
1989	786	1	7	8	< 0.5	9		< 0.5	2	1	814
1990	758	< 0.5	2	< 0.5	< 0.5	3	< 0.5		< 0.5	1	764
1991	639	< 0.5				< 0.5		< 0.5		1	640
1992	1,047	< 0.5	13	2	< 0.5	6			< 0.5	1	1,069
1993	1,399	14	89	5	9	3				5	1,524
1994	3,048	< 0.5	1	< 0.5	< 0.5	1			< 0.5	1	3,051
1995	777	< 0.5	< 0.5	< 0.5		< 0.5	< 0.5		< 0.5	2	779
1996	5,047	42	< 0.5	< 0.5		< 0.5			< 0.5	2	5,091
1997	3,289	7	1	1	< 0.5	5	< 0.5		3	1	3,307
1998	2,231	115	4	3	< 0.5	1	< 0.5		1	4	2,359
1999	5,374	4	12	1	< 0.5	1	< 0.5		< 0.5	4	5396

Source: PacFIN, extracted February 2001.

Table A-23. Real exvessel revenues (1999 \$)¹ from albacore surface hook-and-line fishery landings in California, 1981-99.

Year	Albacore	Tropical Tunas & Bluefin	Swordfish	HMS Sharks	Dorado	Groundfish	Coastal Pelagics	Crab	Salmon	Other	Total
1981	30,655,219	27,211		301	125	1,761	1,648		29,076	6,018	30,721,359
1982	9,364,304	7,276	21,666	4,541	913	8,839	20		16,392	1,413	9,425,364
1983	4,030,893	3,758	11,715	1,634	52	10,463	1,995		7,237	6,367	4,074,114
1984	13,533,884	14,546	2,018	592	334	8,417	694		867	1,457	13,562,809
1985	8,855,620	5,217	34,282	9,595	9	8,026	288		10,178	2,114	8,925,329
1986	4,250,550	8,524	9,172	257		26,196	151	37	8,598	773	4,304,258
1987	2,100,208	1,509	7,075	102		2,034	817		4,182	425	2,116,352
1988	1,504,533	917	84,486	4,194		887				718	1,595,735
1989	1,790,615	1,804	44,296	14,478	31	20,921		25	9,501	2,918	1,884,589
1990	1,789,098	97	16,381	688	21	7,444	102		47	1,660	1,815,538
1991	1,275,348	66				219		664		216	1,276,513
1992	2,914,521	517	61,928	2,669	323	6,837			1,448	2,541	2,990,784
1993	3,107,166	152,096	490,116	8,005	26,013	4,389				22,472	3,810,257
1994	7,008,164	660	7,439	301	197	646			579	355	7,018,341
1995	1,516,649	633	3,159	185		37	17		759	3,202	1,524,641
1996	11,116,886	40,475	2,738	309		63			1,645	1,048	11,163,164
1997	5,851,097	12,282	4,525	1,678	274	11,301	92		8,845	6,088	5,896,182
1998	3,155,951	140,645	17,457	5,116	535	4,057	284		4,225	5,514	3,333,784
1999	9,995,933	27,438	69,269	2,427	1,076	4,033	455		1,603	8,129	10,110,363

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.

Source: PacFIN, extracted February 2001.

Table A-24. Numbers and carrying capacities, in metric tons, of vessels of the eastern Pacific Ocean (EPO) tuna fleet. Information for 1950-1960 is given in Table 4 of the IATTC Annual Report for 1998. The data for 1999 are preliminary.

Year	Seiners		Baitboats		Trollers		Total	
	No.	Ton.	No.	Ton.	No.	Ton.	No.	Ton.
1961	125	27,250	93	9,544	0	0	218	36,794
1962	146	31,163	88	6,093	0	0	234	37,256
1963	159	36,550	108	5,425	3	50	270	42,025
1964	137	36,631	88	4,285	0	0	225	40,916
1965	163	38,728	109	5,249	7	166	279	44,143
1966	133	36,304	113	5,649	2	26	248	41,979
1967	130	36,650	108	5,326	0	0	238	41,976
1968	143	46,012	89	5,215	2	22	234	51,249
1969	153	51,807	69	4,501	3	64	225	56,372
1970	162	61,246	49	3,903	9	160	220	65,309
1971	191	80,668	102	5,054	66	1,375	359	87,097
1972	210	102,022	108	6,085	74	1,762	392	109,869
1973	219	119,734	106	6,219	28	660	353	126,613
1974	234	133,449	111	7,045	7	136	352	140,630
1975	253	148,667	102	6,717	9	165	364	155,549
1976	254	160,197	99	6,414	38	823	391	167,434
1977	253	162,294	79	4,926	37	866	369	168,086
1978	271	164,252	68	4,572	50	1,183	389	170,007
1979	282	167,016	45	3,608	5	101	332	170,725
1980	270	167,855	46	3,479	4	97	320	171,431
1981	251	167,862	39	2,776	2	50	292	170,688
1982	223	152,270	36	2,458	4	119	263	154,847
1983	215	127,640	52	3,145	8	221	275	131,006
1984	175	103,929	40	2,772	0	0	215	106,701
1985	178	117,738	25	2,199	0	0	203	119,937
1986	166	112,606	17	1,760	0	0	183	114,366
1987	178	130,240	28	1,948	0	0	206	132,188
1988	189	133,819	36	2,797	0	0	225	136,616
1989	178	121,277	30	2,678	0	0	208	123,955
1990	174	123,220	22	1,585	0	0	196	124,805
1991	155	106,365	19	1,392	0	0	174	107,757
1992	160	99,971	19	1,377	0	0	179	101,348
1993	152	101,434	15	1,318	0	0	167	102,752
1994	167	104,411	20	1,474	0	0	187	105,885
1995	175	106,019	20	1,524	0	0	195	107,543
1996	183	113,396	18	1,561	0	0	201	114,957
1997	194	125,187	23	1,798	0	0	217	126,985
1998	203	138,025	22	1,894	0	0	225	139,919
1999	202	148,630	14	1,404	0	0	216	150,034

Source: Background Paper A1, 66th IATTC meeting, June 2000

Table A-25. Estimates of the numbers and carrying capacities, in metric tons, of vessels (exclusive of longliners and miscellaneous small vessels) of the EPO tuna fleet in 1998 by flag, gear, and IATTC size class. Each vessel is included in the totals for each flag under which it fished during the year, but is included only once in "Grand total." Therefore the grand totals may not equal the sums of the individual flag entries. PS = purse seiner; BB = baitboat.

		Size class							
		1	2	3	4	5	6	Total	
Flag	Gear	Number						Number	Capacity
Belize	PS			1		1	4	6	*
Colombia	PS			2		1	5	8	5,928
Cyprus	PS						1	1	*
Ecuador	PS		6	13	10	5	33	67	34,383
El	PS					1	1	2	*
Spain	PS						6	6	9,877
Hondura	PS						1	1	*
México	PS			9	1	3	40	53	40,323
	BB	1	4	7				12	1,283
Panamá	PS				3	1	2	6	2,774
Taiwan	PS			1				1	*
USA.	PS		13	4		2	6	25	8,934
	BB	4	5	2				11	772
Vanuatu	PS						12	12	11,769
Venezuel	PS						21	21	22,127
Undocum	PS						2	2	*
Others	-	-	-	-	-	-	-	-	8,664
		Number							
Grand	PS	-	19	30	14	13	127	203	
	BB	5	9	8				22	
	PS+BB	5	28	38	14	13	127	225	
		Capacity							
Grand	PS		1,530	4,286	3,078	4,327	124,804	138,025	
	BB	167	723	1,004				1,894	
	PS+BB	167	2,253	5,290	3,078	4,327	124,804	139,919	

Source: Background Paper A1, 66th IATTC meeting, June 2000

*Asterisks indicate data pooled to avoid revealing the operations of individual vessels or companies.

Table A-26. Preliminary estimates of the numbers and carrying capacities, in metric tons, of vessels (exclusive of longliners and miscellaneous small vessels) of the EPO tuna fleet in 1999 by flag, gear, and IATTC size class. Each vessel is included in the totals for each flag under which it fished during the year, but is included only once in "Grand total." Therefore the "Grand totals" may not equal the sums of the individual flag entries. PS = purse seiner; BB = baitboat.

		Size Class							
Flag	Gear	1	2	3	4	5	6	Total	Capacity
		Number							
Belize	PS			1		1	3	5	*
Colombia	PS			2		1	5	8	5,928
Ecuador	PS		6	12	11	5	36	70	36,458
El Salvador	PS						2	2	*
Spain	PS						5	5	8,916
Guatemala	PS						4	4	*
Honduras	PS						2	2	*
México	PS			8	3	3	40	54	40,633
	BB	1	4	7				12	1,283
Nicaragua	PS						1	1	*
Panamá	PS			2	4	1	4	11	6,801
USA	PS		2	1		2	5	10	6,349
	BB	1	1					2	*
Vanuatu	PS						12	12	12,779
Venezuela	PS						23	23	23,139
Others	-								12,314
		Number							
Grand total--	PS		8	26	18	13	137	202	
	BB	2	5	7				14	
	PS +	2	13	33	18	13	137	216	
		Capacity							
Grand total--	PS		677	3,754	4,092	4,293	135,814	148,630	
	BB	81	412	911				1,404	
	PS +	81	1,089	4,665	4,092	4,293	135,814	150,034	

Source: Background Paper A1, 66th IATTC meeting, June 2000

* Asterisks indicate data pooled to avoid revealing the operations of individual vessels or companies.

Table A-27. Estimated catches by surface gear, in metric tons, of the EPO tuna fleet. YFT = yellowfin; SKJ = skipjack; BET = bigeye; PBF = bluefin; BEP = bonito; ALB = albacore; BKJ = black skipjack; Misc. = other species, including sharks, other tunas, and miscellaneous fishes; CYRA = Commission's Yellowfin Regulatory Area; Outside = area between the CYRA and 150°W. The 1999 data are preliminary.

Year	YFT			SKJ	BET	PBF	BEP	ALB	BKJ	Misc.	Total
	CYRA	Outside	Total								
1961	102,643	0	102,643	68,461	213	8,135	2,908	2,422	0	214	184,996
1962	71,452	0	71,452	68,725	328	11,145	3,243	1,151	0	166	156,210
1963	62,028	0	62,028	95,557	75	12,272	3,123	3,422	0	240	176,717
1964	88,650	0	88,650	59,258	68	9,217	6,702	3,331	5	225	167,456
1965	78,898	0	78,898	78,194	117	6,888	4,049	644	16	155	168,961
1966	80,611	0	80,611	60,482	266	15,897	4,454	1,941	9	422	164,082
1967	79,959	0	79,959	120,655	1,664	5,888	10,044	3,750	0	115	222,075
1968	100,921	1,095	102,016	71,109	2,559	5,976	7,958	4,495	0	126	194,239
1969	111,424	17,434	128,858	59,068	576	6,926	2,950	2,944	0	1	201,323
1970	127,793	27,833	155,626	56,020	1,332	3,966	4,738	4,476	0	27	226,185
1971	102,194	20,645	122,839	104,721	2,566	8,360	9,600	2,490	6	61	250,643
1972	136,515	40,612	177,128	33,409	2,238	13,347	8,872	4,832	601	367	240,793
1973	160,341	44,912	205,253	43,954	1,979	10,744	7,864	2,316	1,674	355	274,139
1974	173,180	37,184	210,364	78,803	890	5,617	4,436	4,783	3,742	985	309,620
1975	158,843	43,299	202,142	123,868	3,723	9,583	16,838	3,332	511	277	360,274
1976	190,216	46,111	236,327	126,161	10,186	10,645	4,370	3,733	1,526	1,327	394,275
1977	182,676	16,140	198,816	86,337	7,055	5,473	11,275	1,963	1,458	1,950	314,327
1978	165,985	14,549	180,534	169,810	11,714	5,397	4,837	1,745	2,162	806	377,005
1979	175,906	13,768	189,674	132,024	7,532	6,117	1,805	327	1,366	1,249	340,094
1980	131,998	27,427	159,425	130,671	15,421	2,939	6,110	601	3,680	953	319,800
1981	157,733	24,080	181,813	119,606	10,091	1,089	5,918	739	1,911	1,010	322,177
1982	106,868	18,216	125,084	98,757	4,102	3,150	2,121	553	1,338	783	235,888
1983	82,026	12,230	94,256	58,142	3,260	853	3,829	456	1,236	1,709	163,741
1984	128,559	16,502	145,061	60,551	5,936	881	3,514	5,351	666	987	222,947
1985	192,543	24,449	216,992	49,460	4,532	4,055	3,604	919	296	536	280,394
1986	228,125	40,149	268,274	63,552	1,939	5,085	490	133	595	1,140	341,208
1987	248,153	24,094	272,247	62,345	776	1,005	3,326	417	557	1,612	342,285
1988	267,263	20,811	288,074	85,326	1,053	1,424	9,550	288	1,267	1,297	388,279
1989	242,342	47,033	289,375	92,374	1,470	1,170	12,095	1	783	1,072	398,340
1990	226,465	46,864	273,329	72,575	4,712	1,542	13,856	184	792	944	367,934
1991	219,525	19,596	239,121	63,260	3,740	461	1,288	834	446	649	309,799
1992	221,309	18,540	239,849	83,964	5,497	1,999	978	255	104	762	333,408
1993	213,258	18,813	232,071	87,357	8,069	879	599	1	104	314	329,394
1994	197,181	22,042	219,223	74,484	29,375	1,062	8,692	85	188	419	333,528
1995	196,220	27,556	223,776	138,239	37,328	874	8,009	465	187	172	409,050
1996	218,021	32,055	250,076	112,210	51,353	8,259	655	83	704	219	423,559
1997	214,277	43,554	257,831	161,809	51,619	2,807	1,104	60	101	148	475,479
1998	238,456	27,804	266,260	143,966	35,048	2,223	1,336	124	528	104	449,589
1999	268,748	29,581	298,329	269,335	35,857	2,742	1,573	167	148	230	608,381

Source: Background Paper A1, 66th IATTC meeting, June 2000

Table A-27. (continued)

Year	Western Pacific			Atlantic and Caribbean				Total, all areas and species
	YFT	SKJ	Misc.	YFT	SKJ	BET	Misc.	
1961	0	0	0	12	101	0	0	185,109
1962	0	0	0	0	0	0	0	156,210
1963	0	0	0	12	1,658	0	2,708	181,095
1964	0	0	0	0	3,956	0	2,866	174,278
1965	0	0	0	45	157	0	1,261	170,424
1966	0	0	0	0	4	0	112	164,198
1967	0	0	0	1,136	491	0	778	224,480
1968	0	0	0	6,686	3,822	15	0	204,762
1969	0	0	0	18,363	4,719	148	0	224,553
1970	0	206	0	9,363	11,879	195	1,624	249,452
1971	0	0	0	4,118	18,286	589	1,651	275,287
1972	0	0	0	12,845	13,423	212	993	268,267
1973	0	0	0	3,852	23,128	114	677	301,910
1974	31	0	0	5,922	19,680	868	160	336,281
1975	0	329	0	14,410	7,537	67	825	383,442
1976	224	4,931	2	2,276	2,577	38	425	404,748
1977	143	6,189	4	8,002	6,400	331	117	335,514
1978	22	7,303	42	10,410	8,510	248	335	403,875
1979	0	4,378	0	3,167	2,809	213	598	351,259
1980	319	5,499	0	5,026	3,873	201	30	334,748
1981	4,870	5,991	0	3,992	4,579	128	169	341,906
1982	5,539	12,158	60	4,991	2,972	344	220	262,171
1983	25,338	50,190	355	9,316	6,116	0	250	255,306
1984	5,331	16,303	487	6,981	5,382	2	176	257,609
1985	900	4,870	7	7,123	3,716	0	37	297,047
1986	1,673	2,482	0	969	1,603	8	14	347,957
1987	1,390	3,109	14	3,632	2,196	24	97	352,746
1988	688	1,775	442	303	183	0	0	391,670
1989	0	0	326	2,682	1,599	0	2	402,949
1990	2,038	8,807	439	2,678	1,761	62	10	383,729
1991	4	1,625	7	5,001	3,412	0	35	319,884
1992	0	0	131	3,164	1,853	28	219	338,803
1993	0	0	150	4,580	4,915	0	83	339,122
1994	6,675	3,105	50	5,135	2,958	0	215	351,666
1995	0	12	609	1,039	594	0	0	411,303
1996	850	1,217	606	2,099	3,147	2	3	431,573
1997	277	1,185	684	2,497	2,978	21	17	483,138
1998	4,001	7,544	298	178	722	4	43	462,379
1999	1,939	8,132	1,529	1,384	670	-	-	622,035

Source: Background Paper A1, 66th IATTC meeting, June 2000

Table A-28. Estimates of catches and landings (mt) of tunas caught by surface gear in the EPO in 1998, by species, vessel flag and location where landed.

anded.

Flag	YFT		SKJ	BET	PBF	BEP	ALB	BSJ	Misc	Total
	CYRA	Outside								
	Catches									
Colombia	13,314	1,101	4,066	526	-	-	-	-	-	19,007
Ecuador	33,053	6,408	68,876	20,178	-	-	-	261	23	128,799
Spain	1,789	3,877	19,273	5,225	-	-	-	-	-	30,164
México	97,223	11,339	18,226	135	1	412	8	85	61	127,490
Panamá	5,114	-	1,990	54	-	-	-	9	-	7,167
U.S.A.--	5,550	477	9,039	3,740	2,222	924	116	76	11	22,155
Vanuatu	16,736	1,863	11,119	3,590	-	-	-	7	-	33,315
Venezuela	60,887	2,467	5,646	237	-	-	--	72	9	69,318
Other-Otros ¹	4,790	272	5,731	1,363	-	-	-	18	-	12,174
Total	238,456	27,804	143,966	35,048	2,223	1,336	124	528	104	449,589
	Landings									
Colombia	47,898	2,589	14,118	2,900	-	-	-	-	20	67,525
Costa Rica	26,064	1,161	2,891	443	-	-	-	-	-	30,559
Ecuador	44,732	9,250	87,642	26,311	-	-	-	-282	22	168,239
Spain	5,037	820	4,905	1,956	-	-	-	-	-	12,718
Mexico	87,438	9,854	16,948	79	34	412	8	85	61	114,919
U.S.A.--	3,630	199	5,525	1,786	2,188	783	115	75	10	14,311
Venezuela	25,022	2,227	1,861	88	-	-	-	-	-	29,198
Other-Otros ¹	2,964	69	1,148	321	-	141	-	-	9	4,652
Total	242,785	26,169	135,038	33,884	2,222	1,336	123	442	122	442,121

Source: Background Paper A1, 66th IATTC meeting, June 2000

¹ Includes Belize, Cyprus, El Salvador, Honduras, Taiwan, and undocumented. This category is used to avoid revealing the operations of individual vessels or companies.

² Includes Peru and unidentified locations. This category is used to avoid revealing the operations of individual vessels or companies.

Table A-29. Estimated Catch (mt) and Fleet Information for the Eastern Pacific Ocean¹ Tuna Fleet

	CYRA	CYRA	Outside ²	Outside ²	Total EPO	Total EPO	Total EPO	Atlantic	Atlantic
Species	2000	1999	2000	1999	2000	1999	Since 25 Dec	2000	1999
YFT	222734	268770	44150	21146	266884	289916	2793	718	1764
SKJ	182765	242886	25605	20512	208370	263398	3643	286	648
BET	50402	38034	19438	5364	69840	43398	1209	1	1
BFT	3655	2628	-	-	3655	2628	-	-	-
BEP	616	1473	-	-	616	1473	-	-	-
ALB	81	647	-	-	81	647	6	-	-
BKJ	129	145	-	-	129	145	2	-	-
Other	143	176	-	-	143	176	20	-	-
Total	460525	554759	89193	47022	549718	7672	1005	2413	

Source: Inter-American Tropical Tuna Commission

Notes: Included in the 69,840 mt of BET are 13,048 mt reported by observers (at sea and in-port but not yet unloaded), and 56,792 mt reported from all sources.

1. Eastern Pacific Ocean = east of 150°W

2. Outside = between 150° W and the CYRA

Table A-30. Preliminary Estimates of the Catches (mt) of Tunas in the EPO 2000 by Species and Vessel Flag.

Flag	YFT: CYRA	YFT: Outside	SKJ	BET	BFT	BEP	ALB	BKJ	Other ¹	Total	% of Total
Columbia	13,126	3,292	6,375	1,056					2	23,851	4
Ecuador	32,284	3,997	107,788	27,730				105	48	171,952	31
Mexico	82,186	20,089	16,022	81	2,985	440	79	2	40	121,924	22
Panama	5,360	466	12,062	3,951				10	29	21,878	4
Spain	3,583	2,002	16,591	17,364						39,540	7
USA	2,999	1,105	10,729	2,025	670	176	2		24	17,730	3
Vanuatu	11,689	2,642	11,094	6,231						31,656	6
Venezuela	58,583	9,254	5,342	226				12		73,417	13
Other	12,924	1,303	22,367	11,176						47,770	9
Total	222,734	44,150	208,370	69,840	3,655	616	81	129	143	549,718	100

Source: Inter-American Tropical Tuna Commission, Report N° 2000-52: Jan 1 - Dec 31, 2000

Notes: Includes mackerel, sharks, other tunas, and miscellaneous fishes.

¹Includes Belize, Bolivia, Guatemala, Honduras and Nicaragua: this category is used to avoid revealing the operations of individual vessels or companies.

Table A-31. West coast landings (round mt) in the Pacific purse seine fishery, 1981-99.

Year	Tunas					Sword-fish	HMS sharks	Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
	Albacore	Yellowfin	Skipjack	Bigeye	Bluefin									
1981	181	75,046	54,338	1,156	853					198			5	131,777
1982	367	60,562	39,812	962	2,400					29			< 0.5	104,131
1983	11	46,556	37,478		629	1	< 0.5			25			5	84,705
1984	3,551	30,172	26,450	116	600	23	1			267			4	61,184
1985	17	14,560	2,498	< 0.5	3,098	1	< 0.5			252			1	20,427
1986	48	20,803	977	5	4,392	38	2			48			54	26,367
1987	27	19,507	4,801	42	708					13			9	25,107
1988	151	17,693	7,088	< 0.5	722					63			2	25,719
1989	23	15,308	3,463		954			< 0.5		29			< 0.5	19,776
1990	71	7,848	2,097		783					108			5	10,912
1991		3,463	2,867		95					94			3	6,522
1992	8	1,698	1,100	1	996	10	2	1	< 0.5	323			9	4,148
1993	1	951	1,619	2	497	17	1	< 0.5	< 0.5	91			11	3,190
1994		3,563	1,283		779					66			131	5,822
1995		2,788	5,488		689					38			39	9,042
1996	11	2,683	5,052		4,639					244			54	12,683
1997	2	4,659	5,843		2,189	1	1	1		33			81	12,810
1998	136	3,753	5,310		1,695					252			160	11,306
1999	47	1,297	3,742		99					56	1		88	5,330

Source: PacFIN, extracted February 2001.

Table A-32. West coast real exvessel revenues (1999 \$)¹ for the Pacific purse seine fishery, 1981-99.

Year	Tunas					Sword- fish	HMS Sharks	Dorado	Ground- fish	Coastal Pelagics	Crab	Salmon	Other	Total
	Albacore	Yellowfin	Skipped	Bigeye	Bluefin									
1981	631,806	169,637,980	108,574,638	2,704,935	2,122,472					205,714			18,864	283,896,409
1982	943,614	119,770,656	63,476,091	1,961,558	4,393,095					8,448			2	190,553,464
1983	24,129	78,219,921	48,131,592		1,398,480	2,823	410			10,435			5,865	127,793,655
1984	7,301,453	49,959,323	32,524,190	214,242	1,260,029	131,937	985			90,795			9,971	91,492,925
1985	34,087	20,669,671	2,504,239	138	3,851,100	10,369	673			56,983			1,402	27,128,662
1986	82,432	24,232,616	919,003	10,636	5,719,860	240,981	3,667			7,586			127,643	31,344,424
1987	61,698	27,116,842	5,276,875	208,526	2,390,742					2,776			28,150	35,085,609
1988	356,261	31,265,084	10,228,235	908	2,337,898					33,854			< 0.5	44,222,239
1989	57,554	20,955,484	3,914,684		1,398,724			164		8,076			71	26,334,757
1990	171,845	9,665,852	2,196,596		1,135,968					37,099			13,642	13,221,002
1991		3,911,109	2,634,597		100,271					42,870			2,703	6,691,550
1992	22,186	1,881,758	619,288	3,366	1,095,944	59,657	4,053	2,987	253	71,408			13,926	3,774,826
1993	1,347	1,177,926	1,173,191	4,739	637,966	110,617	1,792	196	15	18,861			12,928	3,139,578
1994		3,421,538	1,179,959		1,398,177					39,771			140,857	6,180,302
1995		2,988,439	3,967,157		1,009,398					16,763			21,889	8,003,646
1996	919	2,802,860	3,828,518		4,059,268					73,457			26,511	10,791,533
1997	3,923	4,942,784	5,409,976		2,582,329	6,871	1,968	1,468		17,854			57,558	13,024,731
1998	166,112	3,883,123	4,809,357		2,290,429					165,680			111,399	11,426,100
1999	31,237	1,397,578	2,732,409		360,132					5,340	720		59,188	4,586,604

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.
Source: PacFIN, extracted February 2001.

Table A-33. Catch (t) by Purse Seine Vessels for the Central-Western Pacific Ocean, 1975-1999.

Year	Australia			Federated States of Micronesia			Japan		
	Skipjack	Yellowfin	Bigeye	Skipjack	Yellowfin	Bigeye	Skipjack	Yellowfin	Bigeye
1975	1,900	...					6,806	5,595	265
1976	...	...					17,741	7,649	390
1977	...	...					18,629	6,841	302
1978	113	0					25,821	8,523	609
1979	0	0					28,760	19,023	720
1980	17	0					48,820	20,077	564
1981	244	0					44,773	27,539	925
1982	31	0					75,141	31,088	1,129
1983	114	0					117,038	30,830	1,468
1984	56	0					128,975	38,662	702
1985	0	0					119,293	47,947	1,381
1986	-	-					130,900	44,467	1,531
1987	0	0					115,505	44,634	1,602
1988	-	-					183,584	30,119	606
1989	598	26					122,041	40,872	1528
1990	121	0					140,116	37,742	2122
1991	1,954	0		8,448	2624	243	149,987	48579	1951
1992	6,158	0		11,657	3,360	315	140,172	53088	2563
1993	3,855	6		11,585	4,035	383	137,066	57891	1,903
1994	3,219	0		17,531	4,299	320	160,152	39867	1676
1995	4,086	0		5,496	2,026	170	143,182	45160	1,639
1996	1,981	8		7,466	667	94	153,945	23284	1,419
1997	4,204	13		6,051	2,338	222	145,478	57050	8404
1998	1,014	0		10,649	2,393	164	230,294	37785	2,710
1999	4,756	0		6,585	2,801	321	143053	40,329	3,106

Source: South Pacific Commission Tuna Fishery Yearbook 1999. Noumea.

Table A-33. Catch (t) by Purse Seine Vessels for the Central-Western Pacific Ocean, 1975-1999, Continued

Year	Indonesia			Kiribati			Korea		
	Skipjack	Yellowfin	Bigeye	Skipjack	Yellowfin	Bigeye	Skipjack	Yellowfin	Bigeye
1975									
1976									
1977									
1978									
1979									
1980							476	63	5
1981							1,462	539	43
1982							10,167	1,772	270
1983							15,417	699	100
1984							13,767	362	54
1985							9,655	1,463	161
1986	7,121	1366	75				25,305	2,263	164
1987	11,050	1,839	281				40,918	16,472	1,321
1988	11,050	1714	236				64,032	14,323	1,042
1989	10,313	2,141	402				80,903	32,897	1,869
1990							138,460	32,841	2,042
1991							171,951	52,994	2,426
1992							115,290	62,570	4,427
1993							73,989	50,178	2,481
1994				895	202	26	145,541	47,201	2,262
1995				1,961	975	65	137,848	35,310	2,306
1996				4,074	635	68	129,888	18,030	898
1997				2,385	2,000	117	115,927	40,525	2,522
1998				4,669	1,746	83	143,390	55,923	1,592
1999				3,080	888	115	109,773	30,523	1,550

Source: South Pacific Commission Tuna Fishery Yearbook 1999. Noumea.

Table A-33. Catch (t) by Purse Seine Vessels for the Central-Western Pacific Ocean, 1975-1999, Continued.

Year	New Zealand			Papau New Guinea			Philippines		
	Skipjack	Yellowfin	Bigeye	Skipjack	Yellowfin	Bigeye	Skipjack	Yellowfin	Bigeye
1975									
1976									
1977									
1978									
1979									
1980									
1981									
1982							766	414	61
1983	5,581	239	0				-	-	-
1984	3,999	231	0				775	738	108
1985	2,289	170	0				9,148	2,890	441
1986	4,875	0	0				6,989	1,414	216
1987	3,763	...					12,035	3,355	512
1988	3,509	...					8,356	3,124	304
1989	5,769	...					16,668	6,435	1,221
1990	3,972	...					16,466	6,675	860
1991	5,371	...					17,529	8,103	910
1992	988	...					25,888	11,154	1,797
1993	946	...					20,225	8,327	1,182
1994	3,136	...		1,483	253	15	14,742	4,347	570
1995	861	...		12,088	2,813	155	19,810	6,736	1,327
1996	4,520	...		9,461	1,329	63	24,767	8,070	1,203
1997	6,571	...		11,355	6602	1,008	22,553	10,825	1,640
1998	7,308	...		30,178	8,451	1,248	32,071	10,389	1,394
1999	5,261	...		20,515	5,410	826	...	...	...

Source: South Pacific Commission Tuna Fishery Yearbook 1999. Noumea.

Table A-33. Catch (t) by Purse Seine Vessels for the Central-Western Pacific Ocean, 1975-1999, Continued

Year	Russia			Solomon Islands			Spain		
	Skipjack	Yellowfin	Bigeye	Skipjack	Yellowfin	Bigeye	Skipjack	Yellowfin	Bigeye
1975									
1976									
1977									
1978									
1979									
1980				497	393	56			
1981				1,486	1,173	169			
1982				1,598	1,263	181			
1983				2,800	2,212	318			
1984				3,050	2,096	301			
1985	35,254	59,615	1,670	2,824	2,507	375			
1986	3,743	428	4	3,267	1,978	280			
1987	5,614	3,351	30	3,580	3,329	508			
1988	5,339	843	7	6,467	3,867	377			
1989	3,400	1,521	14	5,923	3,607	688			
1990	1,505	616	5	4,417	3,242	426			
1991	2,601	1,104	10	7,056	3,271	368			
1992	1,689	433	4	5,993	4,384	709			
1993	5,499	3,187	28	4,655	4,930	733			
1994	3,310	3,382	30	7,648	4,527	593			
1995				11,212	5,524	1,091			
1996				7,270	8,328	973			
1997				15,947	7,103	1,054			
1998				15,521	5,556	824			
1999				22,563	14,251	2,115	5,670	1,506	1437

Source: South Pacific Commission Tuna Fishery Yearbook 1999. Noumea.

Table A-33. Catch (t) by Purse Seine Vessels for the Central-Western Pacific Ocean, 1975-1999, Continued

	Taiwan			United States			Vanuatu		
Year	Skipjack	Yellowfin	Bigeye	Skipjack	Yellowfin	Bigeye	Skipjack	Yellowfin	Bigeye
1975									
1976				500	188	12			
1977				700	188	12			
1978				800	188	12			
1979				8,000	581	39			
1980				9,900	1,023	77			
1981				21,482	15,164	1,135			
1982				49,705	21,390	1,600			
1983	9,840	1884	276	124,697	49,718	4,950			
1984	20,160	3,413	427	113,755	41,370	4,442			
1985	23,520	3,972	508	83,763	22,422	1,769			
1986	34,400	4,876	724	87,983	30,577	2,591			
1987	44,720	6,325	955	77,575	59,416	4,212			
1988	66,880	8,341	779	93,636	18,832	1,948			
1989	84,800	13,732	2,268	95,027	42,886	2,421			
1990	104,960	20,494	2,546	110,044	52,089	1,762			
1991	140,800	32,026	3,174	177,389	37,330	1,550			
1992	169,400	46,275	4,325	155,898	43,693	3,480			
1993	109,324	58,642	2,733	148,419	46,011	3,731			
1994	134,736	43,061	1,762	151,486	56,426	1,711	656	154	10
1995	147,831	33,156	1,508	132,518	31,845	3,190	6,232	1,289	161
1996	161,407	17,381	817	120,127	19,417	9,860	9,575	1,027	123
1997	116,073	48,189	2,934	79,386	54,638	10,058	15,896	8,474	795
1998	193,728	63,581	1,384	131,564	37,501	5,561	28,869	9,061	501
1999	160,453	41,905	3,372	131,000	34,384	16,673	35,836	9,744	1,147

Source: South Pacific Commission Tuna Fishery Yearbook 1999. Noumea.

Table A-34. Number of Purse Seine Vessels in Central-Western Pacific Tuna Fishery

Year	Australia-Domestic	Australia Distant-Water	Federated States of Micronesia	Indonesia	Japan Coastal	Japan Distant-Water	Kiribati
1973	-	-	-	-	56	6	-
1974	-	-	-	-	52	10	-
1975	-	-	-	-	52	12	-
1976	-	-	-	-	53	15	-
1977	-	-	-	-	50	14	-
1978	3	-	-	-	47	14	-
1979	2	-	-	-	46	17	-
1980	1	-	-	-	50	16	-
1981	2	-	-	-	50	23	-
1982	5	-	-	-	52	33	-
1983	6	-	-	-	59	36	-
1984	4	-	-	...	54	33	-
1985	2	-	-	...	47	35	-
1986	0	-	-	3	53	38	-
1987	1	-	-	3	47	34	-
1988	0	3	-	3	48	39	-
1989	3	1	-	3	43	37	-
1990	1	8	-	...	43	35	-
1991	6	6	6	-	38	35	-
1992	13	2	7	-	31	38	-
1993	7	1	7	-	27	36	-
1994	4	-	8	-	23	33	1
1995	3	-	6	-	20	31	1
1996	4	-	4	-	21	32	1
1997	5	-	4	-	20	35	1
1998	4	-	3	-	20	35	1
1999	7	-	4	-	20	35	1

Table A-34 Number of Purse Seine Vessels in Central-Western Pacific Tuna Fishery, Continued

Year	Korea	Mexico	New Zealand	Papua New Guinea	Philippines Distant-Water
1973		-	-	-	-
1974	-	-	-	-	-
1975	-	-	-	-	-
1976	-	-	-	-	-
1977	-	-	-	-	-
1978	-	-	-	-	-
1979	-	-	-	-	-
1980	2	-	-	-	-
1981	3	-	-	-	-
1982	10	-	-	-	1
1983	11	-	7	-	-
1984	12	1	5	-	3
1985	11	5	5	-	5
1986	13	-	4	-	5
1987	20	-	3	-	5
1988	23	-	4	-	9
1989	30	-	5	-	13
1990	39	-	5	-	13
1991	36	-	5	-	15
1992	36	-	7	-	12
1993	34	-	5	-	12
1994	32	-	7	2	11
1995	30	-	5	3	13
1996	28	-	6	4	12
1997	27	-	7	10	12
1998	26	-	6	13	12
1999	26	-	6	13	12

Table A-34. Number of Purse Seine Vessels in Central-Western Pacific Tuna Fishery, Continued

Year	Russia	Spain	Solomon Islands	Taiwan	United States	Vanuatu
1973	-	-	-	-	-	-
1974	-	-	-	-	-	-
1975	-	-	-	-	-	-
1976	-	-	-	-	3	-
1977	-	-	-	-	1	-
1978	-	-	-	-	2	-
1979	-	-	-	-	8	-
1980	-	-	1	-	14	-
1981	-	-	1	-	14	-
1982	-	-	1	-	24	-
1983	-	-	1	3	62	-
1984	-	-	1	6	61	-
1985	5	-	1	7	40	-
1986	8	-	1	10	36	-
1987	5	-	2	13	35	-
1988	5	-	4	19	31	-
1989	5	-	4	25	35	-
1990	5	-	4	32	43	-
1991	4	-	3	39	43	-
1992	3	-	3	45	44	-
1993	8	-	3	43	42	-
1994	4	-	3	43	49	1
1995	-	-	3	42	44	2
1996	-	-	3	42	40	2
1997	-	-	4	42	35	5
1998	-	-	4	42	39	5
1999	-	8	4	42	36	9

Source: South Pacific Commission Tuna Fishery Yearbook 1999. Noumea.

Table A-35. Fleet Performance Statistics for U.S. Tuna Purse Seiners Fishing in the Central-Western Pacific

Year	Licensed Vessels	Vessels Fishing ¹	Total Trips ²	Days / Trip ²	Sets / Trip ²	Trips / Vessel ²	Carrying Capacity / Vessel (mt) ³
1988	35	31	71	69.42	46.07	2.29	1164
1989	35	35	154	58.07	41.88	4.4	1148
1990	51	43	181	47.32	34.79	4.21	1131
1991	48	43	229	42.38	40.4	5.33	1138
1992	44	44	212	46.32	35.11	4.82	1144
1993	42	42	199	51.92	37.27	4.74	1144
1994	48	49	241	44.11	35.21	4.88	1142
1995	47	44	206	49.14	33.38	4.68	1138
1996	40	39	182	50.09	33.02	4.67	1122
1997	35	35	177	58.05	35.6	5.06	1128
1998	39	39	200	46.58	27.48	5.13	1167
1999	38	36	175	41.54	20.81	4.86	1184

Source: Coan et al. (1999)

¹. The number of vessels that fished can be different from the number of licensed vessels because vessels are licensed from June 15 of one year to June 14 of the next year; whereas, a vessel fishing in a calendar year is recorded as fished in that calendar year.

². Includes all trips that started or ended in the calendar year.

³. Includes bigeye tuna catch.

⁴. Estimated from species composition sampling for 6 months (June to December 1988).

⁵. Data are preliminary.

Table A-36. Catches (mt) and Catch-Per-Unit Effort (mt/day fished) for the U.S. Tuna Purse Seine Fishery in the Central-Western Pacific Ocean

Year	Yellowfin Catch ¹	Skipjack Catch ¹	Bigeye Catch ¹	Total Catch ¹	Yellowfin CPUE ³	Skipjack CPUE ³	Total CPUE ³
1988	18,832	93,636	19,484	114,416	3.01	15.37	18.38
1989	42,886	95,027	2,421	140,334	7.26	14.59	21.85
1990	52,089	110,044	1,762	163,895	8.91	16.66	25.57
1991	37,330	177,389	1,550	216,269	5.7	24.78	30.48
1992	43,693	155,898	3,480	203,071	6.39	21.48	27.87
1993	46,011	148,419	3,731	198,161	6.46	18.29	24.75
1994	56,426	151,486	1,711	209,623	7.63	18.61	26.24
1995	31,845	132,518	3,190	167,553	4.68	17.39	22.07
1996	19,417	120,127	9,860	149,404	4.13	16.93	21.05
1997	54,638	79,386 ²	10,058	144,082	8.45	12.06	20.51
1998	37,501	131,564 ²	5,561	174,626	6.71	21.62	28.33
1999	34,384	131,000 ²	16,673	182,057	8.16	30.11	38.27

Source: Coan et al. (1999)

¹. Includes reported discards in logbooks and cannery rejects.

². Skipjack tuna species composition samples were used to separate the yellowfin and bigeye tuna from the reported skipjack tuna catch in 1997-1999.

³. Includes bigeye tuna catch.

⁴. Estimated from species composition sampling for 6 months (June to December 1988).

⁵. Data are preliminary.

Table A-37. Imports of Canned Tuna for the U.S. (1000 mt)

	1994	1995	1996	1997	1998	1999
Whitemeat	8.1	8.8	9.3	10.1	14.1	17.6
Lightmeat	104.7	88.6	78	86.1	94.9	134.2
Thailand	73.7	51.3	38	38.5	41.4	75.1
Total	112.8	97.4	87.3	96.2	109	151.7

Source: NMFS; GLOBEFISH AN 11032 (*GLOBEFISH Highlights* 1/2000, p. 9)

Table A-38. Average Exvessel Prices for Tuna Delivered to U.S. Canneries by U.S. Vessels, 1950-1997.

	ALBACORE	SKIPJACK	YELLOWFIN
YEAR	.....U.S. \$/short ton.....		
1950	\$380	\$287	\$309
1951	\$315	\$286	\$309
1952	\$346	\$257	\$316
1953	\$398	\$276	\$320
1954	\$402	\$304	\$345
1955	\$324	\$269	\$307
1956	\$342	\$230	\$270
1957	\$289	\$220	\$265
1958	\$410	\$230	\$270
1959	\$372	\$212	\$260
1960	\$295	\$207	\$249
1961	\$356	\$221	\$255
1962	\$330	\$257	\$302
1963	\$300	\$214	\$266
1964	\$309	\$201	\$266
1965	\$306	\$210	\$276
1966	\$370	\$265	\$357
1967	\$382	\$203	\$274
1968	\$396	\$262	\$311
1969	\$426	\$268	\$323
1970	\$524	\$316	\$361
1971	\$630	\$372	\$418
1972	\$680	\$405	\$442
1973	\$830	\$451	\$481
1974	\$820	\$544	\$575
1975	\$675	\$471	\$523
1976	\$945	\$553	\$592
1977	\$1,174	\$710	\$758
1978	\$1,211	\$788	\$840
1979	\$1,294	\$735	\$876
1980	\$1,659	\$1,063	\$1,180
1981	\$1,800	\$1,030	\$1,170
1982	\$1,387	\$965	\$1,123
1983	\$1,268	\$799	\$1,032
1984	\$1,252	\$760	\$982
1985	\$1,087	\$622	\$820

Table A-38. Continued

1986	\$1,108	\$616	\$743
1987	\$1,496	\$716	\$892
1988	\$1,680	\$977	\$1,094
1989	\$1,799	\$807	\$963
1990	\$1,765	\$792	\$982
1991	\$1,530	\$764	\$853
1992	\$2,114	\$680	\$766
1993	\$2,014	\$739	\$835
1994	\$1,906	\$862	\$975
1995	\$2,012	\$743	\$907
1996	\$2,019	\$778	\$916
1997	\$1,900	\$878	\$1,127
1998*	\$1,700	\$750	\$920
1999*	\$1,580	\$602	\$720

*Preliminary

Source: USDOC, NOAA, NMFS, Southwest Region Statistics Program

Note: Nominal prices

Table A-39. U.S. Catches (mt) of Bluefin Tuna in the North Pacific

Year	Baitboat	Purse Seine	Longline	Gillnet
1985	3	3,320	0	6
1986	1	4,851	0	15
1987	0	862	0	2
1988	4	923	0	4
1989	8	1,046	0	3
1990	62	1,380	0	10
1991	0	410	0	4
1992	1	1,828	9	21
1993	5	580	45	56
1994	1	906	24	27
1995	1	619	27	19
1996	2	4,523	53	42
1997	2	2,240	52	57
1998	48	1,771	56	40
1999	3	186	39	21

Source: Purse seine from IATTC

Baitboat from IATTC and PacFIN

Longline from Hawaii and PacFIN

Gillnet from PacFIN

Note: Excludes recreational fish catch.

Table A-40. Landings (round mt) by the west coast drift gillnet fishery in Oregon, 1981-99.

Year	Sword-fish	Sharks					Tunas		Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin							
1981			N.A.	N.A.											
1982			N.A.	N.A.											
1983			N.A.	N.A.											
1984			N.A.	N.A.											
1985		2	N.A.	N.A.										< 0.5	2
1986		423	N.A.	N.A.										< 0.5	423
1987		92	N.A.	N.A.			< 0.5	< 0.5		2				1	95
1988		80	N.A.	N.A.			4			< 0.5				1	85
1989			N.A.	N.A.											
1990			N.A.	N.A.											
1991			N.A.	N.A.											
1992			N.A.	N.A.											
1993			N.A.	N.A.											
1994			N.A.	N.A.											
1995	3	< 0.5	N.A.	N.A.				< 0.5						< 0.5	3
1996	16		N.A.	N.A.				< 0.5						< 0.5	16
1997	6		N.A.	N.A.				1						< 0.5	6
1998	35		N.A.	N.A.	1	1		3						1	41
1999	6	< 0.5	N.A.	N.A.	< 0.5		< 0.5	1		< 0.5				1	8

Source: PacFIN, extracted February 2001.

Table A-41. Real exvessel revenues (1999 \$)¹ from drift gillnet fishery landings in Oregon, 1981-99.

Year	Swordfish	Sharks					Tunas		Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin							
1981			N.A.	N.A.											
1982			N.A.	N.A.											
1983			N.A.	N.A.											
1984			N.A.	N.A.											
1985		3,064	N.A.	N.A.										< 0.5	3,064
1986		872,984	N.A.	N.A.										2,009	874,993
1987		214,683	N.A.	N.A.			159	9		6,176				4,946	225,973
1988		179,894	N.A.	N.A.			9,332			616				106	189,948
1989			N.A.	N.A.											
1990			N.A.	N.A.											
1991			N.A.	N.A.											
1992			N.A.	N.A.											
1993			N.A.	N.A.											
1994			N.A.	N.A.											
1995	25,141	461	N.A.	N.A.				454						< 0.5	26,055
1996	125,422		N.A.	N.A.				1,159						205	126,786
1997	51,790		N.A.	N.A.				3,332						755	55,877
1998	263,820		N.A.	N.A.	2,726	4,904		15,783						1,876	289,109
1999	46,955	184	N.A.	N.A.	283		791	8,902		174				588	57,877

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.

Source: PacFIN, extracted February 2001.

Table A-42. Landings (round mt) of the drift gillnet fishery in California, 1981-99.

Year	Sword-fish	Sharks					Tunas		Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin							
1981	270	808			91	9		2		6	7			92	1,285
1982	208	634		13	125	1	5	2		5	2			22	1,017
1983	242	150		17	38		6	7		< 0.5	7	< 0.5		24	491
1984	286	95		2	11		10	4		5	< 0.5			13	426
1985	197	108		2	15		7	< 0.5		1	< 0.5			14	344
1986	78	32		2	21		8	2		< 0.5	< 0.5			10	153
1987	6	3	< 0.5	1	2		1	< 0.5			< 0.5			1	14
1988	1	< 0.5					< 0.5							< 0.5	1
1989		< 0.5												< 0.5	< 0.5
1990															
1991	51	8		4	2		< 0.5	< 0.5						2	67
1992	60	2		< 0.5	5		1	1			< 0.5			3	72
1993	162	16	< 0.5	7	11		15	7		< 0.5				10	228
1994	760	268	< 0.5	32	70	< 0.5	52	25	< 0.5	4	2			115	1,328
1995	682	200	5	29	73	< 0.5	31	29	< 0.5	2	1	< 0.5		92	1,144
1996	708	240	1	19	79	< 0.5	63	40		1	6	< 0.5		133	1,290
1997	646	249	34	27	113	< 0.5	42	57	< 0.5	1	4			107	1,280
1998	845	249	2	9	77		61	40	< 0.5	2	2	< 0.5		145	1,432
1999	573	150	2	4	45	< 0.5	92	18		1	< 0.5	< 0.5		105	990

Source: PacFIN, extracted February 2001.

Note: Significant swordfish and shark landings by drift gillnet gear prior to 1994 may have been mis-assigned to California unknown or entangling net gear, and therefore are not reported here.

Table A-43. Real exvessel revenues (1999)¹ from drift gillnet fishery landings in California, 1981-99.

Year	Swordfish	Sharks					Tunas		Dorado	Groundfish	Coastal Pelagics	Crab	Salmon	Other	Total
		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin							
1981	1,934,458	1,334,893			136,834	8,902		8,384		11,446	7,698			264,064	3,706,679
1982	1,639,245	1,106,777		11,206	190,823	1,070	12,014	7,717		9,539	1,481			53,798	3,033,670
1983	1,497,438	262,413		40,296	59,287		17,472	16,637		1,122	8,925	16		43,689	1,947,295
1984	1,661,125	218,727		3,677	20,659		23,089	8,921		12,740	444			14,567	1,963,949
1985	1,162,226	262,222		3,597	27,911		10,835	998		1,686	185			18,288	1,487,948
1986	538,142	88,345		3,933	42,288		12,550	6,819		444	93			13,070	705,684
1987	51,470	7,530	144	2,284	4,869		2,209	102			169			2,288	71,065
1988	4,440	349					142							81	5,012
1989		1,078												< 0.5	1,078
1990															
1991	427,285	14,052		2,184	3,826		1,005	932						1,329	450,613
1992	277,305	3,161		86	8,906		1,242	2,911			357			4,054	298,022
1993	1,029,090	28,108	132	5,850	23,883		26,804	25,041		1,141				13,575	1,153,624
1994	4,957,559	535,035	46	29,782	140,048	7	100,540	134,833	43	6,052	923			180,353	6,085,221
1995	4,344,700	369,273	9,286	24,519	137,258	112	53,383	88,993	14	2,098	541	16		147,927	5,178,120
1996	3,979,139	469,856	1,635	16,962	144,655	41	111,483	126,841		1,138	2,685	517		216,286	5,071,238
1997	3,155,767	450,991	63,719	25,745	196,036	6	69,778	261,971	509	2,337	3,614			146,538	4,377,011
1998	3,732,785	435,664	2,487	7,895	133,571		75,909	190,055	2,505	3,477	1,795	89		201,544	4,787,776
1999	2,670,385	273,976	2,553	3,781	79,363	19	99,944	86,620		1,108	128	715		189,486	3,408,078

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.

Source: PacFIN, extracted February 2001.

Note: Significant swordfish and shark landings by drift gillnet gear prior to 1994 may have been mis-assigned to California unknown or entangling net gear, and therefore corresponding exvessel revenues are not reported here.

Table A-44. Landings (round mt) in the Pacific coast drift gillnet fishery, 1981-99.

Year	Sword-fish	Sharks					Tunas		Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin							
1981	270	808			91	9		2		6	7			92	1,285
1982	208	634		13	125	1	5	2		5	2			22	1,017
1983	242	150		17	38		6	7		< 0.5	7	< 0.5		24	491
1984	286	95		2	11		10	4		5	< 0.5			13	426
1985	197	110		2	15		7	< 0.5		1	< 0.5			13	345
1986	78	455		2	21		8	2		< 0.5	< 0.5			10	576
1987	6	94	< 0.5	1	2		1	< 0.5		2	< 0.5			3	109
1988	1	81					4			< 0.5				< 0.5	86
1989		< 0.5												< 0.5	< 0.5
1990															
1991	51	8		4	2		< 0.5	< 0.5						2	67
1992	60	2		< 0.5	5		1	1			< 0.5			3	72
1993	162	16	< 0.5	7	11		15	7		< 0.5				10	228
1994	760	268	< 0.5	32	70	< 0.5	52	25	< 0.5	4	2			115	1,328
1995	684	200	5	29	73	< 0.5	31	29	< 0.5	2	1	< 0.5		93	1,147
1996	724	240	1	19	79	< 0.5	63	41		1	6	< 0.5		132	1,306
1997	652	249	34	27	113	< 0.5	42	57	< 0.5	1	4			108	1,287
1998	880	249	2	9	78	1	61	43	< 0.5	2	2	< 0.5		146	1,473
1999	578	151	2	4	45	< 0.5	93	19		1	< 0.5	< 0.5		105	998

Source: PacFIN, extracted February 2001.

Note: Significant swordfish and shark landings by drift gillnet gear prior to 1994 may have been mis-assigned to California unknown or entangling net gear, and therefore are not reported here.

Table A-45. Real exvessel revenues (1999)¹ for the Pacific coast drift gillnet fishery, 1981-99.

Year	Sword-fish	Sharks					Tunas		Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin							
1981	1,934,458	1,334,893			136,834	8,902		8,384		11,446	7,698			264,064	3,706,679
1982	1,639,245	1,106,777		11,206	190,823	1,070	12,014	7,717		9,539	1,481			53,798	3,033,670
1983	1,497,438	262,413		40,296	59,287		17,472	16,637		1,122	8,925	16		43,689	1,947,295
1984	1,661,125	218,727		3,677	20,659		23,089	8,921		12,740	444			14,567	1,963,949
1985	1,162,226	265,286		3,597	27,911		10,835	998		1,686	185			18,288	1,491,012
1986	538,142	961,328		3,933	42,288		12,550	6,819		444	93			15,080	1,580,677
1987	51,470	222,213	144	2,284	4,869		2,368	111		6,176	169			7,234	297,038
1988	4,440	180,243					9,473			616				189	194,961
1989		1,078												< 0.5	1,078
1990															
1991	427,285	14,052		2,184	3,826		1,005	932						1,329	450,613
1992	277,305	3,161		86	8,906		1,242	2,911			357			4,054	298,022
1993	1,029,090	28,108	132	5,850	23,883		26,804	25,041		1,141				13,575	1,153,624
1994	4,957,559	535,035	46	29,782	140,048	7	100,540	134,833	43	6,052	923			180,353	6,085,221
1995	4,369,842	369,734	9,286	24,519	137,258	112	53,383	89,446	14	2,098	541	16		147,926	5,204,175
1996	4,104,561	469,856	1,635	16,962	144,655	41	111,483	128,001		1,138	2,685	517		216,490	5,198,024
1997	3,207,557	450,991	63,719	25,745	196,036	6	69,778	265,304	509	2,337	3,614			147,292	4,432,888
1998	3,996,605	435,664	2,487	7,895	136,296	4,904	75,909	205,838	2,505	3,477	1,795	89		203,422	5,076,886
1999	2,717,340	274,160	2,553	3,781	79,646	19	100,734	95,522		1,282	128	715		190,075	3,465,955

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.

Source: PacFIN, extracted February 2001.

Note: Significant swordfish and shark landings by drift gillnet gear prior to 1994 may have been mis-assigned to California unknown or entangling net gear, and therefore corresponding exvessel revenues are not reported here.

Table A-46. Landings (round mt) in the Pacific coast harpoon fishery, 1981-99.

Year	Swordfish	HMS Sharks	Tunas		Dorado	Other	Total
			Albacore	Tropical & Bluefin			
1981	265	5	2	< 0.5		5	277
1982	156	2		< 0.5		< 0.5	158
1983	58	1				43	102
1984	95	7	< 0.5	< 0.5		1	103
1985	210	1	< 0.5			1	212
1986	236	1	< 0.5			< 0.5	237
1987	211	3	1	< 0.5		40	255
1988	179	3	1			1	184
1989	54	1	< 0.5			< 0.5	55
1990	51	2				< 0.5	53
1991	16	1				< 0.5	17
1992	74	3	< 0.5			1	78
1993	168	1	1			1	171
1994	153	1	< 0.5			1	155
1995	96	2				< 0.5	98
1996	81	1	< 0.5			1	83
1997	84	3	< 0.5		< 0.5	< 0.5	87
1998	48	1				< 0.5	49
1999	80	< 0.5				2	82

Source: PacFIN, extracted February 2001.

Note: 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.

Table A-47. Real exvessel revenues (1999)¹ for the Pacific coast harpoon fishery, 1981-99.

Year	Swordfish	HMS Sharks	Tunas		Dorado	Other	Total
			Albacore	Tropical & Bluefin			
1981	2,336,486	8,668	6,885	397		21,230	2,373,666
1982	1,374,979	3,258		240		1,486	1,379,963
1983	493,186	3,084				15,623	511,893
1984	789,510	12,743	500	227		3,069	806,049
1985	1,363,656	2,143	330			2,338	1,368,467
1986	2,046,538	2,533	76			1,798	2,050,945
1987	2,011,286	6,619	5,747	260		116,820	2,140,732
1988	1,772,924	8,007	11,424			1,177	1,793,532
1989	554,052	1,424	2,700			172	558,348
1990	512,331	4,825				1,129	518,285
1991	174,931	1,963				143	177,037
1992	667,541	6,586	1,422			1,688	677,237
1993	1,262,329	2,118	8,661			1,121	1,274,229
1994	1,360,282	1,765	2,725			2,956	1,367,728
1995	804,638	4,363				1,879	810,880
1996	664,678	3,378	227			873	669,156
1997	704,930	5,739	206		93	695	711,663
1998	406,737	1,634				781	409,152
1999	602,195	811				5,850	608,856

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.

Note: 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.

Source: PacFIN, extracted February 2001.

Table A-48. Landings (mt) by California-Based Longline Vessels Fishing Beyond the U.S. EEZ

Species\Year	1991	1992	1993	1994
Swordfish	27.5	28.8	101.3	496.7
Bigeye Tuna	4	4.7	27	31.5
Albacore	0.5	<0.1	2.6	20.3
Bluefin Tuna	0.1	0.5	3.5	5.1
Yellowfin Tuna	0.1	0	6.3	4
Unspecified Tuna	0.3	0.4	0.8	4.3
Mako Shark	0.9	3.6	6.3	13.3
Thresher Shark	0.1	0.6	1.4	12.8
Blue Shark	0	0	0	7.5
Unspecified Shark	0	0	0.7	1.4
Dorado	<0.1	0.7	16.1	27.6
Opah	0.8	0.5	3.9	7.3
Escolar	0.4	0.4	1.7	4.3
Total	34.7	40.2	171.6	636.1

Table A-49. Percentage Species Composition (by Weight) of Landings by California-Based Longline Vessels Fishing Beyond the U.S. EEZ

Species\Year	1991	1992	1993	1994
Swordfish	79	72	59	78
Bigeye Tuna	12	12	16	5
Albacore	1	<1	2	1
Bluefin Tuna	<1	1	2	1
Yellowfin Tuna	<1	0	4	1
Unspecified Tuna	1	1	<1	1
Mako Shark	3	9	4	2
Thresher Shark	<1	2	1	2
Blue Shark	0	0	0	1
Unspecified Shark	0	0	<1	<1
Dorado	<1	2	9	4
Opah	2	1	2	1
Escolar	1	1	1	1

Note: Percentages may not equal 100% due to rounding

Table A-50. Landings (round mt) in the Pacific coast pelagic longline fishery, 1981-99.

Year	Sword-fish	Sharks					Tunas		Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin							
1981	< 0.5				19	72	25	1		2	< 0.5			1	120
1982	< 0.5	1			6	18	42	1	< 0.5	< 0.5	< 0.5			2	70
1983	< 0.5	< 0.5			1	2	6	2	< 0.5	< 0.5	< 0.5			8	19
1984	12	3		< 0.5	2		2	2	3	2	< 0.5			4	30
1985	< 0.5	1			< 0.5		< 0.5			< 0.5				1	2
1986		2			1					< 0.5	< 0.5			3	6
1987		< 0.5			3		< 0.5							3	6
1988	< 0.5	1			152	1		< 0.5		4	< 0.5			6	164
1989					5	1				< 0.5				< 0.5	5
1990		< 0.5			15	4	< 0.5			< 0.5	< 0.5			1	20
1991	27	< 0.5			23	< 0.5	< 0.5	2	< 0.5	3				1	56
1992	63	2		< 0.5	2	< 0.5	1	< 0.5		21	< 0.5			2	91
1993	27	< 0.5			1	< 0.5	< 0.5	5	1	1	1			2	38
1994	721	18		3	19	12	49	51	32	4	< 0.5			20	929
1995	271	11		1	7	5	4	58	5	8	2			4	376
1996	346	2			5	< 0.5	3	66	9	5	< 0.5			7	443
1997	664	4		2	3	< 0.5	6	81	1	30	< 0.5			4	795
1998	411	3			4	< 0.5	8	87	1	8	1			13	536
1999	1,287	5			5		66	132	15	1				13	1524

Source: PacFIN, extracted February 2001.

Table A-51. Landings (round mt) of the pelagic longline fishery in Oregon, 1981-99.

Year	Sword-fish	Sharks					Tunas		Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin							
1981			N.A.	N.A.											
1982			N.A.	N.A.											
1983			N.A.	N.A.											
1984			N.A.	N.A.											
1985			N.A.	N.A.											
1986			N.A.	N.A.											
1987		< 0.5	N.A.	N.A.			< 0.5							2	2
1988			N.A.	N.A.											
1989			N.A.	N.A.											
1990			N.A.	N.A.											
1991			N.A.	N.A.											
1992			N.A.	N.A.											
1993			N.A.	N.A.											
1994			N.A.	N.A.											
1995			N.A.	N.A.											
1996			N.A.	N.A.											
1997			N.A.	N.A.											
1998			N.A.	N.A.											
1999			N.A.	N.A.											

Source: PacFIN, extracted February 2001.

Table A-52. Landings (round mt) of the pelagic longline fishery in California, 1981-99.

Year	Sword-fish	Sharks					Tunas		Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin							
1981	< 0.5				19	72	25	1		2	< 0.5			1	120
1982	< 0.5	1			6	18	42	1	< 0.5	< 0.5	< 0.5			2	70
1983	< 0.5	< 0.5			1	2	6	2	< 0.5	< 0.5	< 0.5			8	19
1984	12	3		< 0.5	2		2	2	3	2	< 0.5			4	30
1985	< 0.5	1			< 0.5		< 0.5			< 0.5				1	2
1986		2			1					< 0.5	< 0.5			3	6
1987					3									< 0.5	3
1988	< 0.5	1			152	1		< 0.5		4	< 0.5			6	164
1989					5	1				< 0.5				< 0.5	5
1990		< 0.5			15	4	< 0.5			< 0.5	< 0.5			1	20
1991	27	< 0.5			23	< 0.5	< 0.5	2	< 0.5	3				1	56
1992	63	2		< 0.5	2	< 0.5	1	< 0.5		21	< 0.5			2	91
1993	27	< 0.5			1	< 0.5	< 0.5	5	1	1	1			2	38
1994	721	18		3	19	12	49	51	32	4	< 0.5			20	929
1995	271	11		1	7	5	4	58	5	8	2			4	376
1996	346	2			5	< 0.5	3	66	9	5	< 0.5			7	443
1997	664	4		2	3	< 0.5	6	81	1	30	< 0.5			4	795
1998	411	3			4	< 0.5	8	87	1	8	1			13	536
1999	1,287	5			5		66	132	15	1				13	1,524

Source: PacFIN, extracted February 2001.

Table A-53. Real exvessel revenues (1999)¹ for the Pacific coast pelagic longline fishery, 1981-99.

	Sharks						Tunas								
Year	Sword-fish	Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin	Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
1981	2,689				29,400	82,990	83,989	2,213		4,493	199			2,010	207,983
1982	502	2,331			8,919	19,803	120,325	3,207	514	39	34			381	156,055
1983	795	69			1,380	683	18,814	10,457	20	321	56			4,532	37,127
1984	95,137	6,028		507	5,037		4,289	10,758	4,079	2,810	4			8,660	137,309
1985	1,101	2,815			36		1,084			65				240	5,341
1986		5,485			2,332					345	48			11,294	19,504
1987		254			9,623		227							1,541	11,645
1988	2,139	3,101			430,037	707		528		2,617	33			7,399	446,561
1989					14,987	571				38				< 0.5	15,596
1990		657			38,280	2,862	55			239	6			5,177	47,276
1991	172,894	235			52,861	367	623	16,807	43	4,588				4,251	252,669
1992	343,699	3,797		420	3,850	187	2,059	5,985		33,887	3			3,173	397,060
1993	169,904	71			1,513	22	611	41,548	2,170	4,605	1,066			3,353	224,863
1994	3,713,003	14,469		3,866	34,470	17,304	88,176	350,547	63,185	12,969	131			41,114	4,339,234
1995	1,138,647	18,623		385	7,151	2,480	5,724	332,905	5,739	18,307	7,726			7,729	1,545,416
1996	1,385,861	4,467			6,667	2	3,887	300,010	9,531	11,300	92			32,277	1,754,094
1997	2,183,751	8,464		7,568	4,115	6	10,744	363,665	2,751	110,888	144			16,940	2,709,036
1998	1,460,268	5,390			9,542	51	20,916	493,564	4,003	23,826	1,030			55,302	2,073,892
1999	4,738,191	6,530			7,759		133,460	928,412	36,781	2,304				61,804	5,915,241

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.

Source: PacFIN, extracted February 2001.

Table A-54. Real exvessel revenues (1999)¹ from pelagic longline fishery landings in Oregon, 1981-99.

Year	Sword-fish	Sharks					Tunas		Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin							
1981			N.A.	N.A.											
1982			N.A.	N.A.											
1983			N.A.	N.A.											
1984			N.A.	N.A.											
1985			N.A.	N.A.											
1986			N.A.	N.A.											
1987		254	N.A.	N.A.			227							1,541	2,022
1988			N.A.	N.A.											
1989			N.A.	N.A.											
1990			N.A.	N.A.											
1991			N.A.	N.A.											
1992			N.A.	N.A.											
1993			N.A.	N.A.											
1994			N.A.	N.A.											
1995			N.A.	N.A.											
1996			N.A.	N.A.											
1997			N.A.	N.A.											
1998			N.A.	N.A.											
1999			N.A.	N.A.											

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.

Source: PacFIN, extracted February 2001.

Table A-55. Real exvessel revenues (1999)¹ from pelagic longline fishery landings in California, 1981-99.

Year	Sword-fish	Sharks					Tunas		Dorado	Ground-fish	Coastal Pelagics	Crab	Salmon	Other	Total
		Common Thresher	Pelagic Thresher	Bigeye Thresher	Shortfin Mako	Blue	Albacore	Tropical & Bluefin							
1981	2,689				29,400	82,990	83,989	2,213		4,493	199			2,010	207,983
1982	502	2,331			8,919	19,803	120,325	3,207	514	39	34			381	156,055
1983	795	69			1,380	683	18,814	10,457	20	321	56			4,532	37,127
1984	95,137	6,028		507	5,037		4,289	10,758	4,079	2,810	4			8,660	137,309
1985	1,101	2,815			36		1,084			65				240	5,341
1986		5,485			2,332					345	48			11,294	19,504
1987					9,623									< 0.5	9,623
1988	2,139	3,101			430,037	707		528		2,617	33			7,399	446,561
1989					14,987	571				38				< 0.5	15,596
1990		657			38,280	2,862	55			239	6			5,177	47,276
1991	172,894	235			52,861	367	623	16,807	43	4,588				4,251	252,669
1992	343,699	3,797		420	3,850	187	2,059	5,985		33,887	3			3,173	397,060
1993	169,904	71			1,513	22	611	41,548	2,170	4,605	1,066			3,353	224,863
1994	3,713,003	14,469		3,866	34,470	17,304	88,176	350,547	63,185	12,969	131			41,114	4,339,234
1995	1,138,647	18,623		385	7,151	2,480	5,724	332,905	5,739	18,307	7,726			7,729	1,545,416
1996	1,385,861	4,467			6,667	2	3,887	300,010	9,531	11,300	92			32,277	1,754,094
1997	2,183,751	8,464		7,568	4,115	6	10,744	363,665	2,751	110,888	144			16,940	2,709,036
1998	1,460,268	5,390			9,542	51	20,916	493,564	4,003	23,826	1,030			55,302	2,073,892
1999	4,738,191	6,530			7,759		133,460	928,412	36,781	2,304				61,804	5,915,241

¹Real values are current values adjusted to eliminate the effects of inflation by dividing current values by the current year GDP implicit price deflator, with a base year of 1999.

Source: PacFIN, extracted February 2001.

Table A-56. Reported catch in number of fish from california gillnet logbooks (drift only) for 2000 and 2001.

2001

Vessel	Days Fished (Sets)	Mesh Size - Inches	Albacore	Bluefin Tuna	Yellowfin Tuna	Mako Shark	Thresher Shark	Yellowtail	Pomfret	Louvar	Average Soak Time (Hours)	Areas Fished
1	8	6.75	97	243	109	60	1	100	0	0	9.4	Cortez Bank, 10-40 miles off San Diego
2	15	7.00	353	212	0	2	0	0	479	1	12.0	Morro Bay to Point Arguello 10 to 20 miles offshore
3	8	6.50	405	30	0	3	0	0	500	7	7.8	Morro Bay to San Miguel Isl. 20 to 50 miles offshore
4	9	6.00	406	78	0	33	1	0	200	0	10.3	Cortez Bank, 50 miles offshore from Point Arguello

2000

Vessel	Days Fished (Sets)	Mesh Size - Inches	Albacore	Bluefin Tuna	Yellowfin Tuna	Mako Shark	Thresher Shark	Yellowtail	Pomfret	Louvar	Average Soak Time (Hours)	Areas Fished
2	5	7.00	100	0	0	2	2	9	0	1	9.4	20 to 90 miles off San Diego
3	4	6.50	28	20	0	0	0	0	0	5	8.0	20 miles off San Miguel Island

Table A-57. Imports of Swordfish Into The United States, 1975-1996 (kg)

Year	Imports (kg)
1975	11,558
1976	32,450
1977	79,753
1978	161,398
1979	157,427
1980	216,631
1981	580,668
1982	549,615
1983	648,787
1984	1,240,396
1985	4,114,675
1986	5,428,595
1987	4,066,840
1988	4,006,982
1989	6,813,093
1990	7,475,609
1991	7,170,861
1992	6,882,581
1993	5,838,149
1994	4,379,120
1995	4,681,267
1996	5,139,596

Source: U.S. Bureau of the Census (via World Swordfish Fisheries, Vol. V, U.S. Dept. of Commerce, 1997)

Table A-58. California CPFV HMS catches (no. of fish) for the years 1980 to 1998.

California	Yellowfin	Skipjack	Bluefin	Albacore	Bigeye	Swordfish	Marlin	Mako	Thresher	Blue Shark	Dorado
1980	8	0	542	5,652	0	1	3	8	14	1,826	2
1981	81	17	419	1,946	25	0	37	34	7		35
1982	129	8	392	7,352	9	0	13	18	36	625	0
1983	37,816	48,254	443	7,833	176	0	28	28	136		1,258
1984	421	3,993	1,765	15,527	26	2	9	49	16	454	527
1985	43	40	850	13,309	10	0	7	18	29		5
1986	0	0	443	14,706	37	0	13	58	13		11
1987	1	167	5	3,580	7	0	8	296	15	364	0
1988	9	2	147	547	2	2	2	115	15	1,914	1
1989	17	165	88	367	2	0	7	302	45		1
1990	216	1,008	198	275	5	0	7	231	51		7,147
1991	60	18	0	741	0	0	1	129	50		0
1992	15,457	26,326	3,325	379	7	0	12	130	29		1,912
1993	73	4,743	316	393	0	3	1	297	163		707
1994	2,285	1,797	10	171	0	0	5	270	30		64
1995	13,096	24,436	93	1,341	1	0	6	147	59		12
1996	2,926	961	89	1,805	0	0	4	234	30		341
1997	21,069	9,504	1,397	31,985	28	0	13	115	46		5,730
1998	6,588	3,145	2,430	54,487	26	0	6	148	27	163	394
Mexico											
1980	11,229	3,891	187	15,657	8		55				8,843
1981	4,478	418	123	24,702	217	1	30	3			1,246
1982	1,906	24	273	29,338	129		20	8			1,099
1983	78,482	54,786	1,469	9,328	2,077		37	1			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			1,357
1986	5,505	2,249	250	12,616	1,478		30	8			1,855
1987	14,796	8,038	1,946	3,466	628		160	8			3,518
1988	20,056	1,896	183	12	426		132	17			3,348
1989	19,059	19,571	6,431	29,361	42		33	8	1		2,340
1990	49,524	15,523	3,558	3,568	2,191		101	12			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		10,815

Table A-58. California CPFV HMS catches (no. of fish) for the years 1980 to 1998, continued.

1993	37,069	19,080	10,219	0	46		29	11			8,245
1994	44,546	13,530	2,299	0	15		37	17			5,254
1995	80,524	20,435	15,337	1	37	1	32	33			5,063
1996	76,365	5,882	2,660	390	126		13	55	1		24,494
1997	72,666	10,821	6,907	59,136	241		12	19	2		24,204
1998	70,166	10,699	17,321	105,219	1,771	3	10	28			6,164
% IN MEX	0.87	0.66	0.87	0.80	0.97	0.38	0.86	0.09	0.01		0.89

Source: California Department of Fish and Game, CPFV logbooks.

Table A-59. Estimated west coast HMS recreational catches (1,000's of fish) and effort (1,000's of angler trips), 1981-98.

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Albacore																		
CPFV	2	39	18	104	73	39			0							2	3	73
Private Boats	2	8	6	123	58	27	2	1	5					3	5	1	88	98
Bigeye Tuna																		
CPFV			1															
Private Boats		3	1	1														
Bluefin Tuna																		
CPFV			3	12	1	0							7				0	2
Private Boats			1	1														2
Skipjack Tuna																		
CPFV			104	9		1							22				1	12
Private Boats			65	4			0		5				16	7	45	1	4	4
Yellowfin Tuna																		
CPFV			106										11					83
Private Boats			53	0					7				7	2	24	3	9	15
Dorado																		
CPFV			2	4									7					3
Private Boats			5	5									6	1	0	3	20	13
Shortfin Mako Shark																		
CPFV			0	0														
Private Boats	13	1	1	3	9	5	22	10	6				4	11	5	2	5	1
Thresher Shark																		
CPFV					0													
Private Boats		2	2	1	0	1	5		1				3	2	3	1	0	0
Striped Marlin																		
CPFV																		
Private Boats		1	0	1	1		1	1					0	0	0		0	
Effort (1000's of Angler Trips)																		
CPFV	1422	2252	1629	1348	1377	1537	1073	833	1350				1174	1201	1131	1080	966	698
Private Boats	2765	2544	2893	3198	2989	3798	3692	1925	2481				2681	2939	2780	1935	1919	1455
Total Boat Effort	4298	4898	4860	4787	4547	5463	4924	2890	3966				4017	4284	4167	3130	3130	2405

Source: Marine Recreational Fisheries Statistics Survey, NMFS.

Table A-60. Estimated HMS recreational catches (1,000's of fish) by CPFVs and private boats from S. California waters, 1981-98.

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Albacore																		
CPFV	1.7	39.1	18.2	94.7	48.2	36.1												50.1
Private Boats	1.7	7.3	5.4	123.0	33.5	21.0	.9		4.7								7.4	23.6
Bigeye Tuna																		
CPFV			.7															
Private Boats		2.5	.6	.6														
Bluefin Tuna																		
CPFV			3.1	11.6	.7	.2							6.5					2.0
Private Boats			.6	.6														1.4
Skipjack Tuna																		
CPFV			104.1	9.3									21.9				.6	12.7
Private Boats			65.0	4.4			.5		5.0				15.6	6.5	45.1	1.0	4.3	1.5
Yellowfin Tuna																		
CPFV			106.5										11.4					43.0
Private Boats			51.3	.3					7.0				6.9	1.6	23.7	3.2	9.2	6.7
Dorado																		
CPFV																		
Private Boats																		
Shortfin Mako Shark																		
CPFV		.4	.4															
Private Boats	13.0	1.5	1.1	2.6	9.3	4.8	21.6	10.0	5.8				3.6	11.4	5.3	1.9	4.8	1.7
Thresher Shark																		
CPFV																		
Private Boats		2.2	2.4	.3		1.4	4.5		.8				1.5	1.3	2.7	.7	.5	.6
Striped Marlin																		
CPFV																		
Private Boats		.8	.4	1.2	.7		.9	.8					.3	.4	.3		.4	

Source: RecFIN

Table A-61. West coast CPFV albacore catch, 1971 - 1984.

Year	California		Oregon		Washington		Total Catch	
	No. Fish	MT	No. Fish	MT	No. Fish	MT	No. Fish	MT
1971	160,361	1,175	-				160,361	1,175
1972	86,890	637	*				86,890	637
1973	9,858	72	*		1,648	12	11,506	84
1974	12,814	94	*				12,814	94
1975	81,562	595	*		5,494	45	87,056	640
1976	84,973	620	*		9,566	93	94,529	713
1977	70,274	513	*		4,275	24	74,549	537
1978	92,646	676	*		20,137	134	112,783	810
1979	10,196	74	*				10,196	74
1980	21,309	156	*		1,540	12	22,849	168
1981	26,648	195	*				26,648	195
1982	36,690	268	35	0	18	0	36,743	268
1983	17,161	125	0	0	0	0	17,161	125
1984	181,836	1,278	3	0	0	0	181,839	1,278

Source: Holts 1985.

Table A-62. Total Economic Impact of San Diego Bay Sportfish Businesses

Economic Activity	Direct Impact	Total Impact	Percent of Total
Employment	544	1200	45%
Employment Earnings	7,715,878	25,326,802	30%
Business Output	30,752,613	48,950,394	63%

Source: London Group (1999)

Note: Pertains to San Diego Bay and excludes the rest of San Diego County. Direct impacts are related to employment, income and economic activity within the sportfishing industry; total impacts include the direct, indirect (impacts on industries that provide goods and services to the sportfishing industry) and induced (impacts due to the expenditures from household income generated by the direct and indirect industries associated with sportfishing)

Table A-63. Summary of all fish tagged in 2000 with releases and recoveries for 1963-2000

Species Name	Releases 2000	Releases Total	Recoveries Total	Rate%
Striped Marlin	249	20503	327	1.59
Sailfish	128	7749	45	0.58
Blue Marlin, Pacific	148	5315	58	1.09
Billfish, unid.	14	4293	5	0.12
Black Marlin	5	3339	69	2.07
Shortfin Mako Shark	47	1165	27	2.32
Roosterfish		920	29	3.15
Short-billed Spearfish	85	967	1	0.10
Broadbill Swordfish	8	504	15	2.98
Yellowtail		492	36	7.32
Dorado		407	3	0.74
Yellowfin Tuna	3	345	25	7.25
Blue Shark		316	5	1.58
Skipjack Tuna		97	2	2.06
Thresher Shark	30	127	13	10.24
Bat Ray		84	0	0.00
Albacore Tuna	6	85	0	0.00
Bigeye Tuna	1	79	2	2.53
Hammerhead Shark		52	2	3.85
Bluefin Tuna		50	5	10.00
White Sturgeon		50	1	2.00
Black Sea Bass		40	8	20.00
Blue Marlin, Atlantic	2	42	0	0.00
Leopard Shark		39	1	2.56
Whitetip Shark		39	1	2.56
Wahoo		38	3	7.89
Bronze Whaler Shark	13	50	1	2.00
Jack Crevalle		32	0	0.00
Blue Crevalle		30	1	3.33
Shark, unid.		26	0	0.00
Barracuda	1	24	2	8.33
Tiger Shark		17	2	11.76
White Marlin	1	13	1	7.69
Whale Shark		4	1	25.00
All Others	2	278	10	3.60
TOTALS	743	47611	701	1.47

Source: Billfish Tagging Program, SWFSC.

Table A-64. Number of vessels with Pacific coast HMS commercial landings by species, 1981-99.

	Tunas						Sharks						Any HMS
							Common	Pelagic	Bigeye	Shortfin			
Year	Albacore	Yellowfin	Skipjack	Bigeye	Bluefin	Swordfish	Thresher	Thresher	Thresher	Mako	Blue	Dorado	
1981	1,869	274	140	90	37	267	251			208	69	9	2354
1982	824	214	122	53	52	271	329		35	262	70	6	1,378
1983	1,732	376	362	113	64	255	418	19	105	272	37	15	2,258
1984	1,247	278	253	65	105	299	397	24	109	337	23	18	1,612
1985	898	197	22	56	109	298	389	5	135	301	26	6	1,314
1986	530	112	29	74	97	301	360	**	118	286	21	**	980
1987	563	98	41	61	57	277	333	15	76	360	23	**	1,045
1988	604	90	43	38	70	228	316	4	42	278	26	4	1,027
1989	382	57	65	11	83	194	291	**	61	250	18	8	780
1990	413	63	50	23	98	187	271	10	73	260	22	22	811
1991	223	39	41	33	54	152	247		59	208	17	5	517
1992	634	66	52	12	81	168	234	3	53	244	22	17	999
1993	644	47	41	13	108	166	231	3	72	209	25	22	966
1994	756	68	40	27	96	201	206	**	80	226	12	26	1,048
1995	525	85	86	27	99	174	188	5	70	184	17	16	790
1996	758	77	57	18	110	152	174	6	40	173	22	18	985
1997	1,224	106	60	29	115	153	174	36	52	173	25	49	1,452
1998	921	112	63	34	135	146	154	10	34	166	31	30	1,116
1999	864	38	26	39	105	141	164	10	22	128	11	29	1,025

Source: PacFIN, extracted February 2001.

**Fewer than three vessels in this category.

Table A-65. Number of vessels with Pacific coast HMS commercial landings by gear type and species, 1981-99.

	Species							
	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Any HMS	Non-HMS
Year	Gear Type - Surface Hook-and-Line							
1981	1,828	4	6	98	3	225	1,932	2,871
1982	757	8	3	141	8	112	909	2,815
1983	802	9	8	61	5	228	972	2,587
1984	878	16	10	61	8	175	933	1,899
1985	675	18	3	102	21	89	771	2,231
1986	356	11	**	82	10	52	458	2,301
1987	431	9		153	12	40	596	2,270
1988	502	11	**	120	10	35	646	2,290
1989	324	14	**	119	13	37	470	2,313
1990	365	18	13	113	11	41	503	2,159
1991	170		3	96	11	17	271	1,957
1992	605	9	12	137	19	38	757	1,561
1993	609	21	17	128	19	29	753	1,575
1994	715	10	**	87	14	31	825	1,248
1995	473	11	**	77	10	55	577	1,359
1996	728	14	9	62	6	32	803	1,305
1997	1,196	28	32	64	7	60	1,264	1,241
1998	868	43	18	56	8	72	926	1,122
1999	828	29	12	44	6	26	863	1,062
Year	Gear Type - Drift Gillnet							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Any HMS	Non-HMS
1981		5		126	94	33	130	108
1982	28	3		124	93	31	130	76
1983	34	5		116	98	51	121	92
1984	47	5		94	80	26	104	71
1985	35	3		78	74	4	96	59
1986	9	7		31	25	7	36	57
1987	3	**		14	15		18	26
1988	3			**	**		3	7
1989				**			**	
1990								**
1991	6	**		12	10	3	14	9
1992	**	6		16	17	5	19	15
1993	27	30		65	70	7	76	58
1994	44	59	**	136	137	28	151	136
1995	64	65	**	121	114	56	136	119
1996	64	71		124	109	30	135	120
1997	50	62	8	116	106	36	121	120
1998	69	63	4	109	97	38	111	116
1999	63	55	**	94	86	18	104	98

Table A-65. Number of vessels with Pacific coast HMS commercial landings by gear type and species, 1981-99, continued.

Gear Type - Pelagic Longline								
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Any HMS	Non-HMS
1981	12			12	**	**	27	200
1982	13		**	14	**	3	28	238
1983	8		**	9	**	3	19	114
1984	7	3	**	7	7	4	14	56
1985	**			4	**		6	29
1986				4			4	10
1987				3			3	6
1988		**		12	**		12	17
1989				4			4	14
1990	**			4		**	5	55
1991	**	**	**	10	3	**	11	147
1992	5	**		13	8	**	19	195
1993	**	**	4	7	6	5	11	122
1994	23	17	22	35	32	28	43	201
1995	12	10	13	31	24	20	35	266
1996	10	13	9	14	19	19	27	344
1997	17	8	6	19	24	28	50	326
1998	24	18	11	29	33	37	69	262
1999	27	26	14	12	37	37	52	242
Gear Type - Purse Seine								
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Any HMS	Non-HMS
1981	29	26	**	5	**	128	137	145
1982	22	34		7	**	115	127	76
1983	8	27		6	3	105	112	110
1984	37	17		6	3	70	78	91
1985	6	28		5	8	31	55	66
1986	15	28	**	13	13	40	54	68
1987	3	15		4	3	37	47	77
1988	5	22		**	**	36	45	77
1989	**	23	**	6	5	26	41	96
1990	7	21		**		22	31	76
1991		6		**	**	15	19	70
1992	**	17	**	8	5	24	31	70
1993	4	18	**	8	5	22	30	77
1994		13	**	4		24	29	77
1995		12		**		22	23	95
1996	**	17		3		23	24	98
1997	6	20	**	3	**	31	35	93
1998	15	19		**	**	28	35	64
1999	4	4		**		12	16	97

Table A-65. Number of vessels with Pacific coast HMS commercial landings by gear type and species, 1981-99, continued.

Gear Type - Harpoon								
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Any HMS	Non-HMS
1981	**			17	187	5	187	22
1982				14	158	**	159	6
1983				5	88		88	16
1984	4			20	107	**	111	12
1985	**			11	96		98	9
1986	**			20	112		113	7
1987	3	**		23	97		97	8
1988	**			21	82		82	7
1989	**			5	44		44	**
1990				18	49	**	50	3
1991				12	32		32	**
1992	**			18	47	**	47	4
1993	**			12	42		42	3
1994	**			8	49		50	5
1995				14	39		39	4
1996	**			12	30		31	3
1997	**		**	18	31		32	**
1998				5	26		27	5
1999				4	31		31	5
Gear Type - Other								
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Any HMS	Non-HMS
1981	10			9	28		47	479
1982	4			13	97	**	115	253
1983	345	**		4	123	11	484	627
1984	121	**		10	157	3	292	402
1985	55	**		12	155	4	227	354
1986	26	**		10	136	3	177	263
1987	18	**		9	142	3	173	270
1988	8	**		12	102	**	124	305
1989			**	6	104		112	243
1990	**			17	100	**	120	284
1991	**			16	87		104	178
1992	5	**		12	84	3	105	388
1993	5			10	87	6	108	335
1994	**			3	5		10	405
1995				6	7	**	15	246
1996				**			**	353
1997	**			3	**		6	534
1998		**		**			3	388
1999	**	**					**	320

Note: One vessel can harvest more than one HMS and use more than one HMS gear.

Source: PacFIN, extracted February, 2001.

**Fewer than three vessels in this category.

Table A-66. Number of vessels with HMS landings by their principal port¹, 1981-99.

Year	Westport	Ilwaco	Astoria	Newport	Coos Bay	Crescent City	Eureka	Ft. Bragg	Bodega Bay	San Fran/Oak	Moss Land.	Monterey	Morro/Avila	S. Barbara Area	San Pedro	Terminal Is.	San Diego	Other
1981	102	45	106	106	140	77	116	93	73	125	94	16	117	86	128	155	435	343
1982	22	22	32	38	41	29	20	43	20	39	40	10	70	109	146	170	328	201
1983	60	23	70	87	50	107	78	70	45	166	169	73	154	103	94	172	200	469
1984	21	9	34	52	14	28	38	21	53	59	58	46	89	121	137	248	334	252
1985	12	7	17	24	7	19	57	31	40	52	70	74	114	101	103	129	182	275
1986	13	18	22	23	10	21	14	13	20	31	43	35	105	101	89	62	128	192
1987	29	27	16	59	22	12	15	17	45	32	53	32	84	95	91	53	125	238
1988	89	42	17	103	28	23	22	13	21	19	38	23	42	82	72	71	104	216
1989	27	23	11	34	20	10	7	14	20	40	26	15	56	70	52	66	109	161
1990	29	21	20	50	42	17	13	7	19	26	20	7	51	80	44	55	94	201
1991	18	7	13	25	10	9	6	4	8	26	27	10	30	69	36	41	65	93
1992	106	33	51	157	37	38	25	10	11	21	27	8	41	69	61	38	69	197
1993	43	85	44	130	42	67	35	6	17	13	37	7	38	72	68	28	48	176
1994	67	99	28	115	36	93	48	5	17	14	20	5	32	81	52	46	52	238
1995	71	60	36	79	25	17	13	7	4	15	36	11	38	67	67	8	50	172
1996	77	77	47	128	71	56	21	5	6	16	32	12	30	68	53	66	45	167
1997	106	72	104	158	63	69	40	19	33	41	83	35	72	75	74	30	49	317
1998	39	101	78	111	63	29	12	3	18	46	29	21	79	51	67	55	55	247
1999	48	82	67	109	27	17	28	15	9	29	36	14	57	60	61	104	53	198

¹A vessel's principal port is the port that accounts for the largest proportion of its total exvessel revenues.

Source: PacFIN, extracted February, 2001.

Table A-67. Number of vessels with HMS landings by principal species¹ and principal gear² categories, 1981-99.

	Principal Species						
	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ³
Year	Principal Gear - Surface Hook-and-Line						
1981	843		**	3	3	29	676
1982	374	**		14	**	14	379
1983	260	**	**	6	**	75	585
1984	438		**	8	4	15	307
1985	288	3		17	3	10	298
1986	135	**		17	**	22	215
1987	119			36	3	17	321
1988	146	5		20	6	12	304
1989	100	3		17	3	9	207
1990	109	**		14	**	8	196
1991	76			9		5	92
1992	217	**	**	13	4	8	189
1993	257	**		19	8	5	165
1994	295	**		16	**	9	127
1995	201	**		8	**	8	135
1996	332			9	**	10	115
1997	392		3	11	**	6	297
1998	311	**		**	**	13	205
1999	373			5	**	**	168
Year	Principal Gear - Drift Gillnet						
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ³
1981				8	12		10
1982				**	12		**
1983				**	15		
1984				6	17		**
1985				**	7		
1986				**	3		
1987					**		**
1988							
1989					**		
1990							
1991					**		
1992					4		
1993					5		**
1994				7	75		4
1995	3			3	67		9
1996	**			7	55		6
1997	5			5	52		5
1998	**			**	61		4
1999	**	**		5	35		3

Table A-67. Number of vessels with HMS landings by principal species¹ and principal gear² categories, 1981-99, continued.

Principal Gear - Pelagic Long Line							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ³
1981				3		**	4
1982				**			6
1983	**			**	**		**
1984					**		**
1985	**						**
1986				**			
1987				**			
1988				8			
1989				**			**
1990				**		**	**
1991				**	**		**
1992					**		10
1993							4
1994	**			**	26		7
1995				**	21		14
1996			**		15		19
1997		**		**	17	**	47
1998	**	**			23		38
1999					32		23
Principal Gear - Purse Seine							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ³
1981	**					101	27
1982		3				93	21
1983						63	23
1984	3	**				40	30
1985		4				18	25
1986		4			**	13	22
1987	3	**				22	13
1988		**				20	20
1989		**				13	20
1990	**	**				11	15
1991						6	7
1992	**	**				4	15
1993							16
1994						4	17
1995		**				**	16
1996		3				5	22
1997		**				7	24
1998		**				7	19
1999		**				5	14

Table A-67. Number of vessels with HMS landings by principal species¹ and principal gear² categories, 1981-99, continued.

Principal Gear - Harpoon							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ³
1981	**				105		
1982					88		
1983					39		
1984					46		
1985					54		**
1986					61		**
1987					62		**
1988					51		**
1989					30		
1990					28		
1991					14		
1992					35		
1993					29		**
1994					34		
1995					22		
1996					21		
1997					22		
1998					18		
1999					19		**
Principal Gear - Other							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ³
1981	10			9	28		479
1982	4			13	97	**	253
1983	345	**		4	123	11	627
1984	121	**		10	157	3	402
1985	55	**		12	155	4	354
1986	26	**		10	136	3	263
1987	18	**		9	142	3	270
1988	8	**		12	102	**	305
1989			**	6	104		243
1990	**			17	100	**	284
1991	**			16	87		178
1992	5	**		12	84	3	388
1993	5			10	87	6	335
1994	**			3	5		405
1995				6	7	**	246
1996				**			353
1997	**			3	**		534
1998		**		**			388
1999	**	**					320

¹The principal species is the species that accounted for the largest proportion of the vessel's total exvessel revenues.

²The principal gear is the gear that accounted for the largest proportion of the vessel's total exvessel revenues.

³Number of vessels whose principal species is not an HMS, but whose principal gear is that indicated.

**Fewer than three vessels in this category.

Source: PacFIN, extracted February, 2001.

Table A-68. Number of HMS vessels¹ with HMS landings by their principal port², 1981-99.

Year	Westport	Ilwaco	Astoria	Newport	Coos Bay	Crescent City	Eureka	Ft. Bragg	Bodega Bay	San Fran/Oak	Moss Land.	Monterey	Morro/Avila	S. Barbara Area	San Pedro	Terminal Is.	San Diego	Other
1981	31	17	76	20	35	8	63	26	12	75	57	8	63	19	50	110	354	88
1982	**	15	21	5	19	13	6	3		9	9	**	16	27	40	146	210	63
1983	23	8	55	23	11	3	4	4	**	8	6		10	25	22	108	92	65
1984	7	2	24	9	7	**	2	**	3	4	15		7	25	25	201	191	55
1985	3	**	13	8	5		21	2	3	6	14	11	38	22	14	105	69	72
1986	2	12	20	6	4	**	6			3	6	**	27	17	15	47	38	57
1987	10	13	9	22	6		2			**	14	**	15	15	16	38	35	69
1988	46	27	11	22	11	2	4			**	5		7	15	7	33	24	55
1989	21	10	8	6	7	**	2			8	4		5	4	5	31	16	49
1990	17	14	16	14	4		5	**		4	3			10	4	28	9	49
1991	15	4	8	12	5		3			8	2		**	5	8	13	**	29
1992	55	18	21	49	7	3	6	4	**	8	5		3	8	15	13	11	64
1993	13	71	26	53	14	2	16	**	4	4	13		5	19	25	6	3	49
1994	27	85	15	50	14	17	17	**	2	3	8	2	9	40	25	38	42	77
1995	39	51	22	38	7	**	2	2		2	15	3	6	29	36	3	37	47
1996	35	69	28	66	42	7	6	2	**	6	19	2	5	21	20	59	33	39
1997	49	59	59	56	12	11	12		**	9	47	11	19	19	31	21	38	71
1998	13	91	50	26	23	6	2		3	17	12	7	18	13	31	38	36	59
1999	16	63	47	50	14	**	9	2		5	20	2	23	11	32	89	37	60

¹HMS vessels are those whose principal species is an HMS species.

²A vessel's principal port is the port that accounts for the largest proportion of its total exvessel revenues.

**Fewer than three vessels with port as principal port.

Source: PacFIN, extracted February, 2001.

Table A-69. Number of vessels with HMS landings -- whose principal species¹ is a non-HMS species -- by principal species group and all gears, 1981-99.

Year	Principal Species Group					
	Coastal Pelagics	Crab	Groundfish	Salmon	Shrimp	Other
1981	37	179	130	288	88	476
1982	38	58	144	167	7	247
1983	38	217	179	352	10	442
1984	42	109	149	183	11	249
1985	41	78	115	211	7	228
1986	28	52	79	149	12	181
1987	18	51	74	199	13	251
1988	30	90	81	153	18	259
1989	25	53	73	110	11	200
1990	20	94	80	81	9	214
1991	12	33	49	47	10	128
1992	17	137	168	46	45	190
1993	21	158	127	47	29	142
1994	24	215	121	50	33	123
1995	22	111	80	66	16	126
1996	28	181	91	51	27	138
1997	33	246	224	127	48	231
1998	24	188	138	79	33	194
1999	21	165	102	72	16	155

¹The principal species is the species that accounted for the largest proportion of the vessel's total exvessel revenues.

Source: PacFIN, extracted February, 2001.

Table A-70. Number of annual landings by HMS vessels¹ by principal species² and principal gear³ categories, 1981-99.

	Principal Species						
	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁴
Year	Principal Gear Type - Surface Hook-and-Line						
1981	3,426		1	7	18	173	1,384
1982	1,506	1		54	21	135	888
1983	1,274	5	1	22	93	490	1,839
1984	2,187		1	58	35	83	841
1985	1,409	22		65	39	35	901
1986	549	2		157	18	103	638
1987	505			239	51	91	954
1988	578	14		83	145	81	867
1989	308	28		144	47	71	459
1990	331	7		110	26	53	530
1991	276			37		23	210
1992	723	6	2	77	61	46	424
1993	1,083	4		70	355	60	424
1994	1,273	2		56	16	70	328
1995	617	3		16	35	49	310
1996	1,333			25	34	75	226
1997	1,828		4	41	36	20	1,292
1998	1,545	4		7	16	114	613
1999	1,824			16	79	1	565
Year	Principal Gear Type - Drift Gillnet						
	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁴
1981				216	422		194
1982				89	452		20
1983				74	510		
1984				142	4,598		2
1985				4	161		
1986				1	78		
1987					29		28
1988							
1989					26		
1990							
1991					47		
1992					91		
1993					156		3
1994				155	2,306		273
1995	81			65	2,226		128
1996	2			136	2,234		109
1997	171			37	2,493		99
1998	29			50	2,644		137
1999	11	5		65	1,483		113

Table A-70. Number of annual landings by HMS vessels¹ by principal species² and principal gear³ categories, 1981-99, continued.

Principal Gear Type - Pelagic Long Line							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁴
1981				41		2	11
1982				11			11
1983	7			2	11		4
1984					62		4
1985	1						2
1986				6			
1987				5			
1988				124			
1989				8			2
1990				14		3	19
1991				16	25		22
1992					31		58
1993							9
1994	1			2	751		48
1995				59	225		48
1996			4		177		38
1997		2		3	113	5	185
1998	1	71			118		94
1999					334		65
Principal Gear type - Purse Seine							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁴
1981	8					3,138	297
1982		69				1,913	168
1983						821	315
1984	37	3				509	438
1985		46				167	268
1986		92			71	227	269
1987	6	44				253	88
1988		39				261	130
1989		7				201	131
1990	5	43				167	74
1991						53	53
1992	1	1				139	120
1993							84
1994						129	137
1995		10				57	154
1996		89				84	230
1997		3				105	264
1998		5				110	138
1999		11				56	91

Table A-70. Number of annual landings by HMS vessels¹ by principal species² and principal gear³ categories, 1981-99, continued.

Principal Gear type - Harpoon							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁴
1981	3				953		
1982					442		
1983					171		
1984				3	352		
1985					549		4
1986					713		3
1987					660		21
1988					659		3
1989					262		
1990					243		
1991					86		
1992					300		
1993					385		16
1994					503		
1995					297		
1996					269		
1997					343		
1998					235		
1999					295		1
Principal Gear type - Other							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁴
1981	18			152	796		2,379
1982	22			365	4,301	2	1,635
1983	2,031	5		13	5,306	85	3,359
1984	602	4		115	6,353	27	2,299
1985	350	2		119	5,268	15	2,346
1986	728	7		47	4,089	16	1,800
1987	42	1		96	4,292	10	1,823
1988	17	1		100	2,859	2	1,671
1989			2	49	2,764		1,217
1990	9			102	3,116	1	1,431
1991	1			152	2,484		905
1992	45	12		110	2,137	16	1,444
1993	13			236	2,683	106	1,711
1994	7			21	62		1,536
1995				79	111	9	982
1996				9			1,574
1997	39			44	2		2,388
1998		2		19			1,995
1999	1	55					1732

¹HMS vessels are those whose principal species is an HMS species and whose principal gear is an HMS gear.

²The principal species is the species that accounted for the largest proportion of the vessel's total exvessel revenues.

³The principal gear is the gear that accounted for the largest proportion of the vessel's total exvessel revenues.

⁴Number of HMS landings by vessels whose principal species is non-HMS, but whose principal gear is that indicated.

Note: Each entry in the table is the number of **all** HMS landings for the vessels with that combination of principal species and principal gear, and not the number of landings of that species for those vessels.

Source: PacFIN, extracted February, 2001.

Table A-71. Number of HMS landings by vessels whose principal species¹ is a non-HMS, by principal species group and all gears, 1981-99.

Year	Coastal Pelagics	Crab	Groundfish	Salmon	Shrimp	Other
1981	397	477	437	593	188	2,190
1982	253	116	524	420	43	1,382
1983	327	878	689	1,207	36	2,395
1984	489	343	510	457	199	1,604
1985	313	356	489	632	52	1,695
1986	290	292	310	499	166	1,153
1987	91	167	388	628	58	1,582
1988	177	290	236	506	76	1,399
1989	161	142	235	235	86	956
1990	90	299	264	246	36	1,123
1991	57	77	163	110	62	721
1992	128	385	505	69	135	829
1993	129	609	485	98	109	830
1994	181	770	481	116	129	660
1995	186	318	258	156	57	665
1996	268	580	256	105	108	882
1997	295	921	711	707	261	1,346
1998	162	713	385	202	117	1,416
1999	116	680	256	239	93	1,189

¹The principal species is the species that accounted for the largest proportion of the vessel's total exvessel revenues.

Source: PacFIN, extracted February, 2001.

Table A-72. Annual landings all HMS (mt)¹ by HMS vessels² by principal species³ and principal gear⁴ categories, 1981-99

	Principal Species						
	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
Year	Principal Gear - Surface Hook-and-Line						
1981	10,929		1	<.5	2	4,329	1,014
1982	3,991	<.5		4	8	2,705	626
1983	3,286	12	<.5	1	243	5,801	611
1984	7,027		<.5	3	16	2,127	524
1985	5,689	4		7	142	408	516
1986	3,785	<.5		40	12	898	332
1987	1,777			98	23	2,325	805
1988	2,455	3		27	216	2,490	1,100
1989	1,423	3		91	110	1,892	286
1990	2,097	23		88	23	97	291
1991	1,286			2		756	137
1992	3,031	<.5	<.5	3	37	994	287
1993	4,191	<.5		7	245	2,034	208
1994	8,356	<.5		10	27	1,953	263
1995	4,866	<.5		3	50	1,396	306
1996	11,608			2	89	741	153
1997	7,936		<.5	5	48	232	620
1998	10,535	1		<.5	21	2,723	442
1999	7,545			1	97	1	273
Year	Principal Gear - Drift Gillnet						
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
1981				186	360		191
1982				63	254		9
1983				26	233		
1984				32	450		1
1985				4	102		
1986				<.5	49		
1987							24
1988							
1989							
1990							
1991					29		
1992					71		
1993					93		1
1994				94	989		47
1995	138			63	1,169		16
1996	<.5			64	1,099		24
1997	190			9	971		45
1998	54			21	1,744		34
1999	3	1		28	1,009		33

Table A-72. Annual landings all HMS (mt)¹ by HMS vessels² by principal species³ and principal gear⁴ categories, 1981-99, continued.

Principal Gear - Pelagic Long Line							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
1981				90		1	7
1982				1			1
1983	12			<.5	2		<.5
1984					35		<.5
1985	<.5						<.5
1986				1			
1987	12			<.5			
1988				172			
1989				2			1
1990				8		1	8
1991				11	28		10
1992					95		12
1993	3						6
1994	19			8	996		51
1995				5	364		10
1996			2		491		4
1997		<.5		2	594	4	250
1998	2	151			466		13
1999					1,541		18
Principal Gear - Purse Seine							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
1981	15					129,264	1,967
1982		562				101,694	1,114
1983						74,587	1,578
1984	429	6				62,171	4,081
1985		2,598				14,890	1,919
1986		2,846			70	16,165	2,102
1987	32	278				25,060	608
1988		196				25,112	805
1989		64				17,628	856
1990	75	175				9,980	397
1991						3,466	588
1992	8	6				3,179	1,542
1993							1,366
1994						3,533	2,344
1995		111				3,289	3,746
1996		3,593				4,614	4,236
1997		939				8,131	3,512
1998		225				8,879	1,554
1999		180				4,562	500

Table A-72. Annual landings all HMS (mt)¹ by HMS vessels² by principal species³ and principal gear⁴ categories, 1981-99, continued.

Principal Gear - Harpoon							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
1981	1				289		
1982					95		
1983					30		
1984				<.5	77		
1985					186		3
1986					198		1
1987					221		12
1988					206		1
1989					51		
1990					43		
1991					14		
1992					66		
1993					153		5
1994					143		
1995					81		
1996					70		
1997					80		
1998					50		
1999					83		1
Principal Gear - Other							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
1981	37			112	481		3,023
1982	10			304	2,420	194	1,820
1983	3,485	5		5	2,840	7,258	2,363
1984	697	<.5		70	4,360	888	2,149
1985	235	2		52	4,526	1,461	1,138
1986	275	68		57	2,494	1	781
1987	171	<.5		61	2,154	1,562	561
1988	275	<.5		49	1,944	3	1,450
1989			<.5	66	1,607		419
1990	<.5			22	1,639	<.5	1,603
1991	13			74	1,561		242
1992	284	<.5		94	1,644	1,237	1,341
1993	191			73	1,820	4,888	2,029
1994	4			3	37		2,219
1995				23	85	277	1,199
1996				<.5			2,575
1997	45			17	25		2,771
1998		1		5			2,350
1999	<.5	87					1,613

¹Landings of **all** HMS, not just of the principal species.

²HMS vessels are those whose principal species is an HMS species and whose principal gear is an HMS gear.

³The principal species is the species that accounted for the largest proportion of the vessel's total exvessel revenues.

⁴The principal gear is the gear that accounted for the largest proportion of the vessel's total exvessel revenues.

⁵HMS landings by vessels whose principal species is not an HMS but whose principal gear is that indicated.

Source: PacFIN, extracted February, 2001.

Table A-73. Annual real exvessel revenues all HMS (1999 dollars)¹ by HMS vessels² by principal species³ and principal gear⁴ categories, 1981-99.

	Principal Species						
	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
Year	Principal Gear - Surface Hook-and-Line						
1981	36,178,249		793	298	14,471	8,984,648	3,413,138
1982	9,534,582	44		6,781	39,216	4,161,276	1,565,291
1983	6,619,683	40,784	93	2,998	514,577	8,327,583	1,168,651
1984	14,031,365		120	7,245	59,481	2,868,846	1,009,898
1985	9,481,244	12,425		20,593	336,274	569,319	860,161
1986	6,392,643	904		87,659	67,532	1,041,492	648,918
1987	3,883,675			257,388	163,535	3,068,363	2,047,598
1988	6,077,710	14,703		68,824	942,724	3,629,825	2,955,801
1989	3,134,448	33,722		271,265	424,081	2,400,658	733,645
1990	4,606,642	33,785		226,104	138,796	125,893	766,432
1991	2,567,470			7,190		750,194	331,571
1992	8,316,289	878	250	9,948	207,702	1,385,806	722,319
1993	9,040,828	486		18,192	1,419,100	3,200,480	436,624
1994	17,825,191	971		25,882	90,304	1,879,273	502,183
1995	8,975,377	832		7,311	138,346	1,326,002	604,846
1996	23,824,774			5,495	269,341	713,778	305,219
1997	14,793,500		382	12,312	124,317	319,167	1,121,832
1998	14,678,830	1,137		1,106	52,086	2,703,036	661,544
1999	13,922,550			2,835	252,881	864	509,830
	Principal Gear - Drift Gillnet						
	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
1981				385,978	1,295,617		647,448
1982				148,046	1,001,908		32,457
1983				64,271	928,089		
1984				115,719	1,914,616		3,538
1985				9,215	415,107		
1986				461	232,429		
1987							111,076
1988							
1989							
1990							
1991					148,668		
1992					314,020		
1993					470,025		3,306
1994				196,181	4,493,086		140,767
1995	331,557			147,843	4,846,823		58,171
1996	61			131,569	4,089,316		48,700
1997	480,257			16,173	3,222,268		128,652
1998	112,828			39,541	4,969,979		122,227
1999	6,973	6,573		51,444	3,116,595		105,873

Table A-73. Annual real exvessel revenues all HMS (1999 dollars)¹ by HMS vessels² by principal species³ and principal gear⁴ categories, 1981-99, continued.

Principal Gear - Pelagic Long Line							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
1981				110,767		2,213	22,012
1982				1,848			2,913
1983	29,813			71	1,553		162
1984					145,521		1,016
1985	991						163
1986				1,654			
1987	25,815			1,045			
1988				485,679			
1989				6,379			2,403
1990				20,431		5,368	31,130
1991				22,612	185,118		24,223
1992					530,076		29,541
1993	9,473						11,642
1994	37,360			14,915	4,843,966		164,019
1995				10,639	1,497,111		46,221
1996			2,428		1,872,221		10,701
1997		221		9,321	1,957,619	19,663	659,635
1998	2,661	547,101			1,655,052		23,448
1999					5,808,981		28,805
Principal Gear - Purse Seine							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
1981	48,541					278,047,171	4,845,982
1982		1,131,192				185,725,205	2,273,343
1983						111,602,449	2,916,268
1984	785,421	20,053				91,621,830	7,882,739
1985		3,224,231				20,716,285	2,659,315
1986		3,361,078			406,725	18,954,032	3,431,868
1987	72,741	945,010				33,539,315	2,393,904
1988		993,718				42,020,112	2,213,823
1989		85,461				23,442,578	1,325,243
1990	121,566	287,922				12,066,413	621,036
1991						3,391,576	633,219
1992	22,186	4,218				3,296,577	1,132,663
1993							1,186,700
1994						4,159,841	2,214,632
1995		93,288				2,979,710	3,012,493
1996		3,438,508				4,121,458	3,241,304
1997		962,325				8,458,185	3,439,450
1998		245,633				9,116,564	1,567,160
1999		229,234				3,920,616	507,125

Table A-73. Annual real exvessel revenues all HMS (1999 dollars)¹ by HMS vessels² by principal species³ and principal gear⁴ categories, 1981-99, continued.

Principal Gear - Harpoon							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
1981	2,483				1,850,846		
1982					725,010		
1983					222,808		
1984				416	539,527		
1985					1,187,893		13,648
1986					1,693,527		4,848
1987					2,063,910		87,663
1988					1,898,636		5,243
1989					519,195		
1990					432,731		
1991					143,712		
1992					582,870		
1993					1,155,582		39,225
1994					1,214,988		
1995					665,146		
1996					541,738		
1997					638,006		
1998					409,225		
1999					603,283		4,050
Principal Gear - Other							
Year	Albacore	Bluefin	Dorado	Sharks	Swordfish	Tropical Tunas	Non-HMS ⁵
1981	124,101			264,832	1,791,300		9,561,826
1982	25,426			739,653	8,705,587	720,121	4,241,005
1983	6,972,634	12,589		7,826	10,588,008	10,990,822	4,798,012
1984	1,361,193	1,833		211,166	18,412,872	896,852	3,905,150
1985	403,258	3,162		141,449	19,701,002	3,990,841	2,906,226
1986	530,580	128,789		194,117	13,539,168	5,415	2,819,890
1987	383,018	829		254,380	13,467,987	2,144,151	2,282,603
1988	705,235	437		171,240	11,135,624	17,444	3,635,231
1989			31	231,991	9,396,611		1,208,927
1990	548			52,311	8,479,267	88	3,008,350
1991	25,602			172,319	7,576,888		662,857
1992	633,119	1,015		206,106	7,354,917	1,306,586	3,822,636
1993	553,001			167,916	7,937,025	4,843,577	3,725,430
1994	5,966			6,886	142,227		4,645,779
1995				46,525	490,700	164,773	2,617,326
1996				440			5,287,854
1997	111,863			38,586	84,152		5,181,406
1998		13,095		8,706			3,644,821
1999	58	596,417					3,194,277

¹Exvessel revenues from **all** HMS, not just of the principal species. Real exvessel revenues are nominal revenues converted to 1999 dollars using the Gross Domestic Product implicit price deflator, to adjust for inflation.

²HMS vessels are those whose principal species is an HMS species and whose principal gear is an HMS gear.

³The principal species is the species that accounted for the largest proportion of the vessel's total exvessel revenues.

⁴The principal gear is the gear that accounted for the largest proportion of the vessel's total exvessel revenues.

⁵HMS exvessel revenues for vessels whose principal species is not an HMS but whose principal gear is that indicated.

Source: PacFIN, extracted February, 2001.

Table A-74. Total HMS landings (mt) for vessels' with a non-HMS principal species¹ by principal species, all gears, 1981-99.

Year	Principal Species					
	Coastal Pelagics	Crab	Groundfish	Salmon	Shrimp	Other
1981	1,985	707	271	493	500	2,246
1982	1,187	235	161	356	61	1,569
1983	1,605	705	224	394	59	1,566
1984	4,095	577	206	298	1,223	357
1985	1,956	593	122	351	39	513
1986	2,107	328	51	240	126	364
1987	509	281	115	502	36	567
1988	822	604	171	608	138	1,013
1989	863	205	60	152	24	257
1990	411	420	103	157	34	1,174
1991	126	83	65	82	31	591
1992	1,564	689	388	17	231	292
1993	1,964	924	292	25	152	258
1994	2,345	1,377	567	111	106	417
1995	3,747	891	124	142	77	298
1996	4,239	1,813	270	71	86	514
1997	3,518	1,821	513	312	408	625
1998	1,554	1,880	147	45	195	572
1999	502	1,324	99	121	60	333

¹The principal species is the species that accounted for the largest proportion of the vessel's total exvessel revenues.

Source: PacFIN, extracted February, 2001.

Table A-75. HMS real exvessel revenues (1999 dollars)¹ for vessels whose principal species² is a non-HMS, by principal species, all gears, 1981-99.

Year	Principal Species					
	Coastal Pelagics	Crab	Groundfish	Salmon	Shrimp	Other
1981	4,955,046	2,374,364	923,418	1,650,871	1,655,566	6,931,141
1982	2,437,045	569,950	488,838	873,886	221,360	3,523,930
1983	2,922,912	1,359,634	569,933	747,935	131,011	3,151,668
1984	7,925,593	1,131,425	431,103	533,081	1,888,826	892,313
1985	2,714,228	1,051,985	306,650	578,828	197,316	1,590,506
1986	3,459,575	793,172	249,988	495,637	685,062	1,222,090
1987	2,123,046	764,070	546,462	1,380,918	253,387	1,854,961
1988	2,250,467	1,573,505	626,761	1,752,294	401,238	2,205,833
1989	1,360,760	501,492	249,116	320,435	109,817	728,598
1990	640,303	1,056,235	371,032	422,283	147,556	1,789,539
1991	179,402	178,727	173,319	196,229	178,958	745,235
1992	1,224,839	1,829,790	1,140,375	43,118	708,672	760,365
1993	1,767,452	1,945,408	740,190	49,717	299,627	600,533
1994	2,217,993	2,649,336	1,268,965	205,889	319,335	1,005,862
1995	3,015,764	1,791,493	383,073	291,935	226,294	630,498
1996	3,246,652	3,578,149	577,937	141,177	230,913	1,118,950
1997	3,453,416	3,318,103	911,690	569,145	808,724	1,469,897
1998	1,567,664	2,751,758	280,715	76,488	357,595	984,980
1999	510,739	2,584,145	173,489	212,584	170,016	698,987

¹Real exvessel revenues are nominal revenues converted to 1999 dollars using the Gross Domestic Product implicit price deflator, to adjust for inflation.

²The principal species is the species that accounted for the largest proportion of the vessel's total exvessel revenues.

Source: PacFIN, extracted February, 2001.

Table A-76. Number of HMS vessels by principal HMS fishery¹ that had available length data², 1981-99.

Year	Albacore Surface Hook-and-Line	Coastal Purse Seine	Swordfish & Shark Drift Gillnet	Swordfish Harpoon	Large Purse Seine	HMS Longline
1981	826	2	20	103	100	4
1982	373	3	14	87	93	**
1983	266		17	39	70	4
1984	436	4	20	44	40	**
1985	286	4	9	54	18	**
1986	136	5	4	63	14	**
1987	119	5		61	22	**
1988	146	**		50	20	8
1989	100	**		32	14	**
1990	108	3		29	11	**
1991	76		**	14	9	3
1992	213	**	3	35	4	**
1993	254		4	29		**
1994	285		75	31	4	26
1995	198	**	68	22	3	22
1996	327	3	55	21	3	16
1997	382	**	57	22	7	19
1998	305	**	62	18	7	26
1999	366	**	37	18	5	31

¹The principal fishery is the species and gear that accounted for the largest proportion of the vessel's total exvessel revenues.

²98.64% of these annual vessel records had length data.

**Less than three vessels in this cell.

Source: PacFIN, extracted July 2001.

Table A-77. Number of HMS vessels by principal HMS fishery¹ whose principal port² was in Southern California, 1981-99.

Year	Albacore Surface Hook-and-Line	Coastal Purse Seine	Swordfish & Shark Drift Gillnet	Swordfish Harpoon	Large Purse Seine	HMS Longline
1981	309	**	20	103	100	3
1982	245	3	14	87	93	**
1983	85		17	38	70	3
1984	337	4	20	44	40	**
1985	148	4	8	54	18	**
1986	41	5	4	63	14	**
1987	19	5		61	22	**
1988	5	**		49	20	8
1989	13	**		32	14	**
1990	9	3		29	11	**
1991	10		**	14	9	3
1992	17	**		35	4	**
1993	17			29		
1994	22		57	31	4	24
1995	7	**	49	22	3	22
1996	47	3	33	21	3	16
1997	23	**	40	22	7	19
1998	35	**	43	17	7	17
1999	103	**	31	18	5	27

¹The principal fishery is the species and gear that accounted for the largest proportion of the vessel's total exvessel revenues.

²The principal port is the port that accounted for the largest proportion of the vessel's total exvessel revenues.

**Less than three vessels in this cell.

Source: PacFIN, extracted July 2001.

Table 78. Number of HMS vessels by principal HMS fishery¹ whose principal port² was in Central California, 1981-99.

Year	Albacore Surface Hook-and-Line	Coastal Purse Seine	Swordfish & Shark Drift Gillnet	Swordfish Harpoon	Large Purse Seine	HMS Longline
1981	209					**
1982	38					
1983	25			**		**
1984	36					
1985	74		**			
1986	40					
1987	31					
1988	10			**		
1989	20					
1990	8					
1991	11					
1992	13		**			**
1993	20		**			
1994	10		11			
1995	6		18			
1996	17		18			
1997	85		12			
1998	38		10	**		9
1999	39	**	6			3

¹The principal fishery is the species and gear that accounted for the largest proportion of the vessel's total exvessel revenues.

²The principal port is the port that accounted for the largest proportion of the vessel's total exvessel revenues.

**Less than three vessels in this cell.

Source: PacFIN, extracted July 2001.

Table A-79. Number of HMS vessels by principal HMS fishery¹ whose principal port² was in Northern California, 1981-99.

Year	Albacore Surface Hook-and-Line	Coastal Purse Seine	Swordfish & Shark Drift Gillnet	Swordfish Harpoon	Large Purse Seine	HMS Longline
1981	108					
1982	22					
1983	14					
1984	7					
1985	26					
1986	7					
1987	**					
1988	6					
1989	3					
1990	7					
1991	3					
1992	13		**			
1993	21		**			
1994	22		7			**
1995	4		**			
1996	14		**			
1997	21		3			
1998	6		5			
1999	12					

¹The principal fishery is the species and gear that accounted for the largest proportion of the vessel's total exvessel revenues.

²The principal port is the port that accounted for the largest proportion of the vessel's total exvessel revenues.

**Less than three vessels in this cell.

Source: PacFIN, extracted July 2001.

Table A-80. Number of HMS vessels by principal HMS fishery¹ whose principal port² was in Oregon, 1981-99.

Year	Albacore Surface Hook-and-Line	Coastal Purse Seine	Swordfish & Shark Drift Gillnet	Swordfish Harpoon	Large Purse Seine	HMS Longline
1981	148					
1982	47					
1983	107					
1984	46					
1985	29					
1986	33					
1987	37					**
1988	47					
1989	26					
1990	43					
1991	31					
1992	88					
1993	110					**
1994	111					
1995	77					
1996	140		**			
1997	144		**			
1998	116		**			
1999	124					**

¹The principal fishery is the species and gear that accounted for the largest proportion of the vessel's total exvessel revenues.

²The principal port is the port that accounted for the largest proportion of the vessel's total exvessel revenues.

**Less than three vessels in this cell.

Source: PacFIN, extracted July 2001.

Table A-81. Number of HMS vessels by principal HMS fishery¹ whose principal port² was in Washington, 1981-99.

Year	Albacore Surface Hook-and-Line	Coastal Purse Seine	Swordfish & Drift Gillnet	Swordfish Harpoon	Large Purse Seine	HMS Longline
1981	52					
1982	21					
1983	35					
1984	10					
1985	9					
1986	15					
1987	30					
1988	78					
1989	38					
1990	41					
1991	21					
1992	82					
1993	86					
1994	120					
1995	104					
1996	109					
1997	109		**			
1998	110		**			
1999	88					

¹The principal fishery is the species and gear that accounted for the largest proportion of the vessel's total exvessel revenues.

²The principal port is the port that accounted for the largest proportion of the vessel's total exvessel revenues.

**Less than three vessels in this cell.

Source: PacFIN, extracted July 2001.

Table A-82. Total catches (ton) of tunas in the Pacific Ocean by species, by gear. Symbols: '...' = missing data; '-' = no effort, hence no catch; '0' = effort, but no catch; estimates in parentheses have been carried over from previous or subsequent years. Data from SPC 1999 yearbook (albacore, bigeye, skipjack, yellowfin) and ISC bluefin working group.

ALBACORE											
YEAR	SOUTH PACIFIC					NORTH PACIFIC					TOTAL
	LOONGLINE	POLE-AND-LINE	TROLL	OTHER	SUB-TOTAL	LOONGLINE	POLE-AND-LINE	TROLL	OTHER	SUB-TOTAL	
1990	22532	3	7150	5635	35320	16403	8647	2905	26332	54287	89607
1991	24741	5	7930	80	32756	17712	7103	1984	11104	37903	70659
1992	30088	5	6373	58	36524	19824	13888	4935	16909	55556	92080
1993	29886	14	4193	59	34152	30593	12809	6748	4410	54560	88712
1994	33000	5	5549	78	38632	30787	26391	11814	3950	72942	111574
1995	25453	3	8134	94	33684	32507	20981	9898	3639	67025	100709
1996	24388	4	8147	105	32644	37313	20272	16948	1751	76284	108928
1997	32250	21	4793	94	37158	46595	32250	15196	3972	98013	135171
1998	35178	35	7078	55	42346	46682	28518	17059	4212	96471	138817
1999	33353	38	3641	48	37080	47077	28563	14203	5031	94874	131954
BIGEYE											
YEAR	WCPO					EPO					TOTAL
	LOONGLINE	POLE-AND-LINE	PURSE SEINE	OTHER	SUB-TOTAL	LOONGLINE	POLE-AND-LINE	PURSE SEINE	TROLL	OTHER	
1990	66801	3868	12143	8895	91707	89600	-	4701	-	11	186019
1991	51251	1909	13406	10289	76855	95400	25	3702	-	13	175995
1992	63177	1631	19384	7357	91549	69700	-	5488	-	9	166746
1993	57042	2360	14286	7392	81080	62200	-	8043	-	26	151349
1994	64879	2805	11178	8724	87586	60300	-	28683	692	-	177261
1995	53426	3807	14222	10408	81863	47800	-	36155	1154	-	166972
1996	48242	3861	18244	11601	81948	37900	-	50728	-	625	171201
1997	56883	3706	31637	11660	103886	38600	-	51617	-	2	194105
1998	60139	2473	18342	11639	92593	36000	-	35036	-	12	163641
1999	56402	(2473)	34937	11553	105365	(36000)	-	42574	-	607	184546

Table A-82, continued.

SKIPJACK											
YEAR	WCPO					EPO				TOTAL	
	LOGLINE	POLE-AND-LINE	PURSE SEINE	OTHER	SUB-TOTAL	POLE-AND-LINE	PURSE SEINE	OTHER	SUB-TOTAL		
1990	1292	225868	604460	60883	892503	835	69927	1883	72645	965148	
1991	1541	289288	773784	65552	1130166	1670	59707	1900	63277	1193443	
1992	1063	224813	706514	76183	1008573	1860	81026	1092	83978	1092551	
1993	940	270163	580717	55785	907605	3633	81500	2256	87389	994994	
1994	1793	220319	720394	48269	990774	3110	71449	898	75457	1066231	
1995	1390	271445	727433	60644	1060912	5237	130974	2038	138249	1199161	
1996	1112	233559	739757	57348	1031776	2583	108444	1328	112355	1144131	
1997	1411	225716	641974	78074	947175	3292	158398	119	161809	1108984	
1998	1572	235176	929492	78109	1244349	1642	142160	164	143966	1388315	
1999	1650	241081	780853	78033	1101617	1938	259066	1899	262903	1364520	
YELLOWFIN											
YEAR	WCPO					EPO					TOTAL
	LOGLINE	POLE-AND-LINE	PURSE SEINE	OTHER	SUB-TOTAL	LOGLINE	POLE-AND-LINE	PURSE SEINE	OTHER	SUB-TOTAL	
1990	72295	14271	175239	91171	352976	30000	2664	268871	1751	303286	656262
1991	59427	13013	211043	102536	386019	25400	2909	234974	1069	264352	650371
1992	69008	15745	240852	69007	394612	16100	3885	232811	3153	255949	650561
1993	64379	14385	243108	73086	394958	24600	5089	223519	3463	256671	651629
1994	67128	14614	223584	85859	391185	24700	3755	213177	1455	243087	634272
1995	73524	16868	188395	102067	380854	16900	1284	220486	2047	240717	621571
1996	71220	17432	122754	110853	322259	11940	3733	245313	1056	262042	584301
1997	67477	14610	263744	112278	458109	15240	4386	252214	1231	273071	731180
1998	55586	13520	258433	112317	439856	14640	5126	260804	330	280900	720756
1999	52580	13643	218177	112347	396747	(14640)	1888	285782	2330	304640	701387

Table A-82, continued.

BLUEFIN														
YEAR	WPO								EPO					TOTAL
	LOGLINE	POLE-AND-LINE	PURSE SEINE	TROLL	SET NET	DRIFTNET	OTHER	SUB-TOTAL	LOGLINE	POLE-AND-LINE	PURSE SEINE	DRIFTNET	SUB-TOTAL	
1990	585	536	2827	1756	768	256	151	6879	0	62	1430	10	1502	8381
1991	627	286	8522	3015	1734	236	291	14711	0	0	419	4	423	15134
1992	1037	166	6319	1331	1227	888	290	11258	9	1	1828	21	1859	13117
1993	1328	68	5754	895	899	159	43	9146	45	5	580	56	686	9832
1994	1521	302	7150	2988	434	126	53	12574	24	1	971	27	1023	13597
1995	920	427	16668	3506	1281	110	833	23745	27	1	630	19	677	24422
1996	1873	217	6713	2561	480	67	110	12021	53	2	8223	42	8320	20341
1997	2823	77	11585	1611	311	109	1064	17580	52	2	2567	57	2678	20258
1998	3134	108	4860	1749	381	91	200	10523	56	48	1772	40	1916	12439
1999	3490	124	14238	1601	377	59	469	20358	39	3	2513	21	2576	22934

Table A-83. Per Capita U.S. Fish Consumption

Year	Civilian Resident Population July 1 Million Persons	Fresh and Frozen	Canned	Cured	Total
Pounds, Edible Meat					
1995	261.4	10.0	4.7	0.3	15.0
1996	264.0	10.0	4.5	0.3	14.8
1997	266.4	9.9	4.4	0.3	14.6
1998	269.1	10.2	4.4	0.3	14.9
1999	271.5	10.4	4.6	0.3	15.3

Table A-84. U.S. Annual Per Capita Consumption of Canned Fishery Products, 1995-99

Year	Salmon	Sardines	Tuna	Shellfish	Other	Total
Pounds						
1995	0.5	0.2	3.4	0.3	0.3	4.7
1996	0.5	0.2	3.2	0.3	0.3	4.5
1997	0.4	0.2	3.1	0.3	0.4	4.4
1998	0.3	0.2	3.4	0.3	0.2	4.4
1999	0.3	0.2	3.4	0.4	0.3	4.6

Table A-85. U.S. Annual Per Capita Consumption (lbs per person) of Certain Fishery Items, 1995-99

Year	Fillets and Steaks	Sticks and Portions	Shrimp All Preparations
1995	2.9	1.2	2.5
1996	3.0	1.0	2.5
1997	3.0	1.0	2.7
1998	3.2	0.9	2.8
1999	3.2	1.0	??

Table A-86. Most Popular Seafood Consumption per Capita in USA

Rank	Species	Pounds per Capita
1	Tuna	3.5
2	Shrimp	3
3	Salmon	1.7
4	Alaska Pollock	1.57
5	Catfish	1.16
6	Cod	0.77
7	Crabs	0.54
8	Clams	0.46
9	Flatfish	0.39
10	Scallops	0.2

Source: National Fisheries Institute (<http://www.annapolisseafoodmarket.com/toptenlist.htm>)

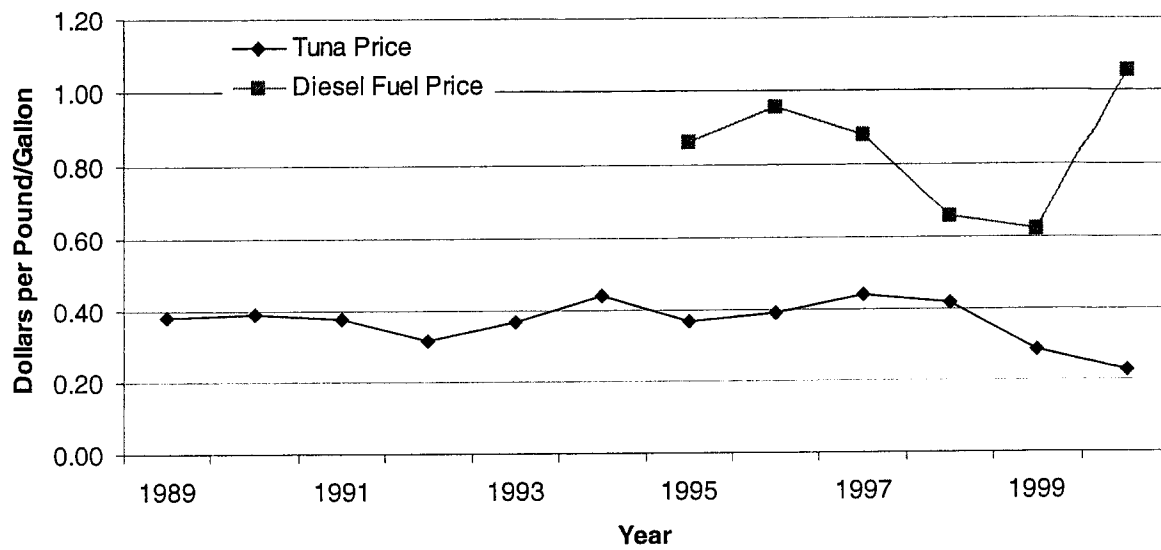


Figure 2-1. Average Samoa 4 to 7.5 pound Tuna and Diesel Fuel Prices, 1989-2000.

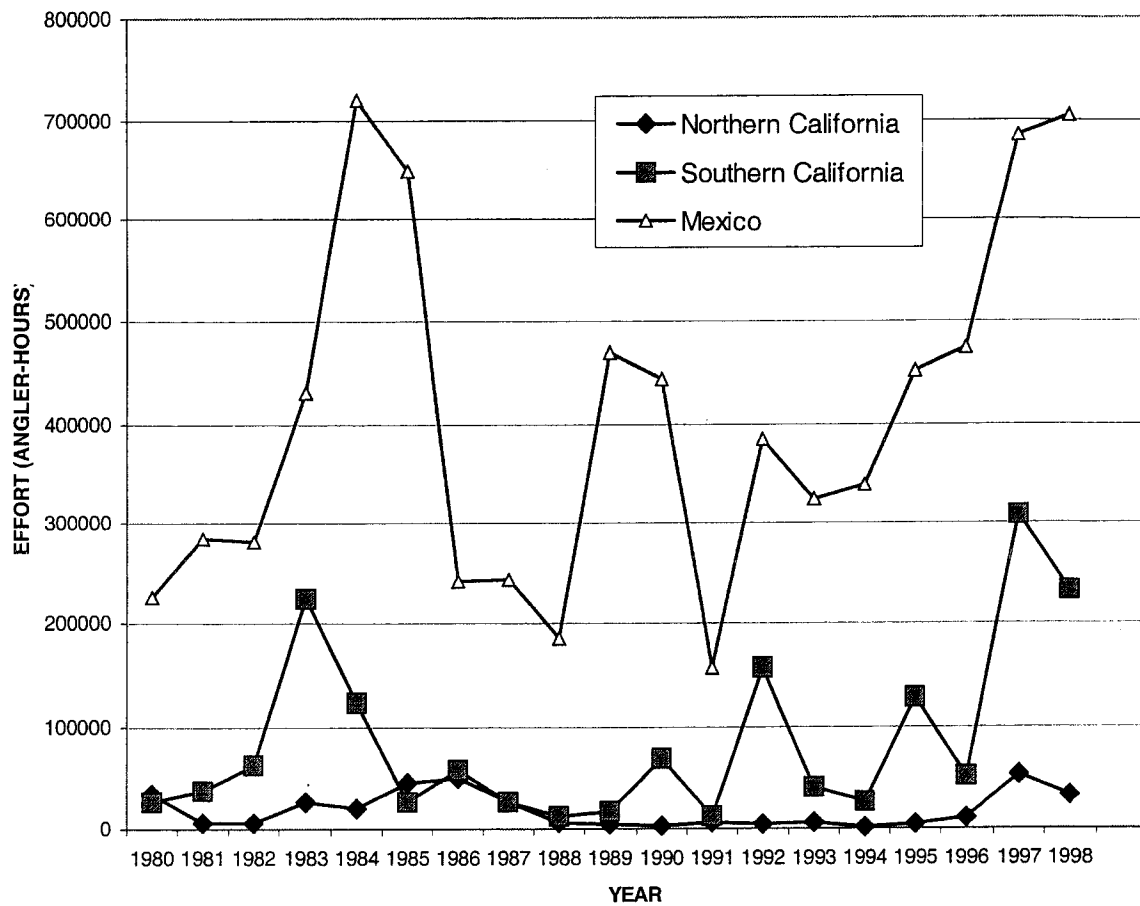


Figure 2-2. Total CPFV logbook reported HMS fishing effort, 1980 - 1998

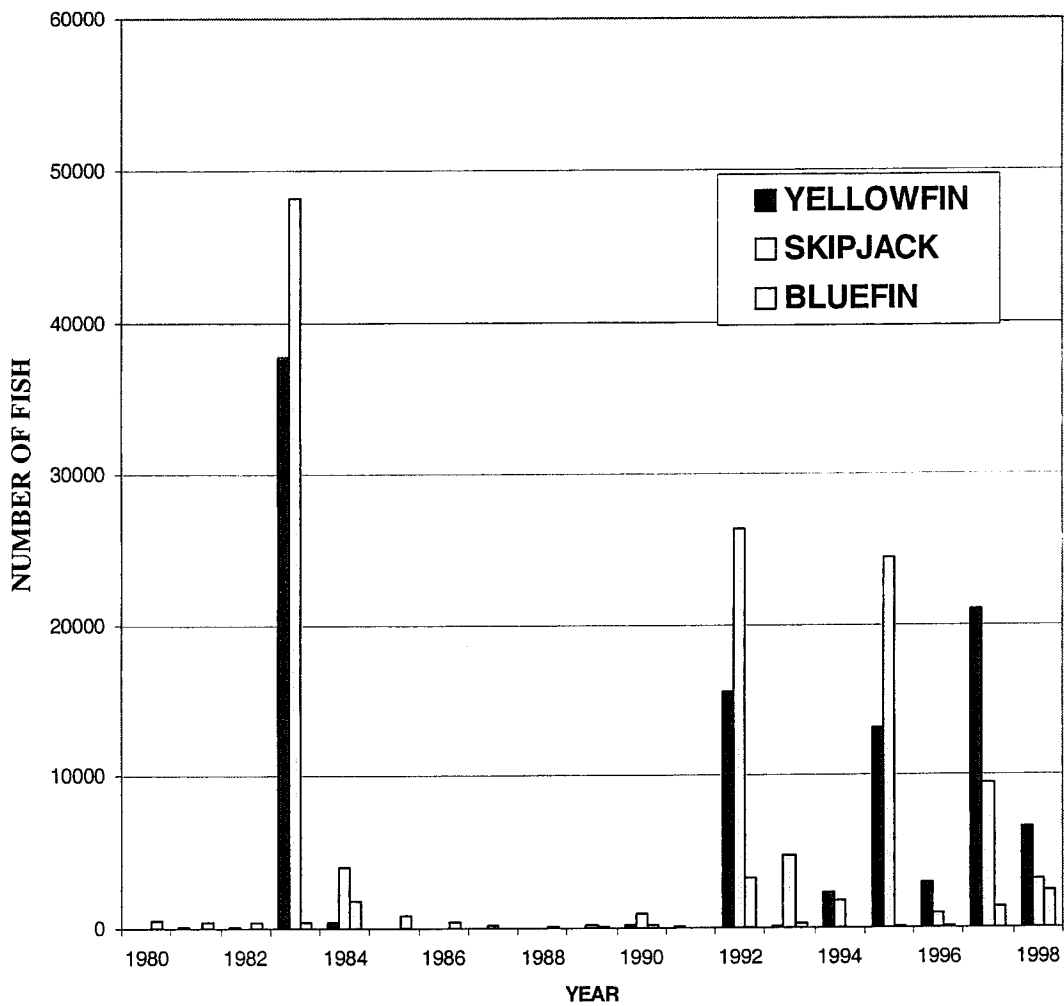


Figure 2-3. California CPFV Tuna Catch, 1980 - 1998

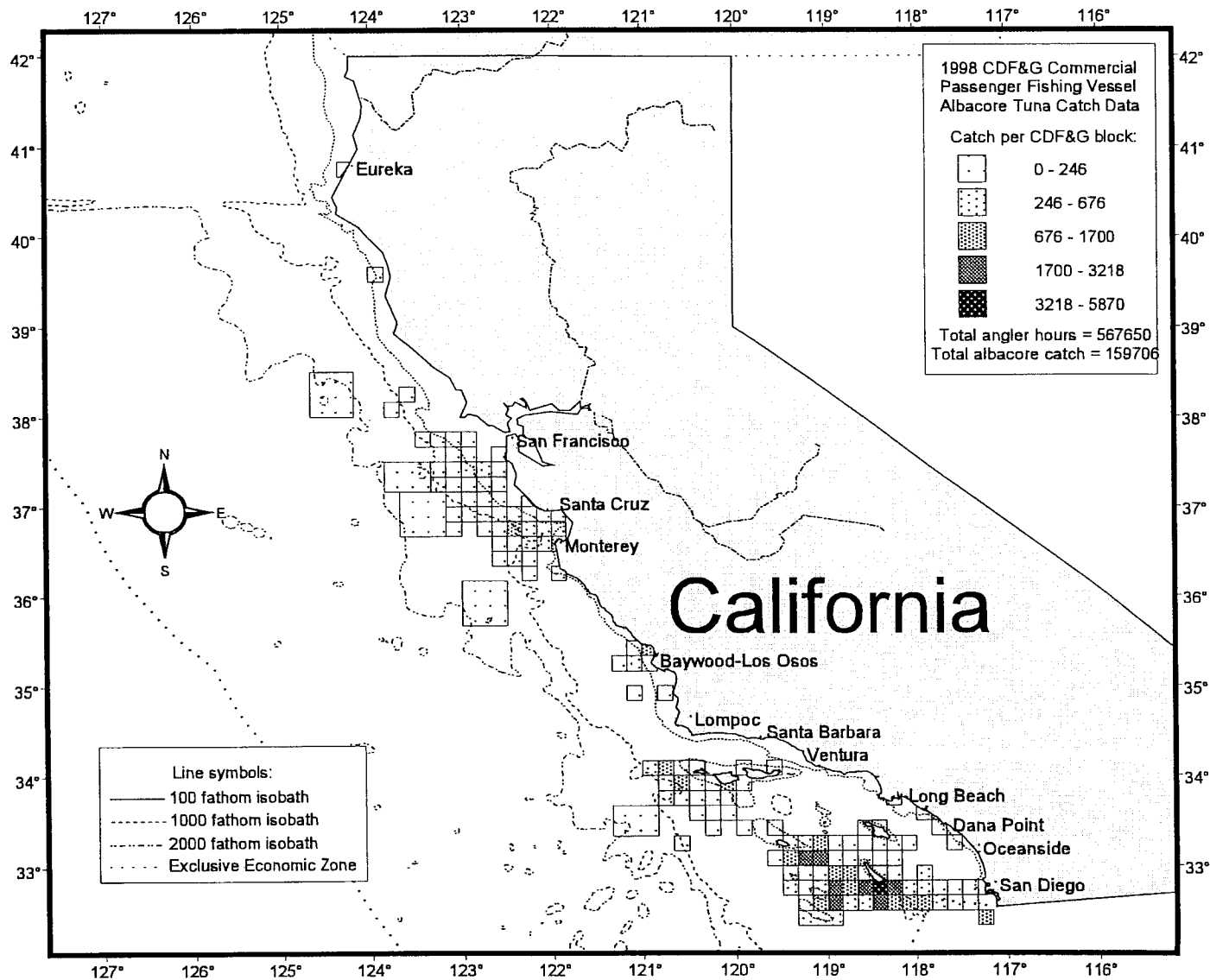


Figure 2-4. California CPFV catch for 1998, by CDFG block number for albacore.

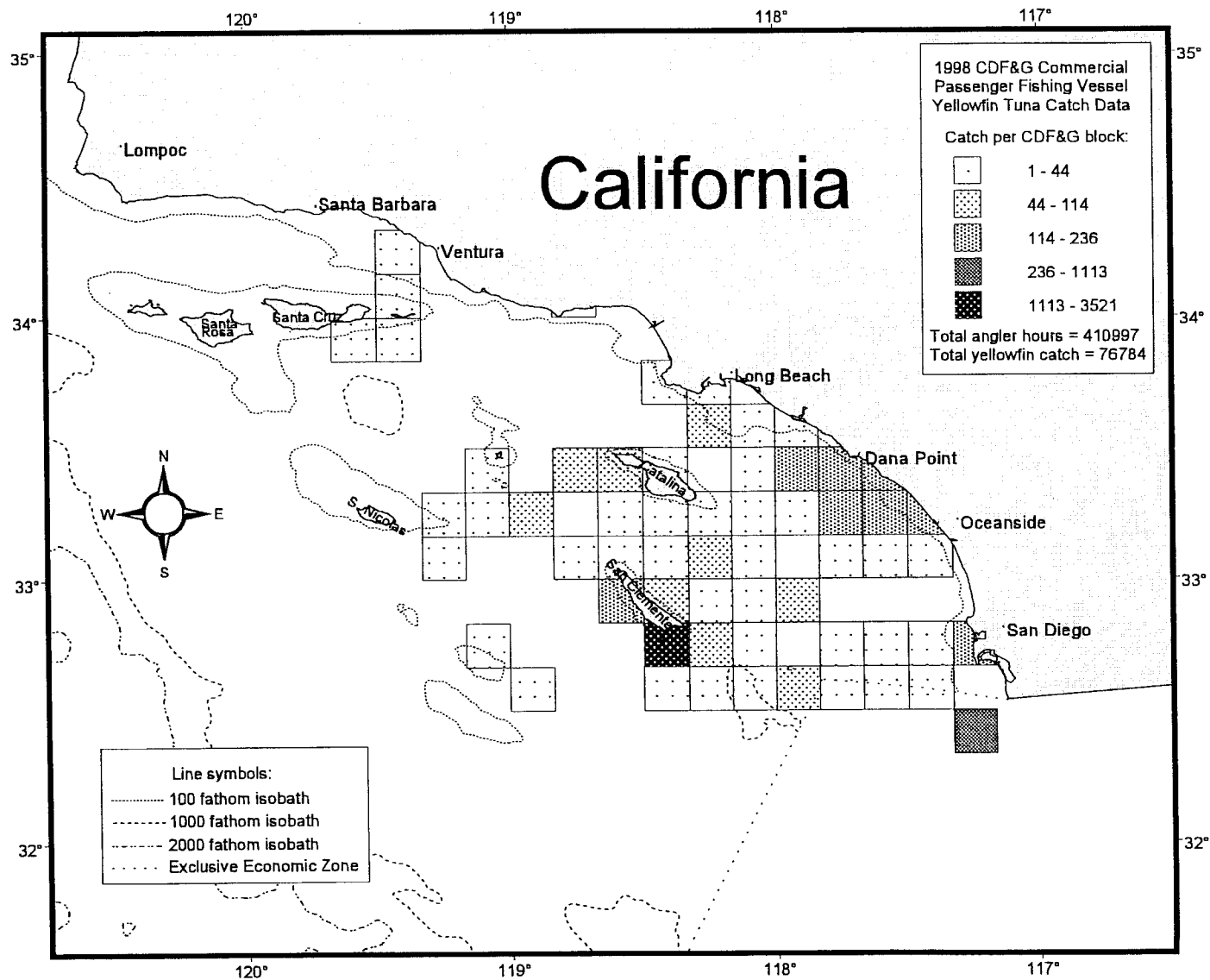


Figure 2-5. California CPFV catch for 1998, by CDFG block number for yellowfin tuna.

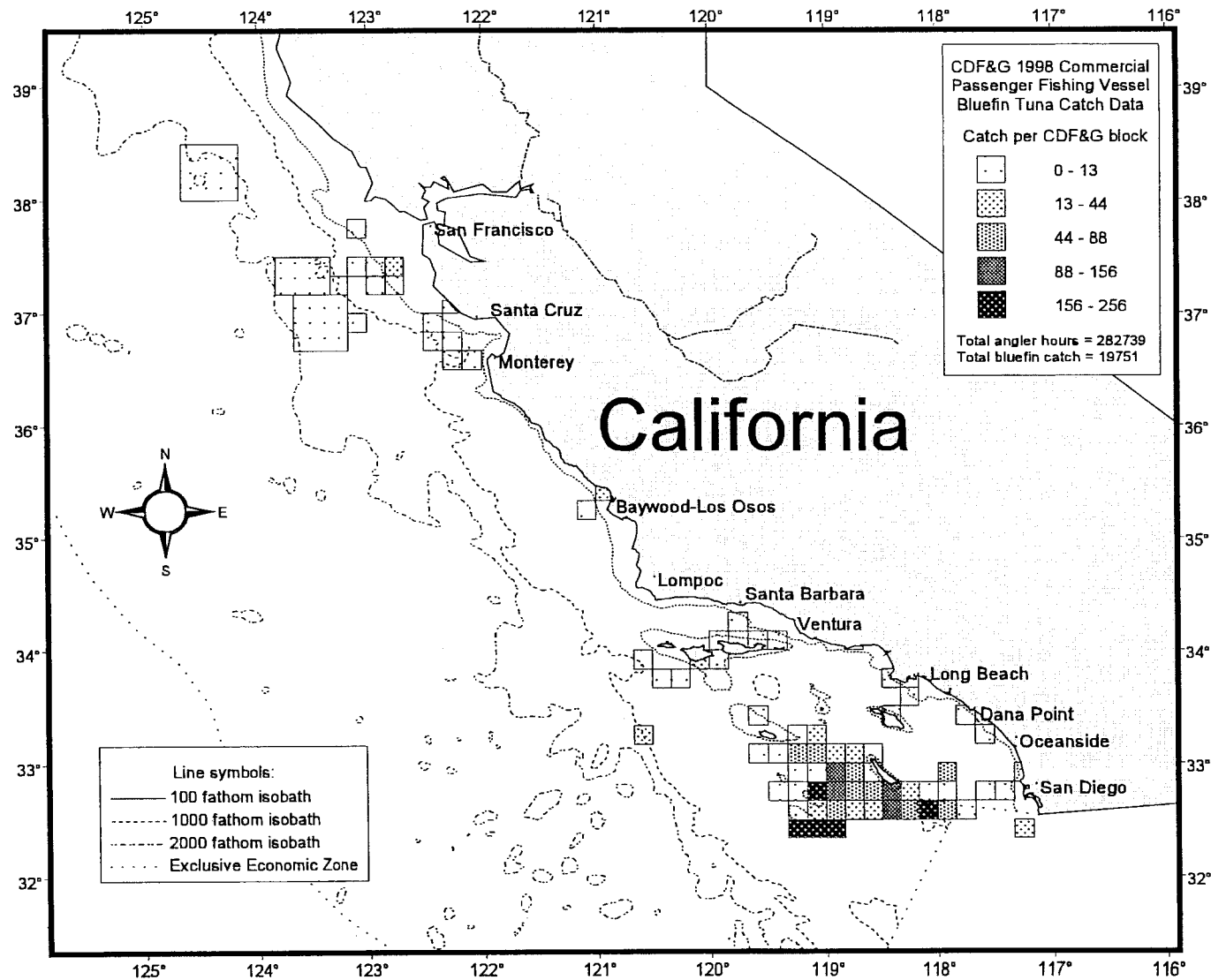


Figure 2-6. California CPFV catch for 1998, by CDFG block number for bluefin tuna.

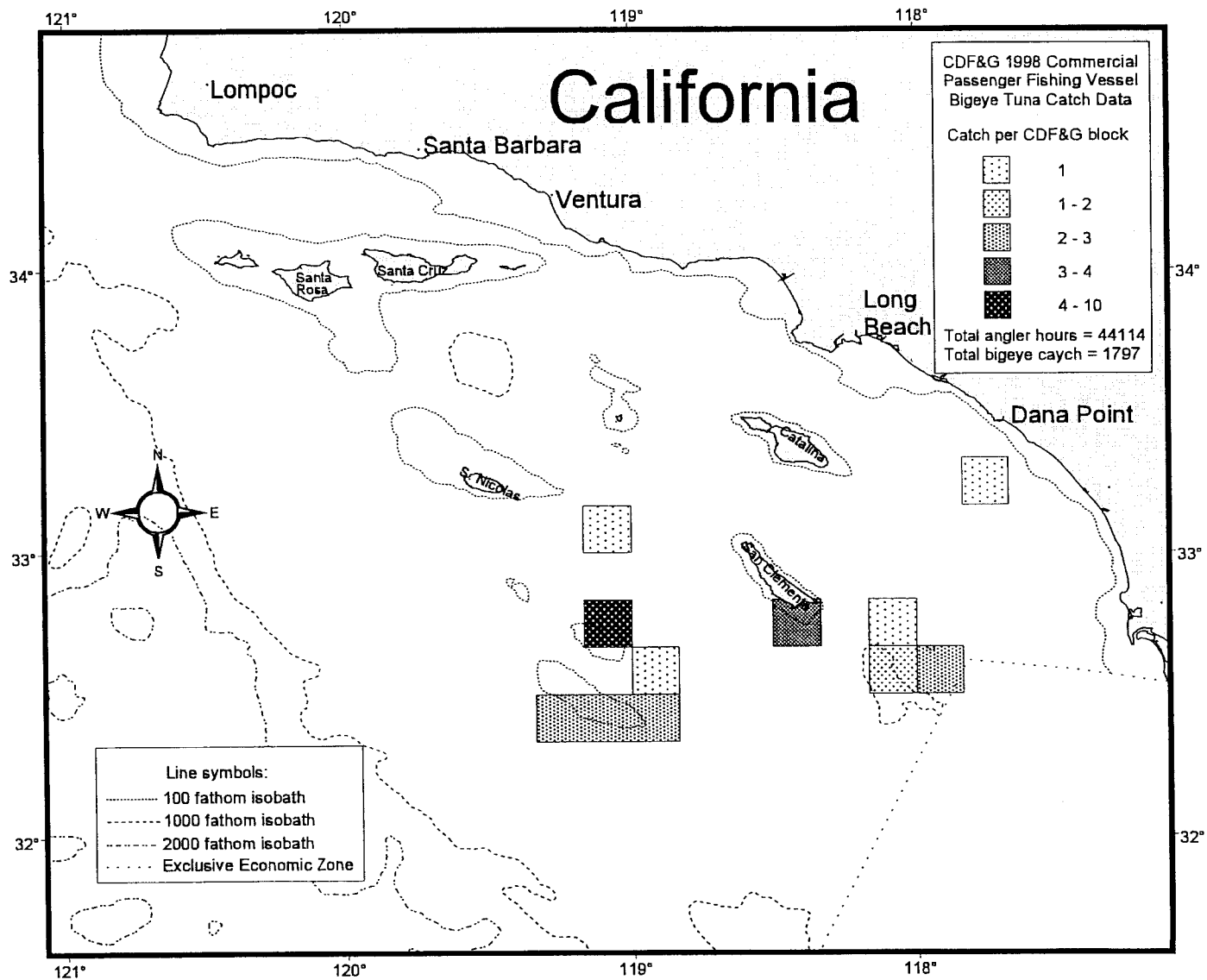


Figure 2-7. California CPFV catch for 1998, by CDFG block number for bigeye tuna.

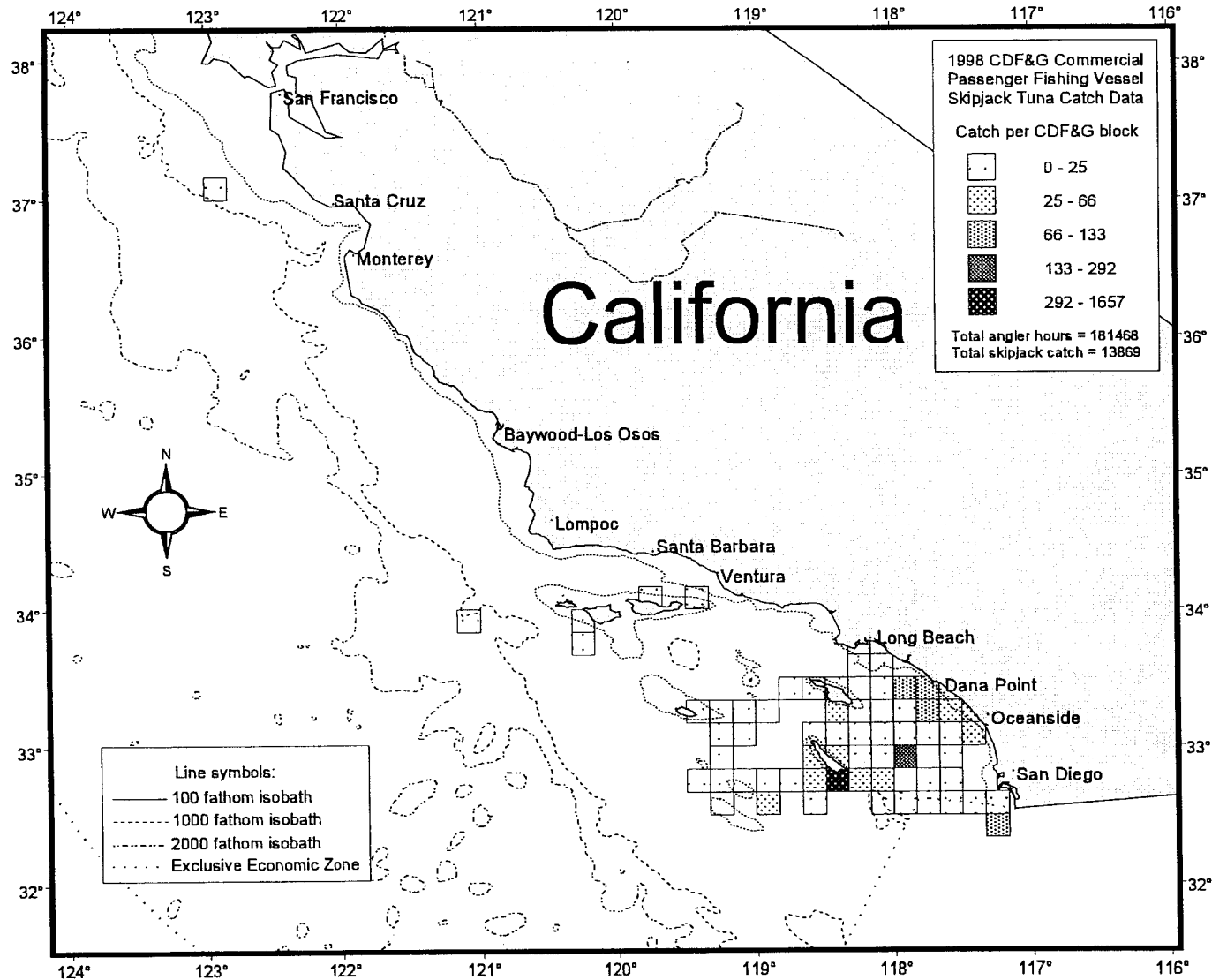


Figure 2-8. California CPFV catch for 1998, by CDFG block number for skipjack tuna.

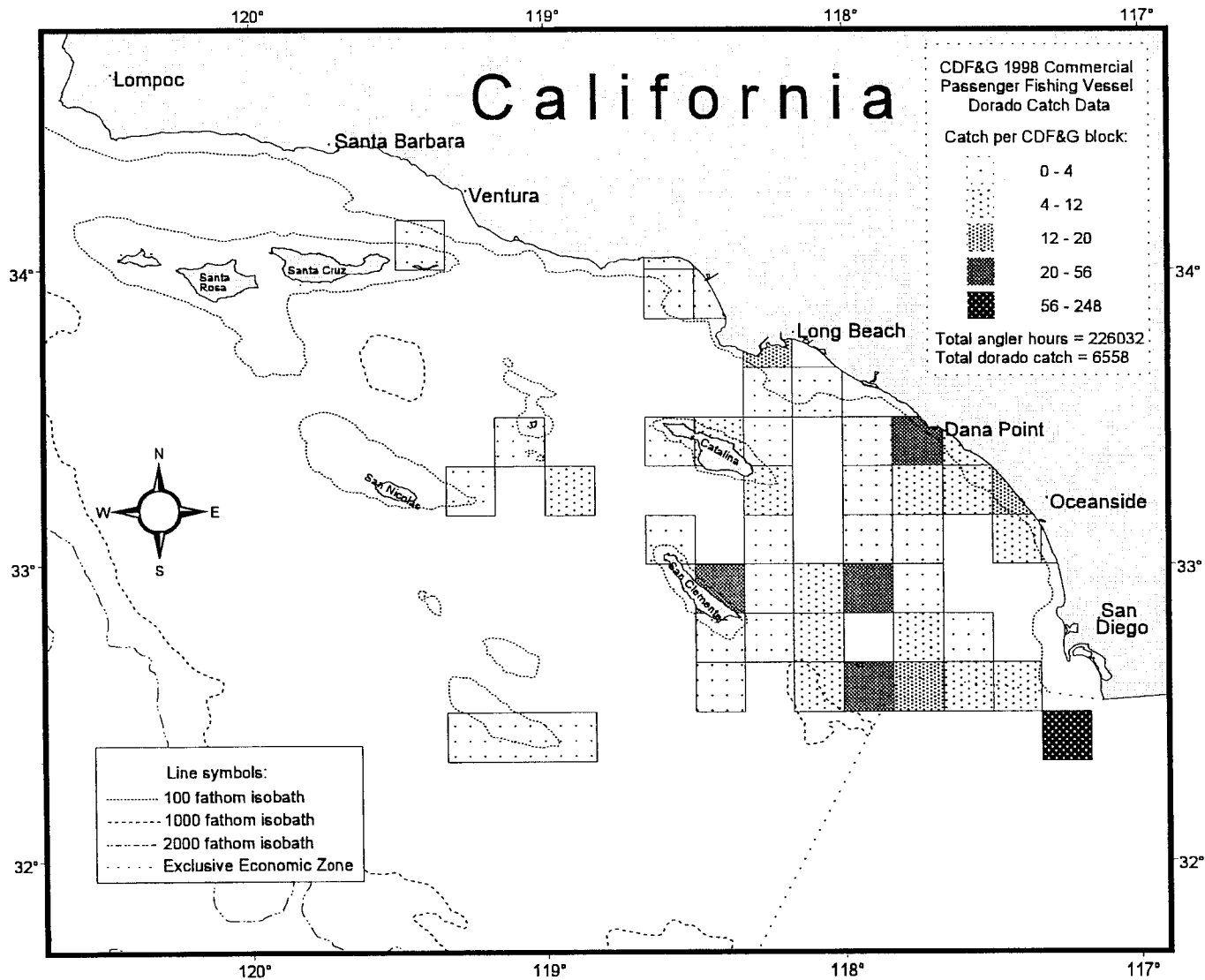


Figure 2-9. California CPFV catch for 1998, by CDFG block number for dorado.

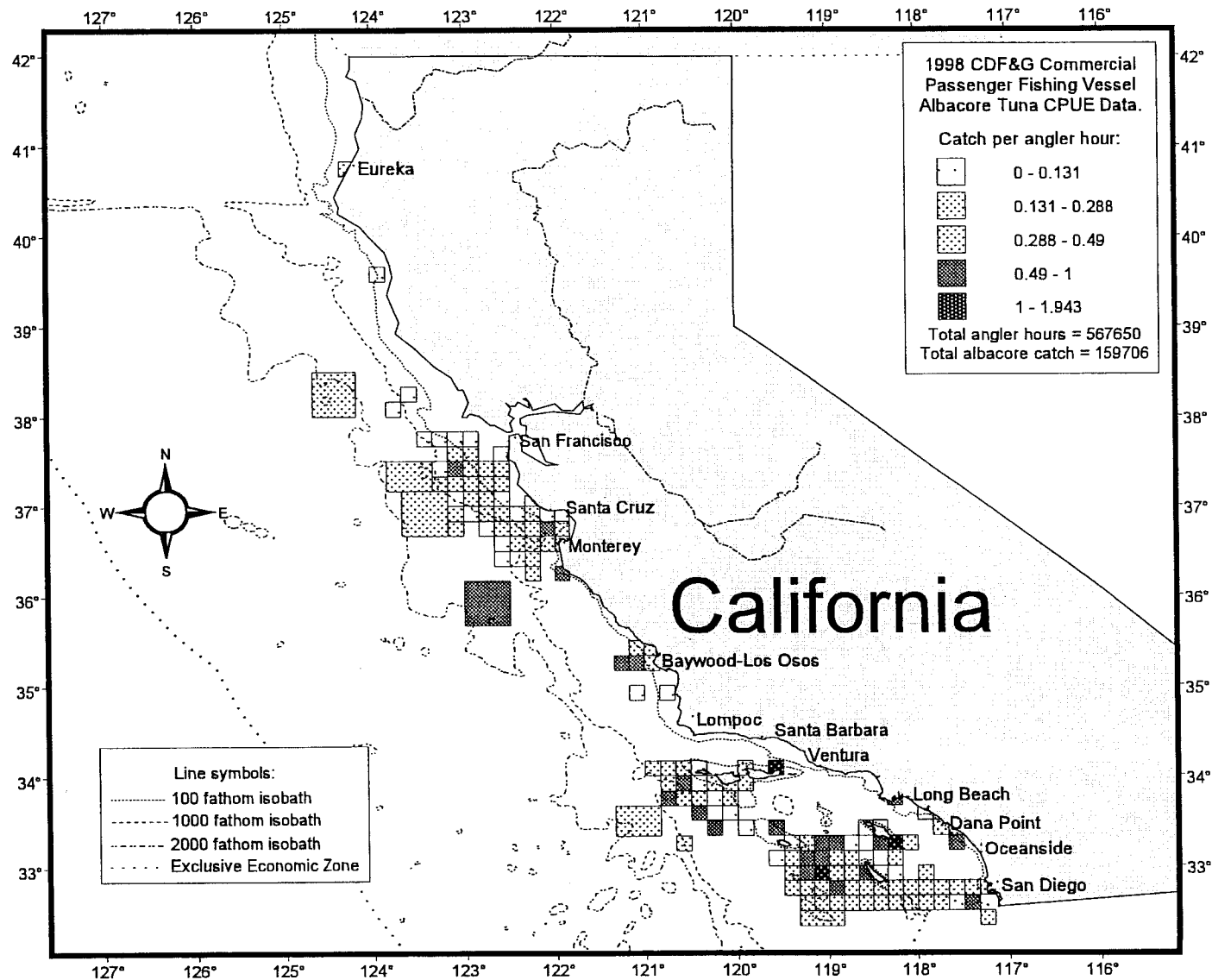


Figure 2-10. California CPV catch-per-angler-hour for 1998, by block number for albacore.

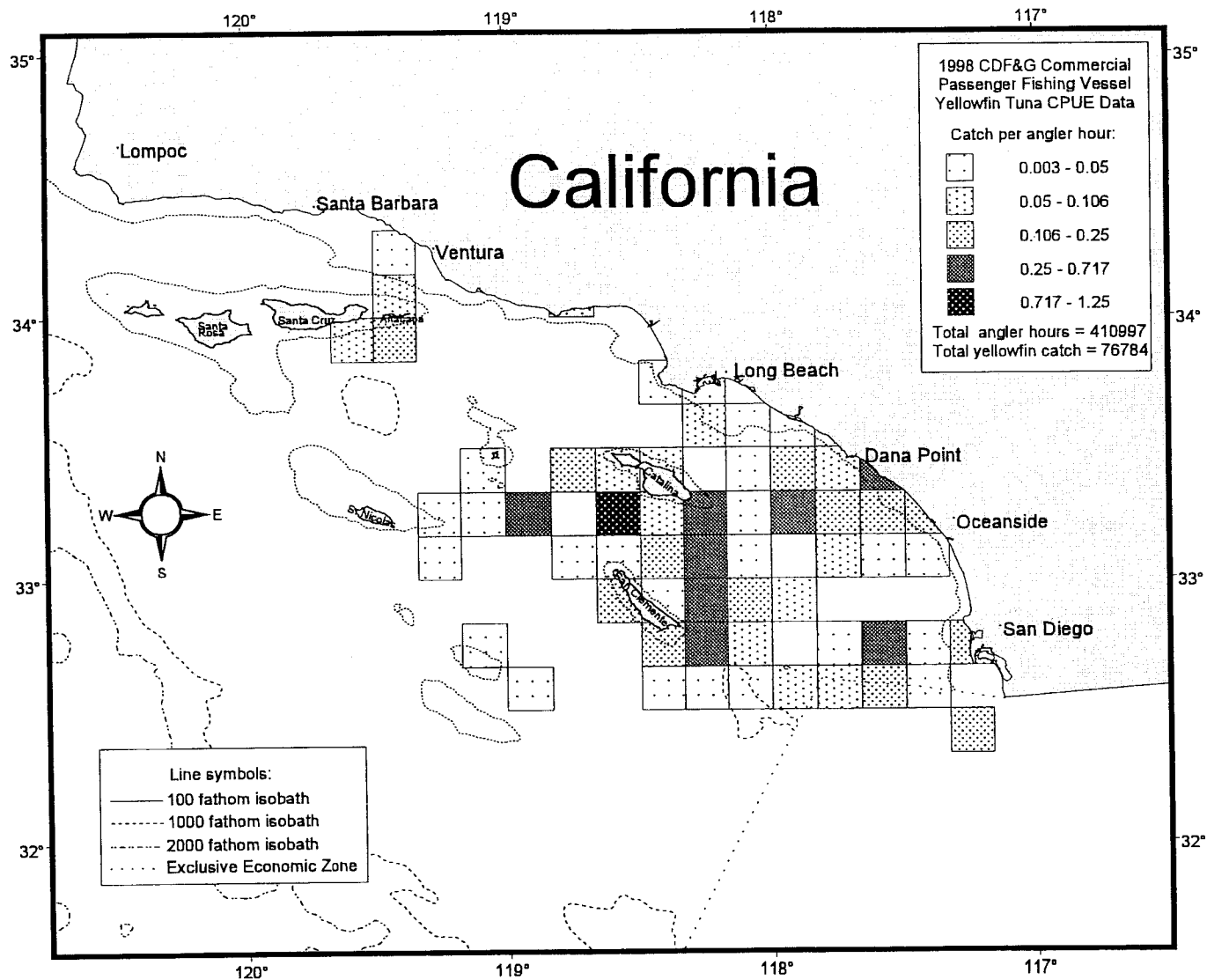


Figure 2-11. California CPFV catch-per-angler-hour for 1998, by block number for yellowfin tuna.

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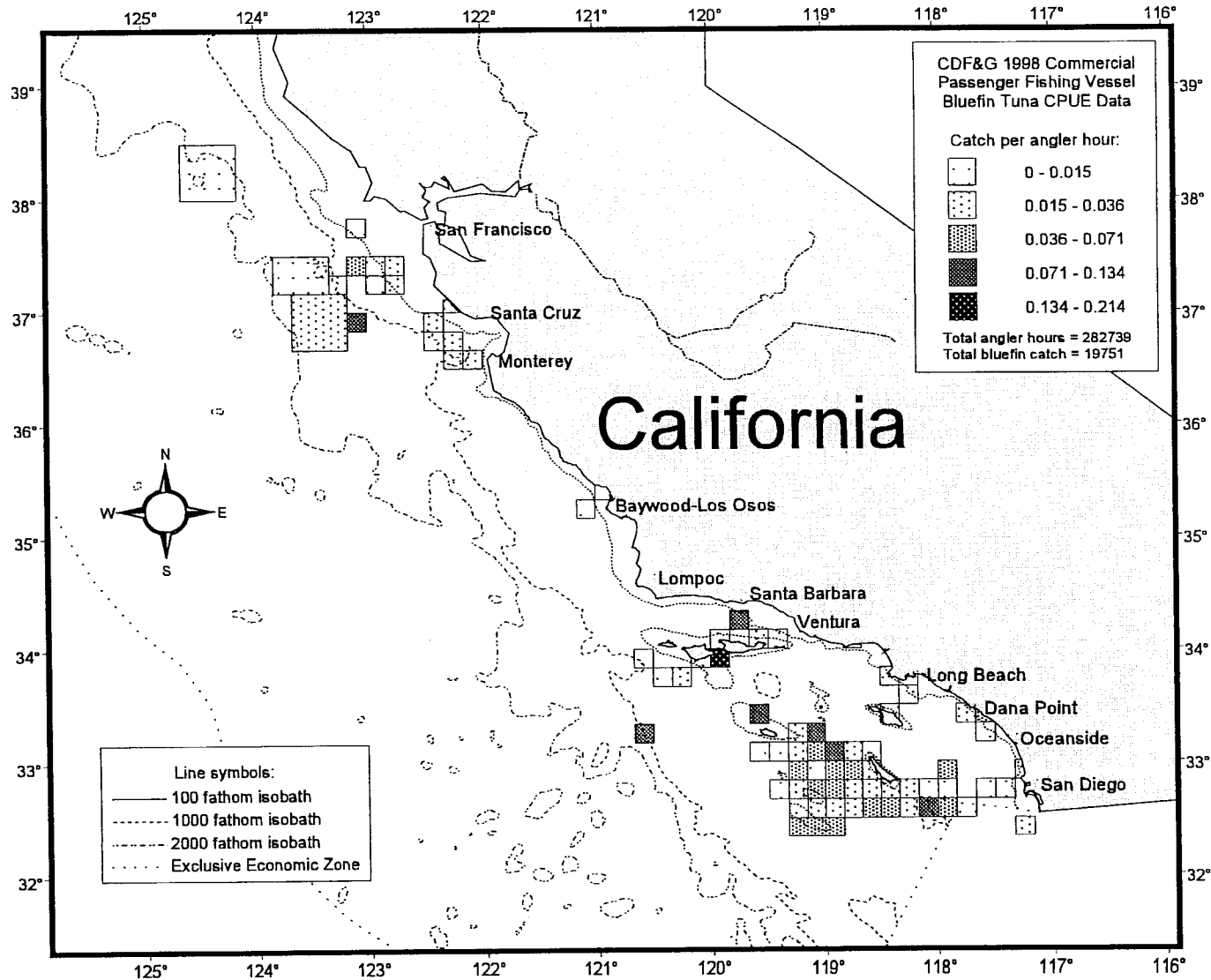


Figure 2-12. California CPFV catch-per-angler-hour for 1998, by block number for bluefin tuna.

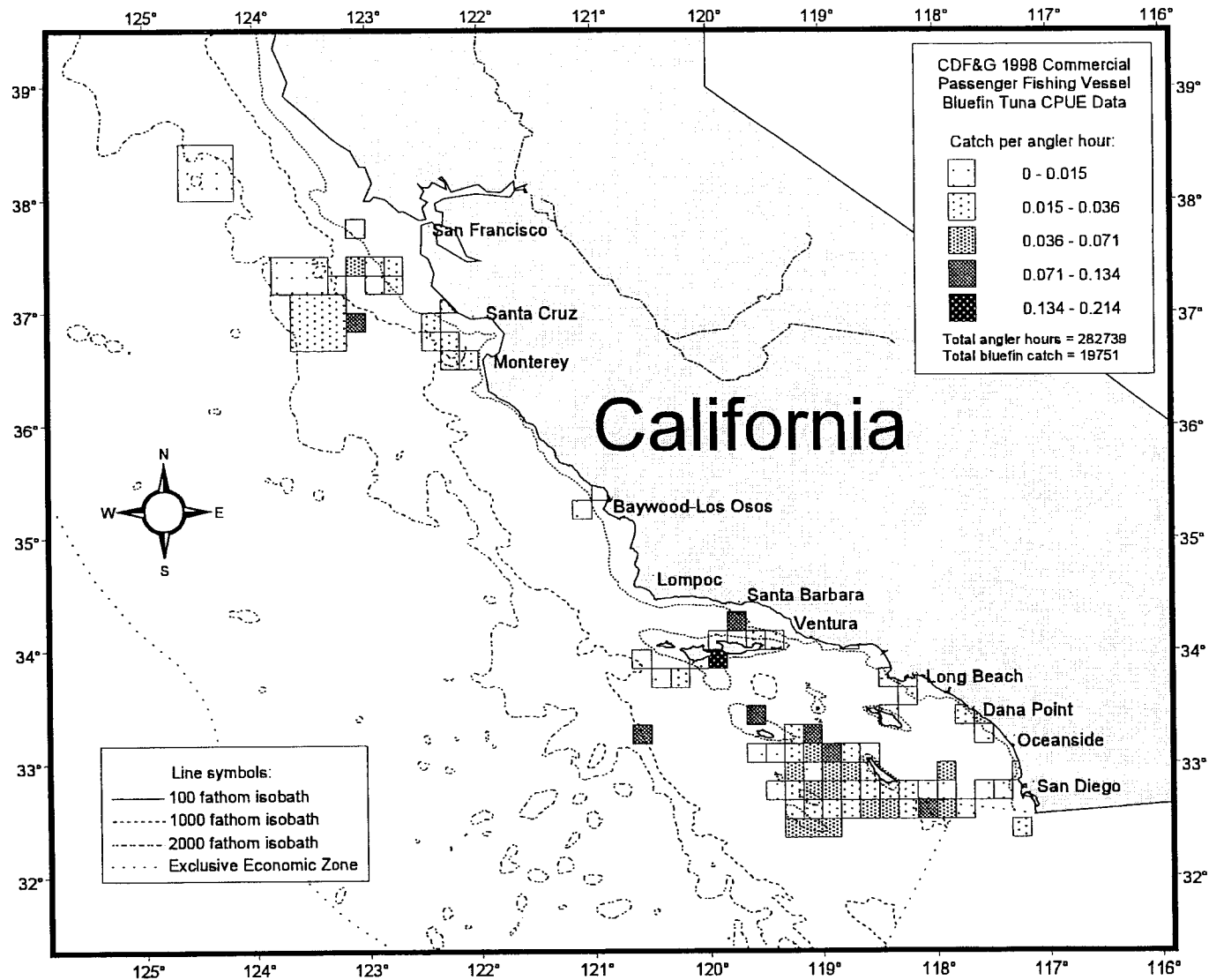


Figure 2-13. California CPFV catch-per-angler-hour for 1998, by block number for bigeye tuna.

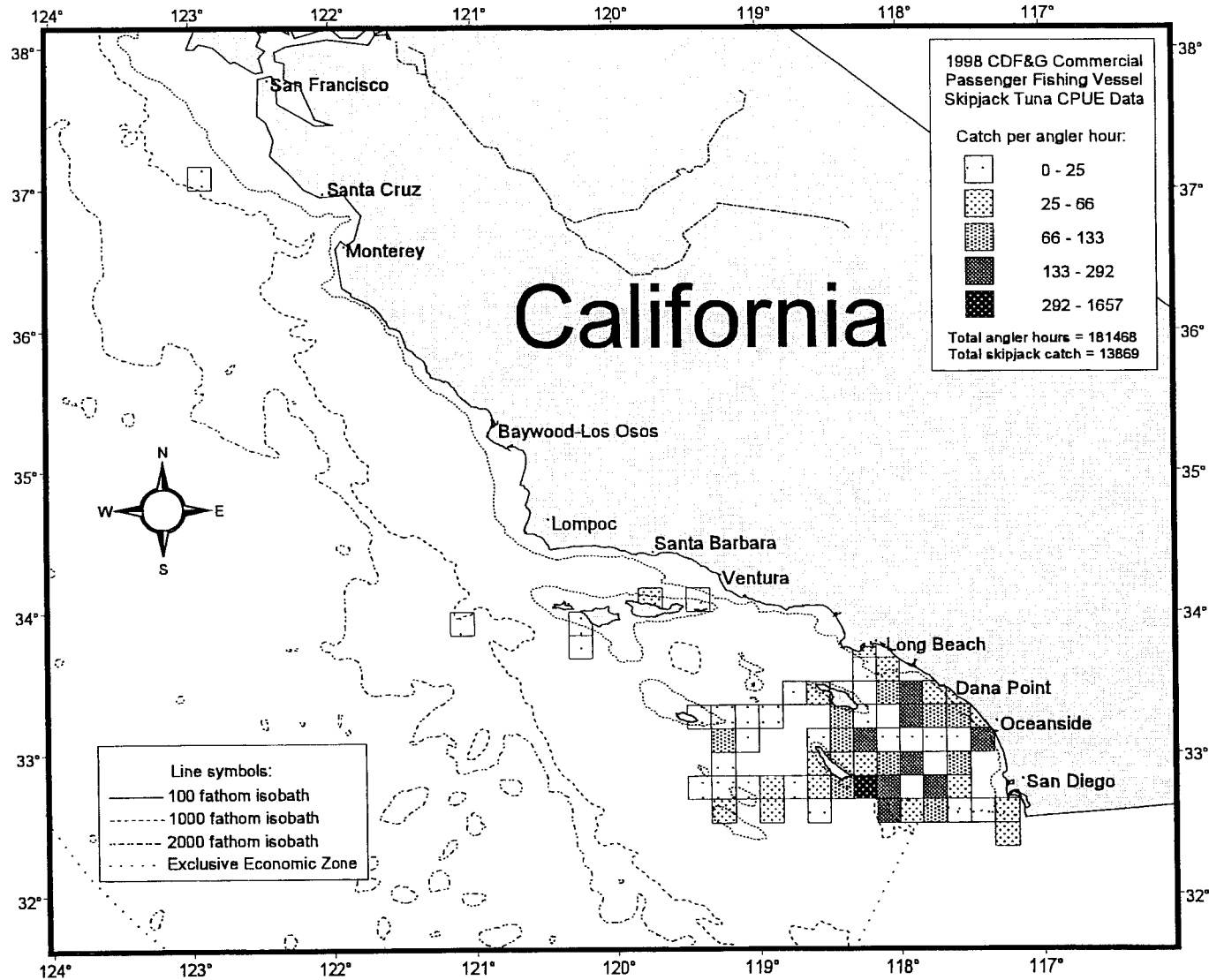


Figure 2-14. California CPFV catch-per-angler-hour for 1998, by block number for skipjack tuna.

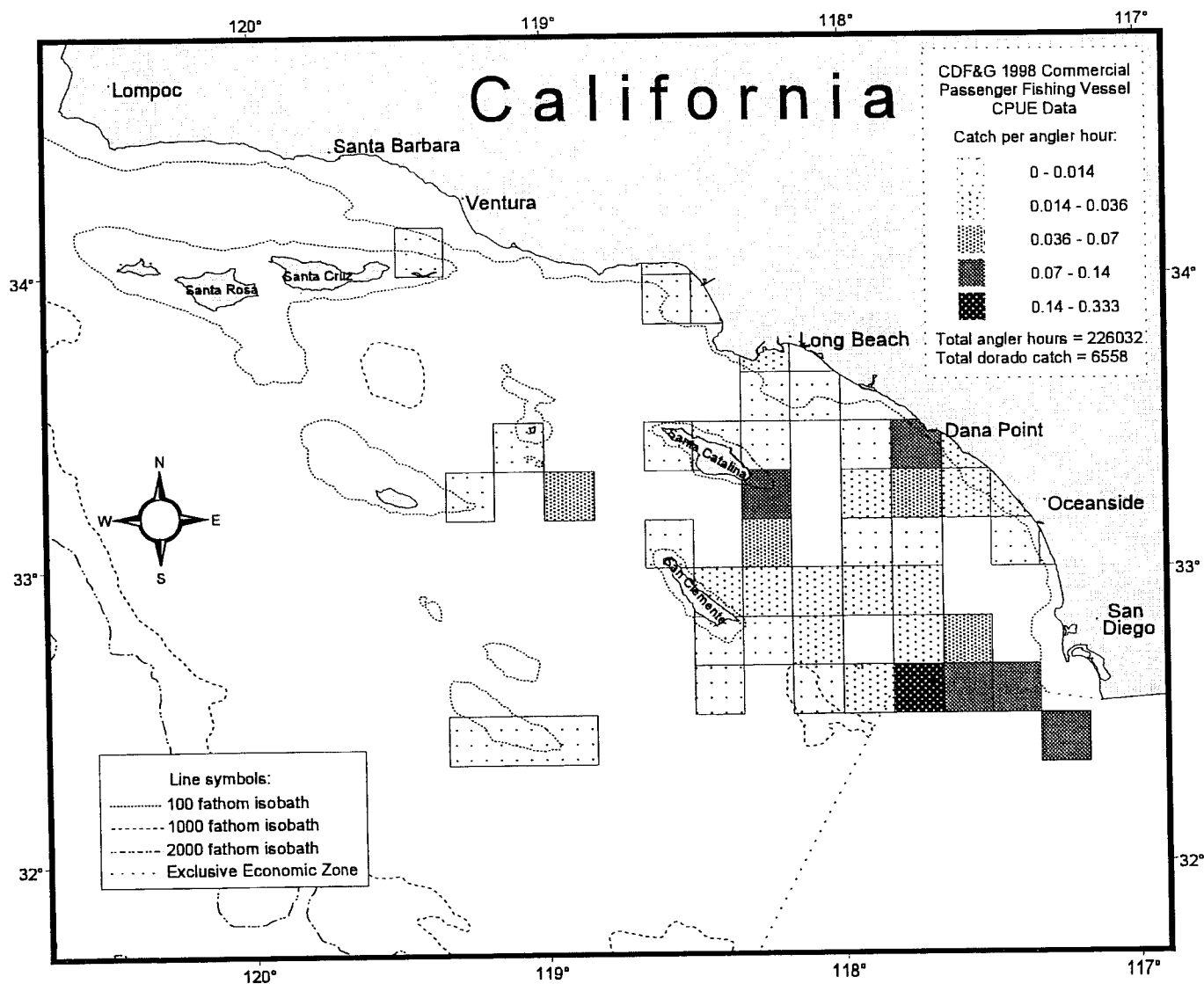


Figure 2-15. California CPFV catch-per-angler-hour for 1998, by block number for dorado.
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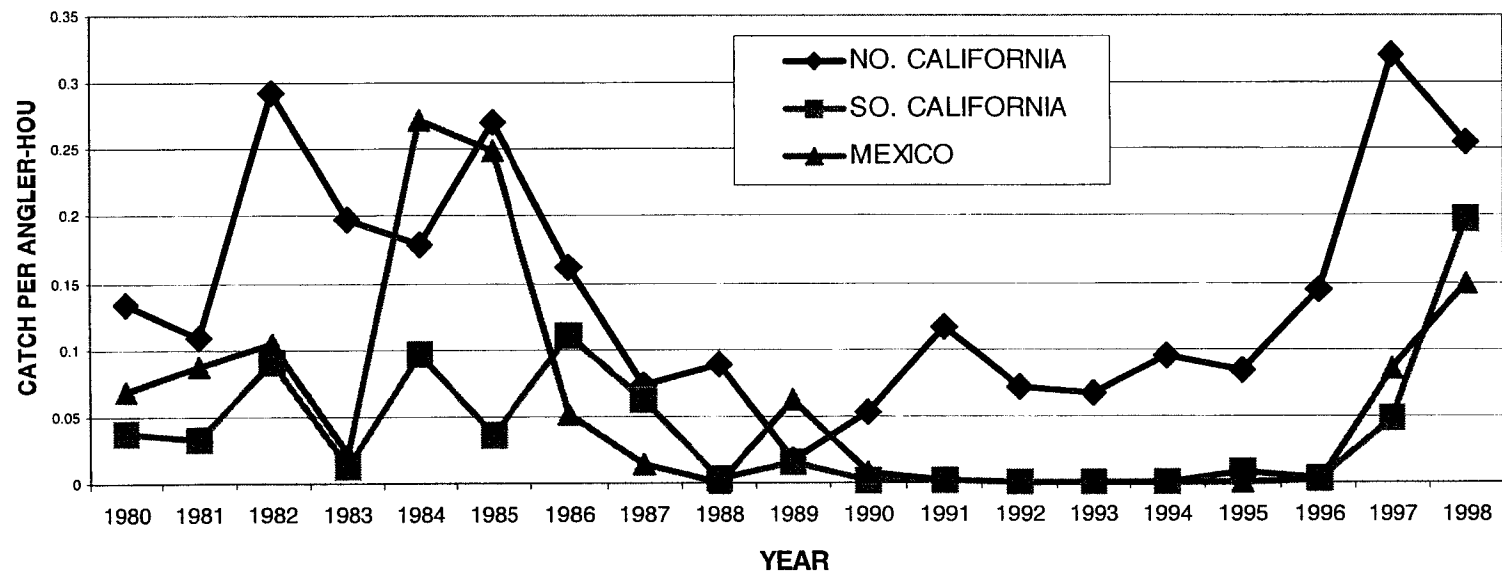


Figure 2-16. Reported Albacore recreational CPUE, 1980-1998.

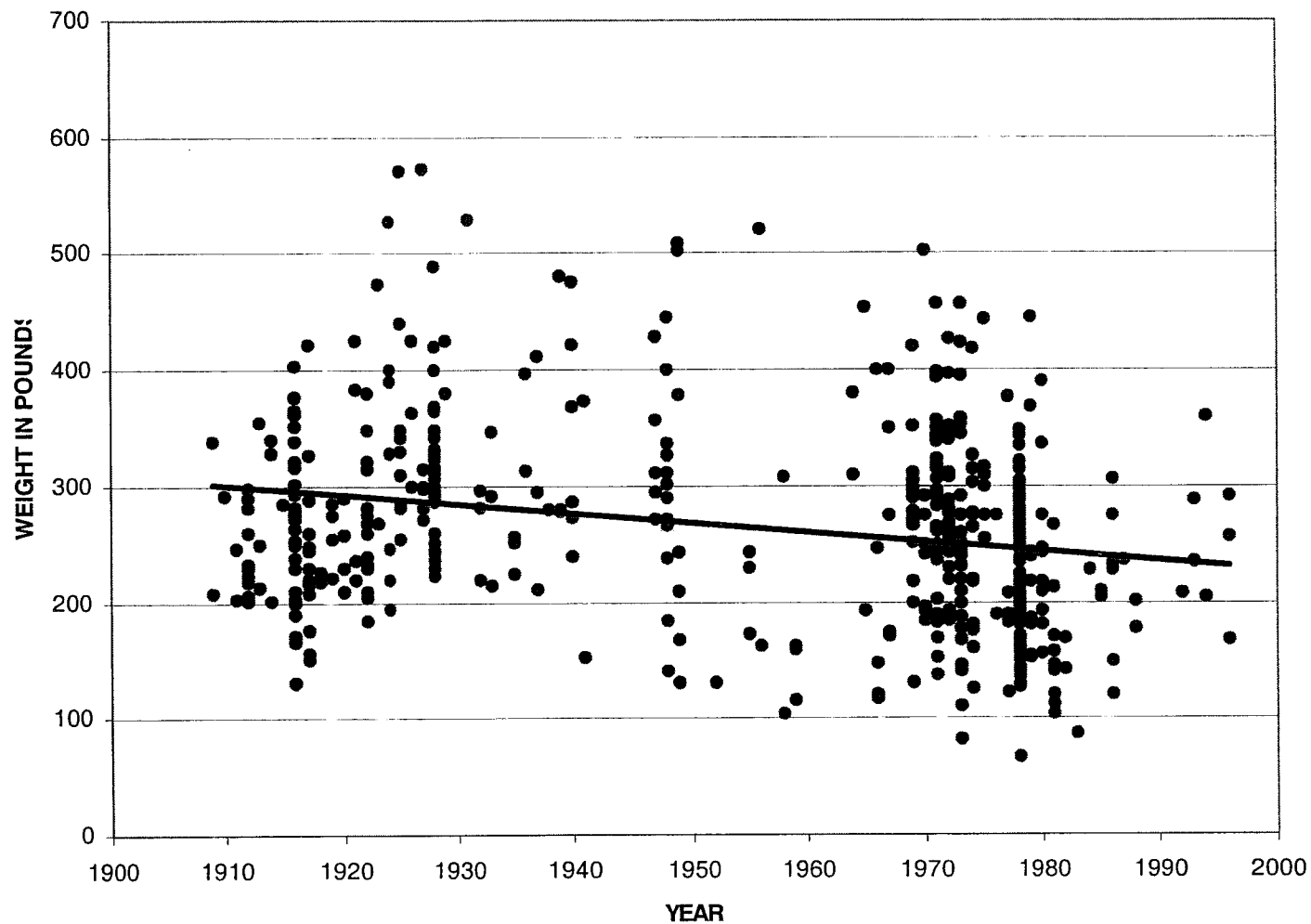


Figure 2-17. Weights of 522 swordfish weighed in at the Tuna Club, Balboa Angling Club, and the San Diego Marlin Club, 1909 - 1996. Data unavailable for some years.

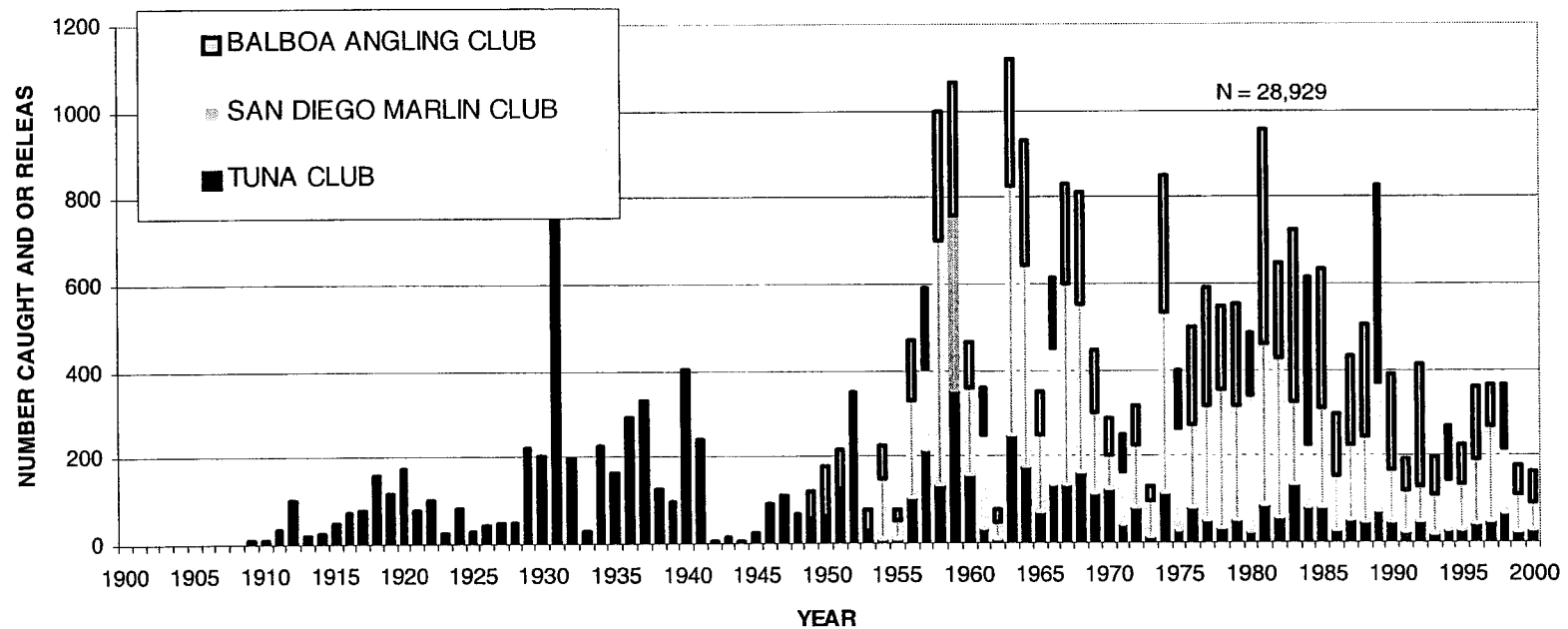


Figure 2-18. Southern California Marlin Catch, for selected angling clubs, 1900 - 2000. (Data unavailable for some years.)

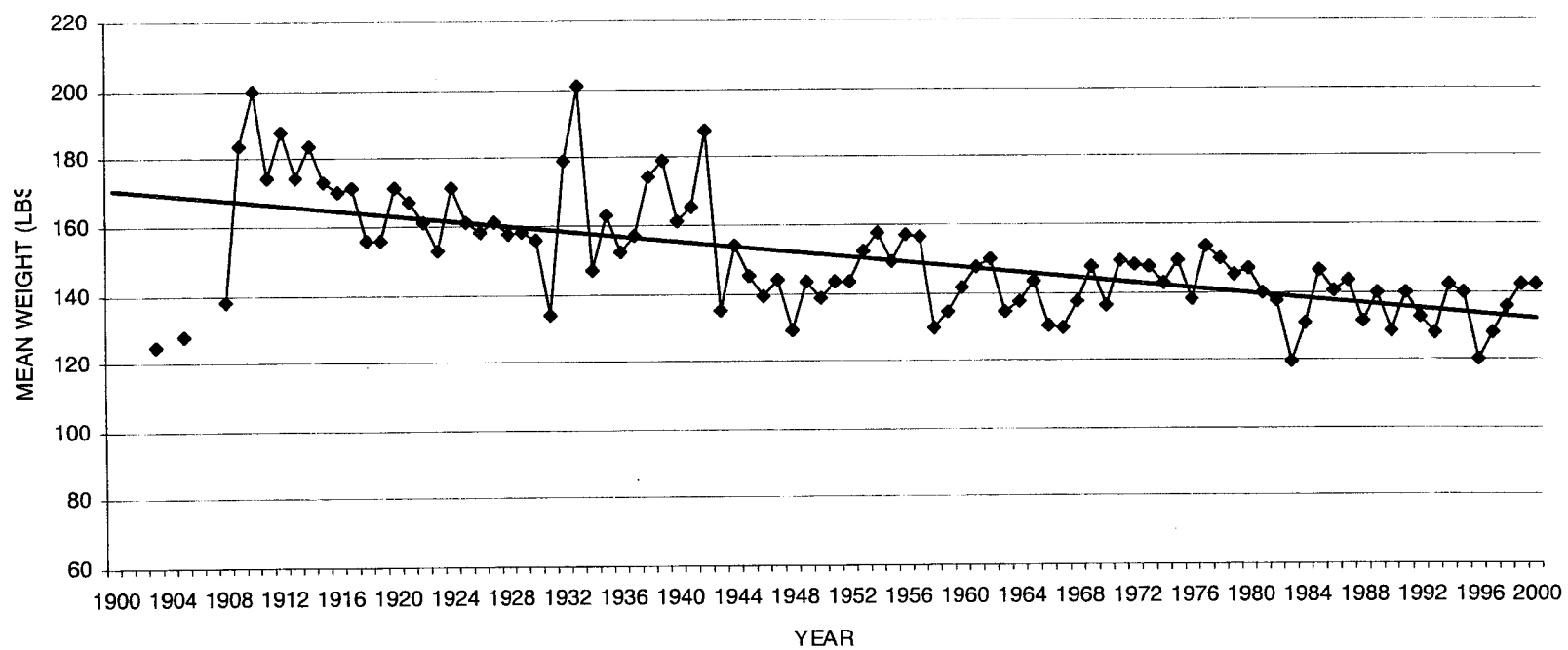


Figure 2-19. Average weight of striped marlin weighed in at selected southern California angling clubs, 1903-1998.

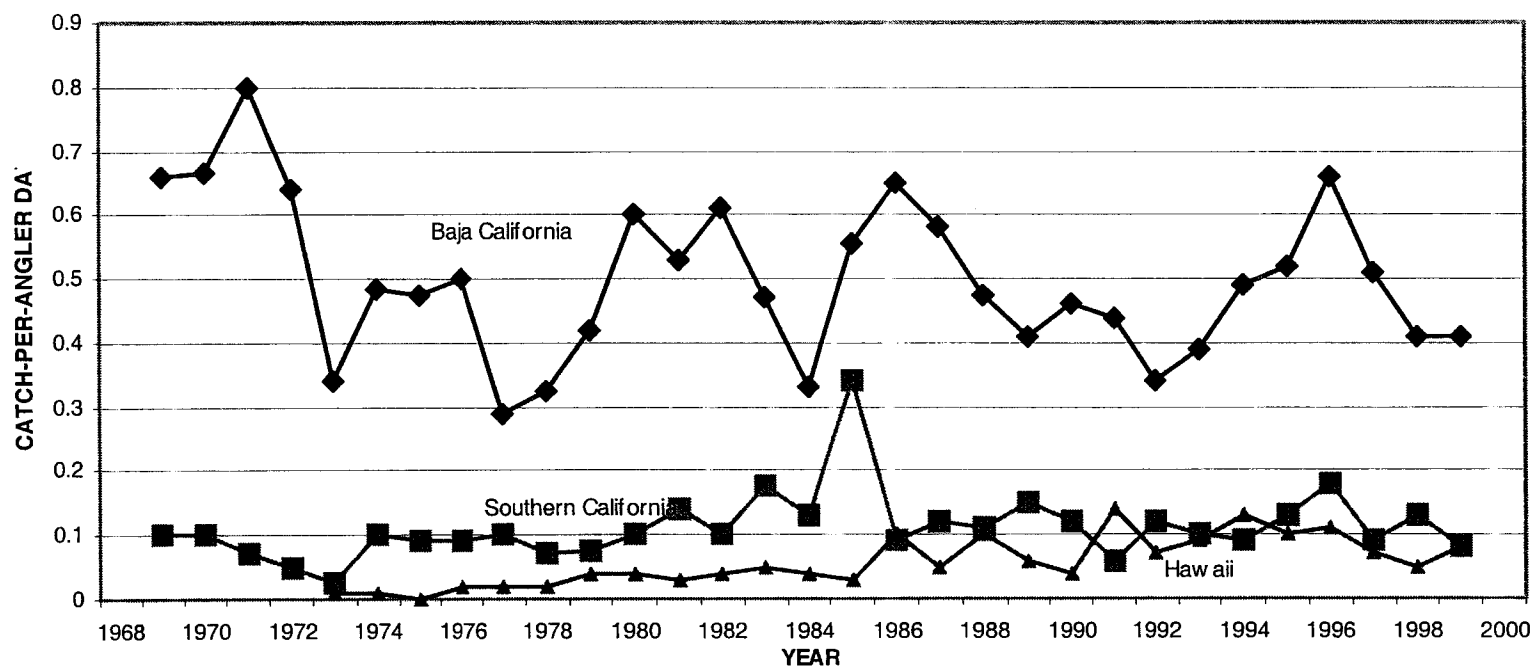


Figure 2-20. Catch rates for striped marlin in southern California, Baja California, and Hawaii, 1968 - 1999

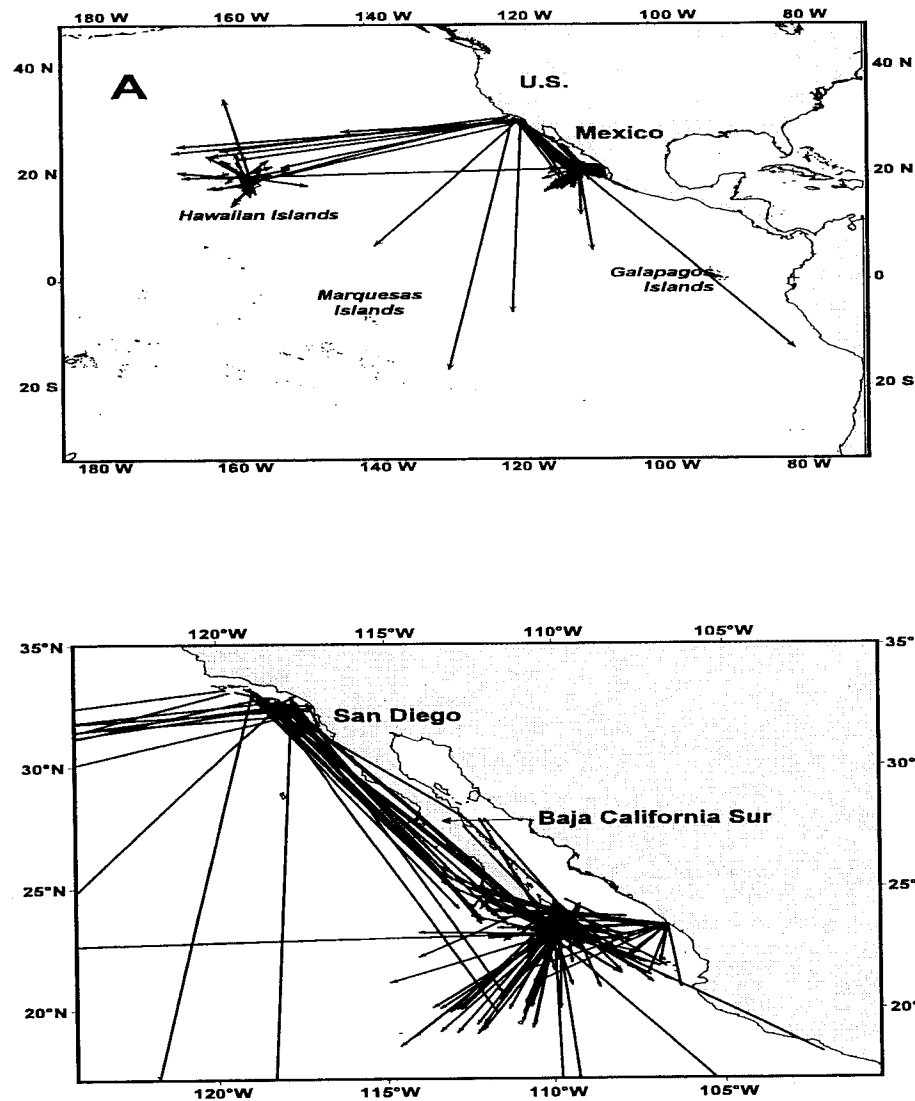


Figure 2-21.

Striped marlin movements from tag recaptures in the north eastern Pacific (A) and detail of returns for southern California and Baja California, Mexico (B). Arrowheads indicate point of recapture and shaft point or release.

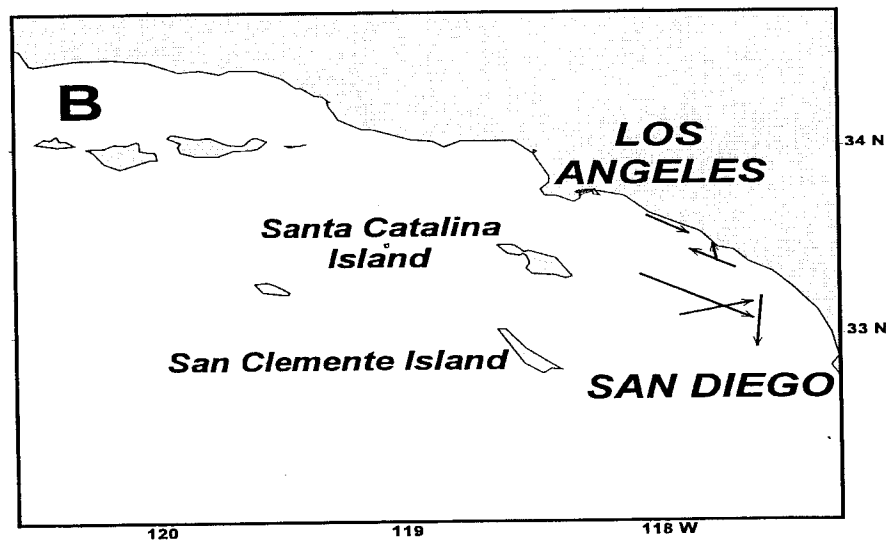
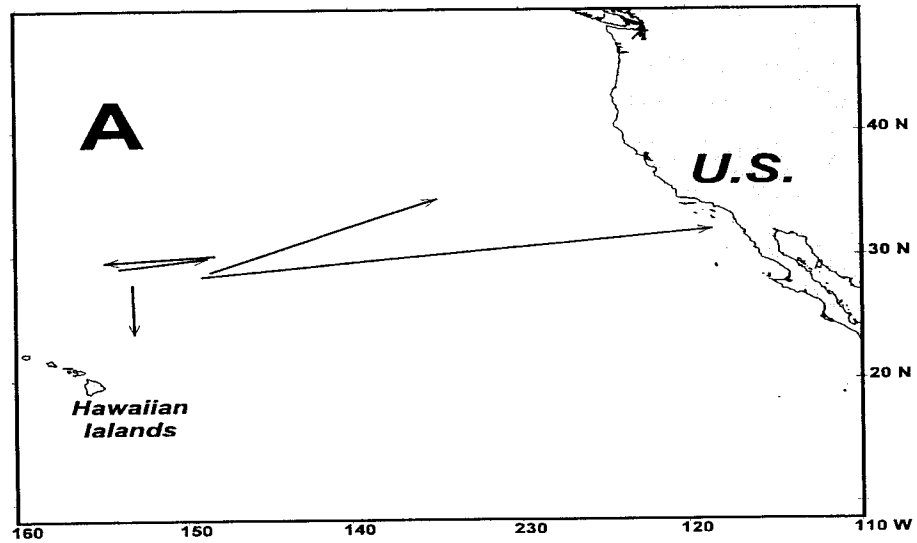


Figure 2-22. Broadbill swordfish movements from tag recaptures in the eastern North Pacific (A) and detail of southern California (B).

Figure 2-23. Number of commercial vessels with HMS landings 1981-99.

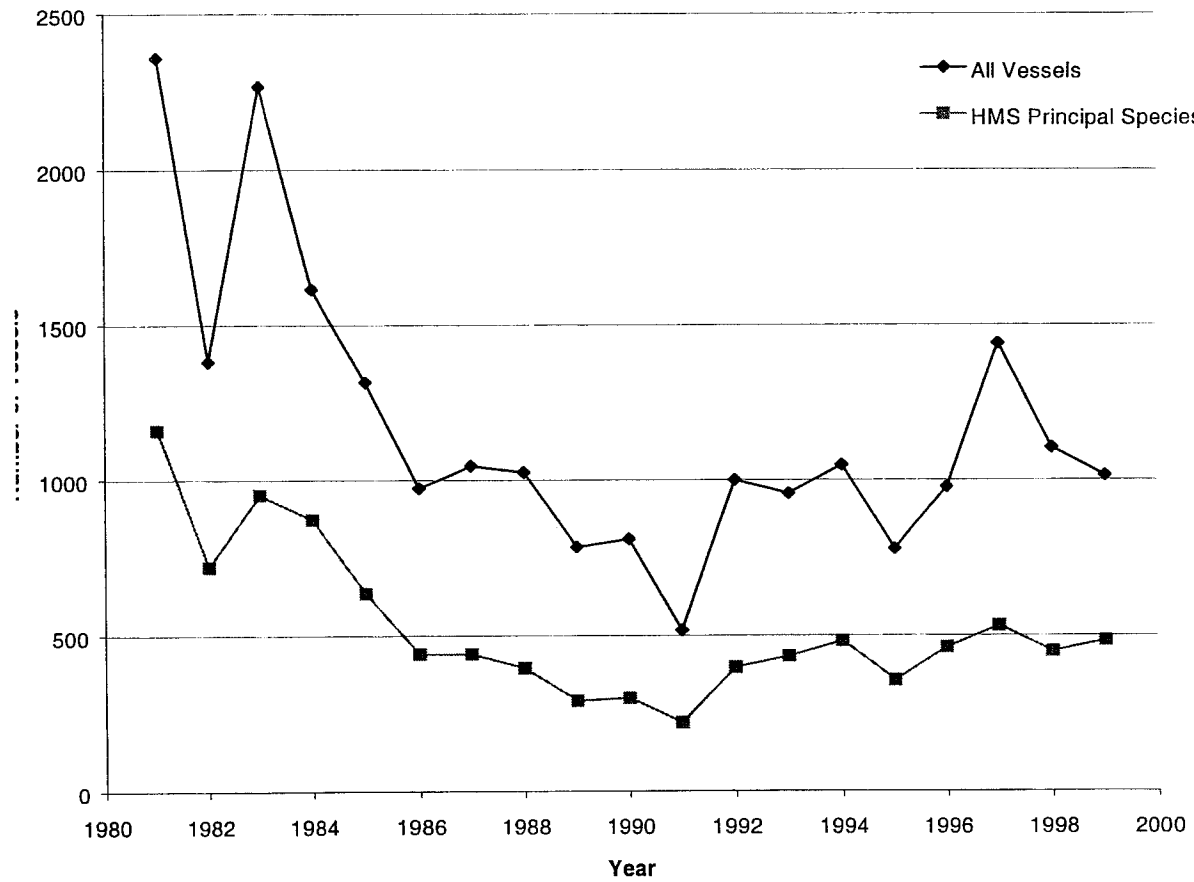


Figure 2-24. Number of HMS landings, 1981-99.

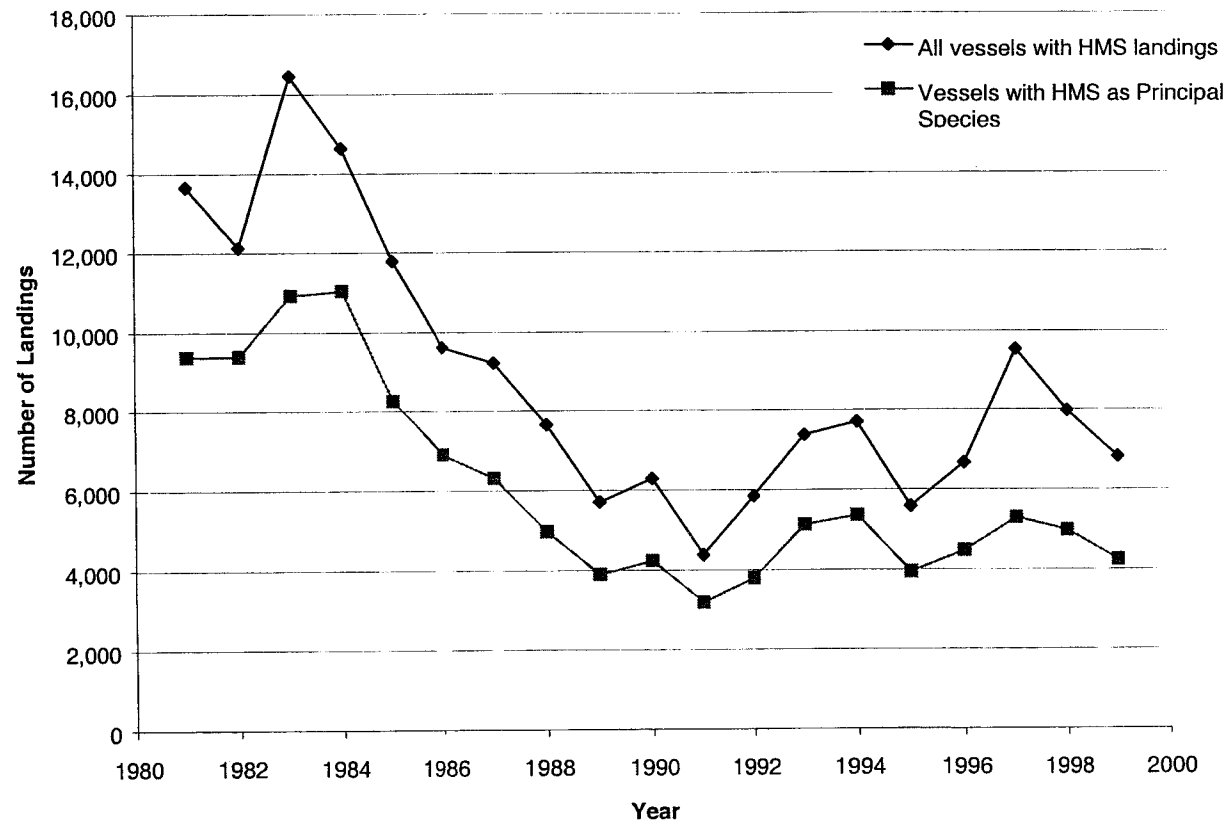


Figure 2-25. HMS landings, 1981-99.

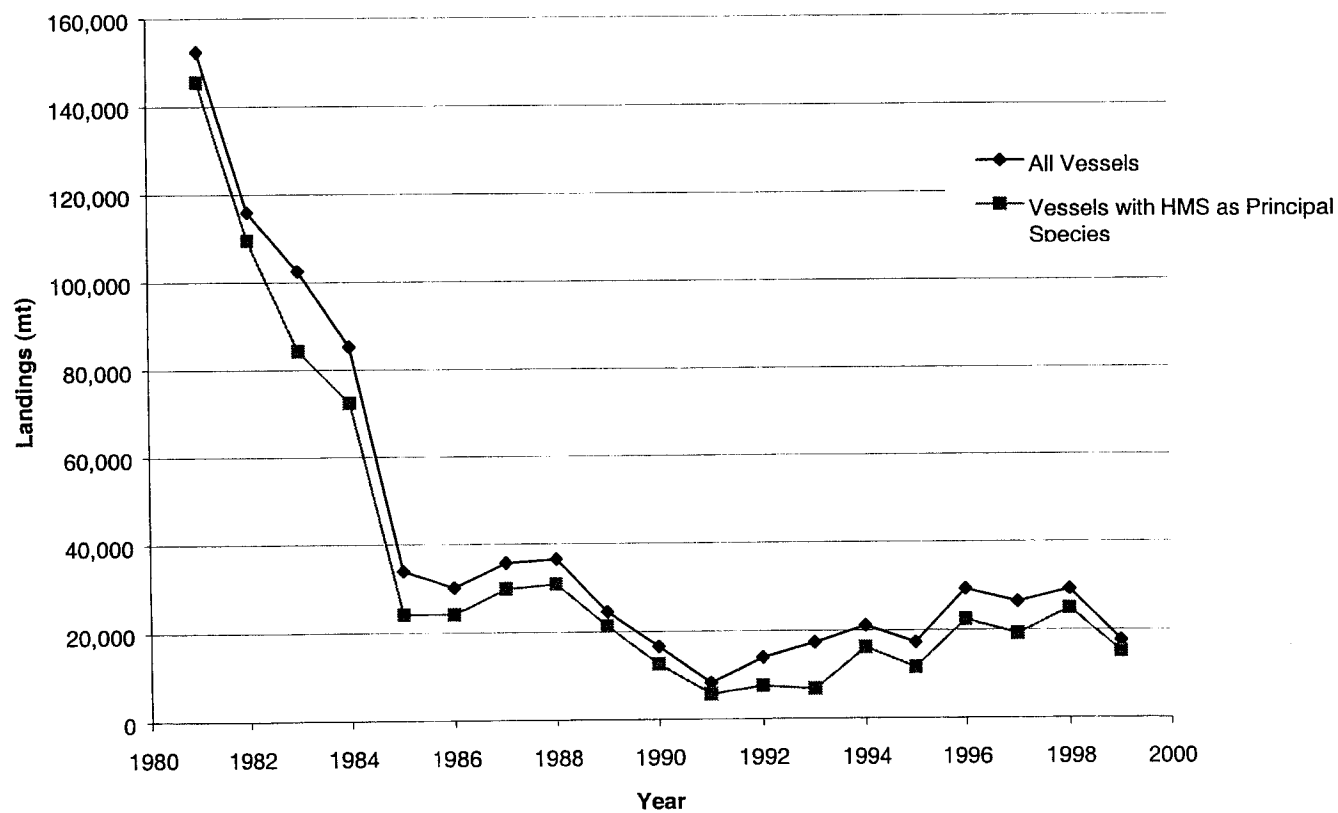


Figure 2-26. Real exvessel HMS revenues (1999 dollars), 1981-99.

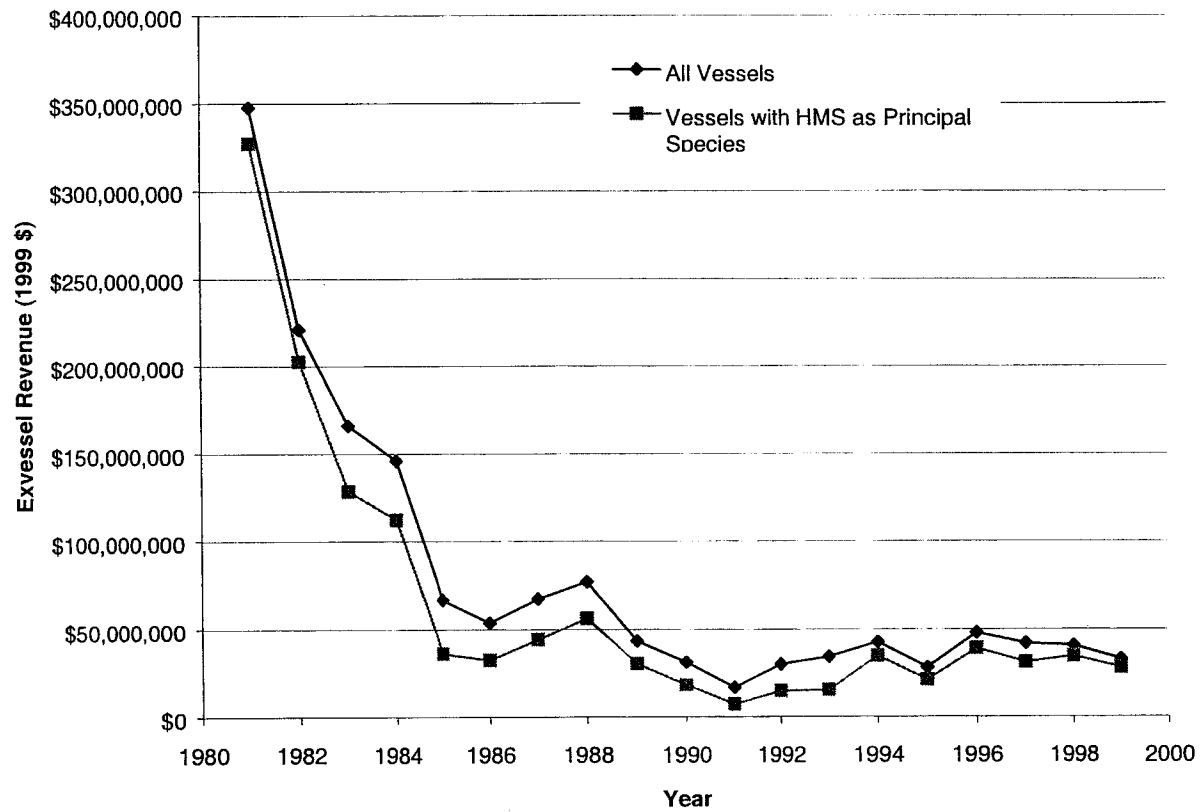


Figure 2-27. Vessel length distribution for vessels whose principal fishery was albacore surface hook-and-line by length category (ft) and selected years.

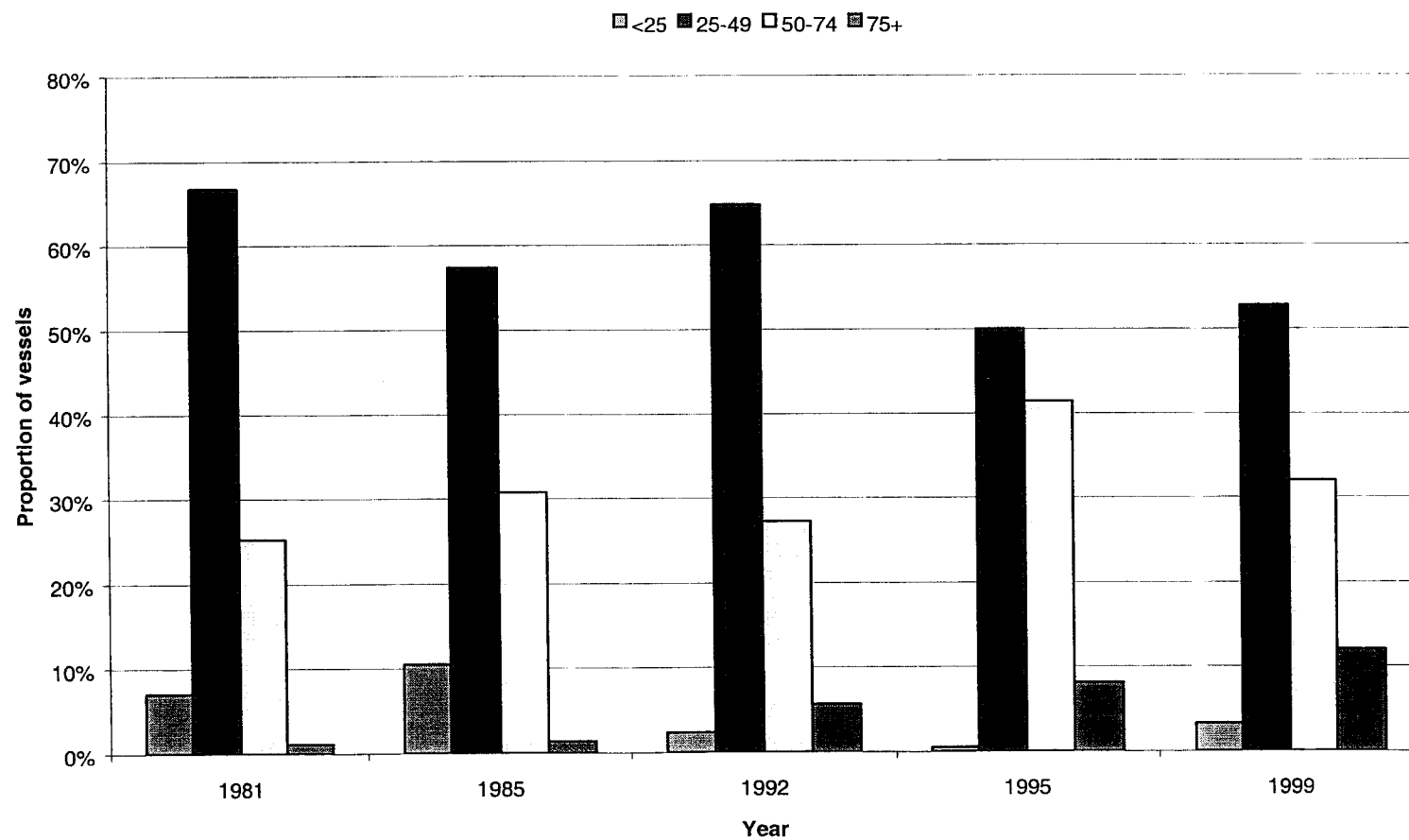


Figure 2-28. Vessel length distribution for vessels whose principal fishery was coastal purse seine by length category (ft) and selected years.

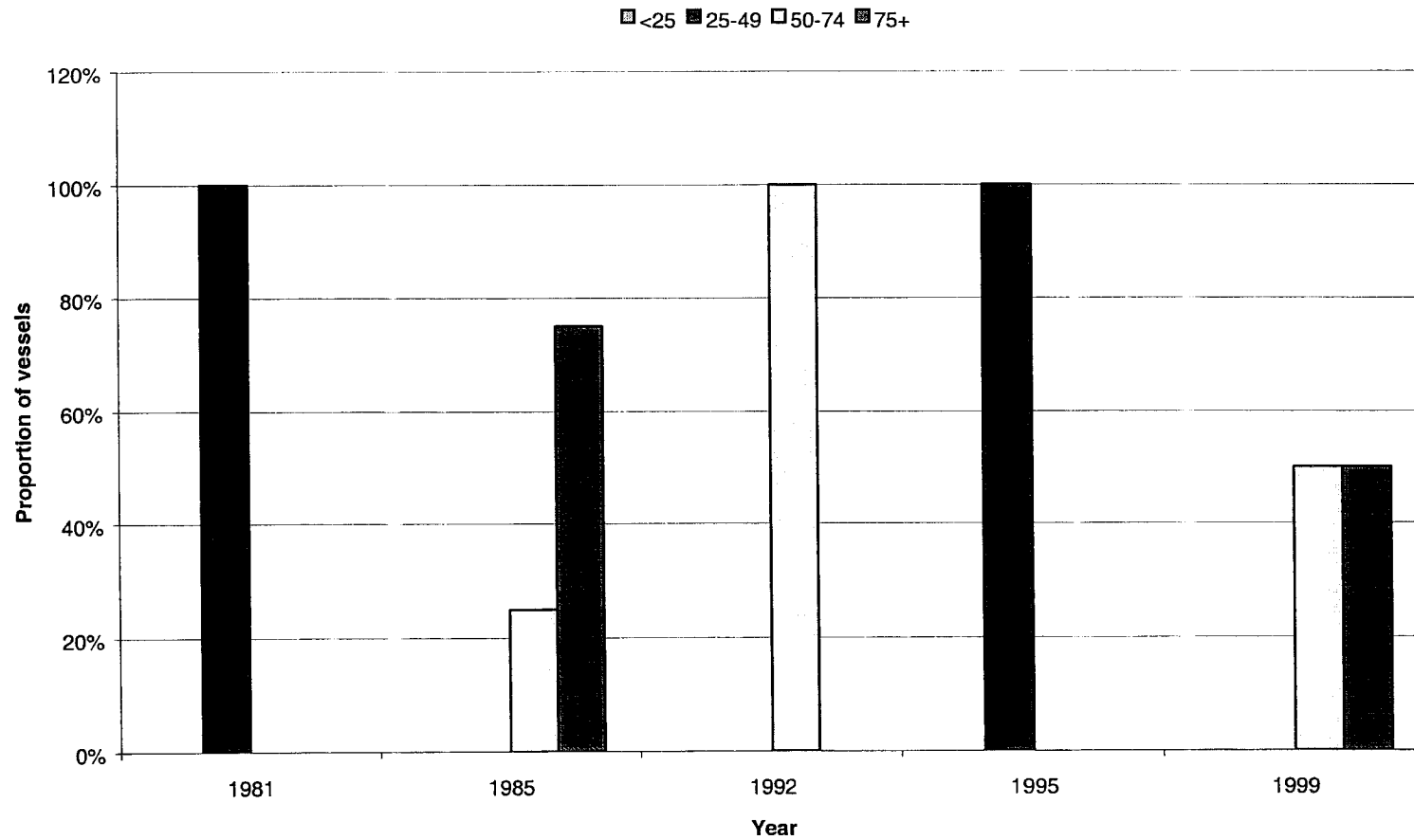


Figure 2-29. Vessel length distribution for vessels whose principal fishery was swordfish and shark drift gillnet by length category (ft) and selected years.

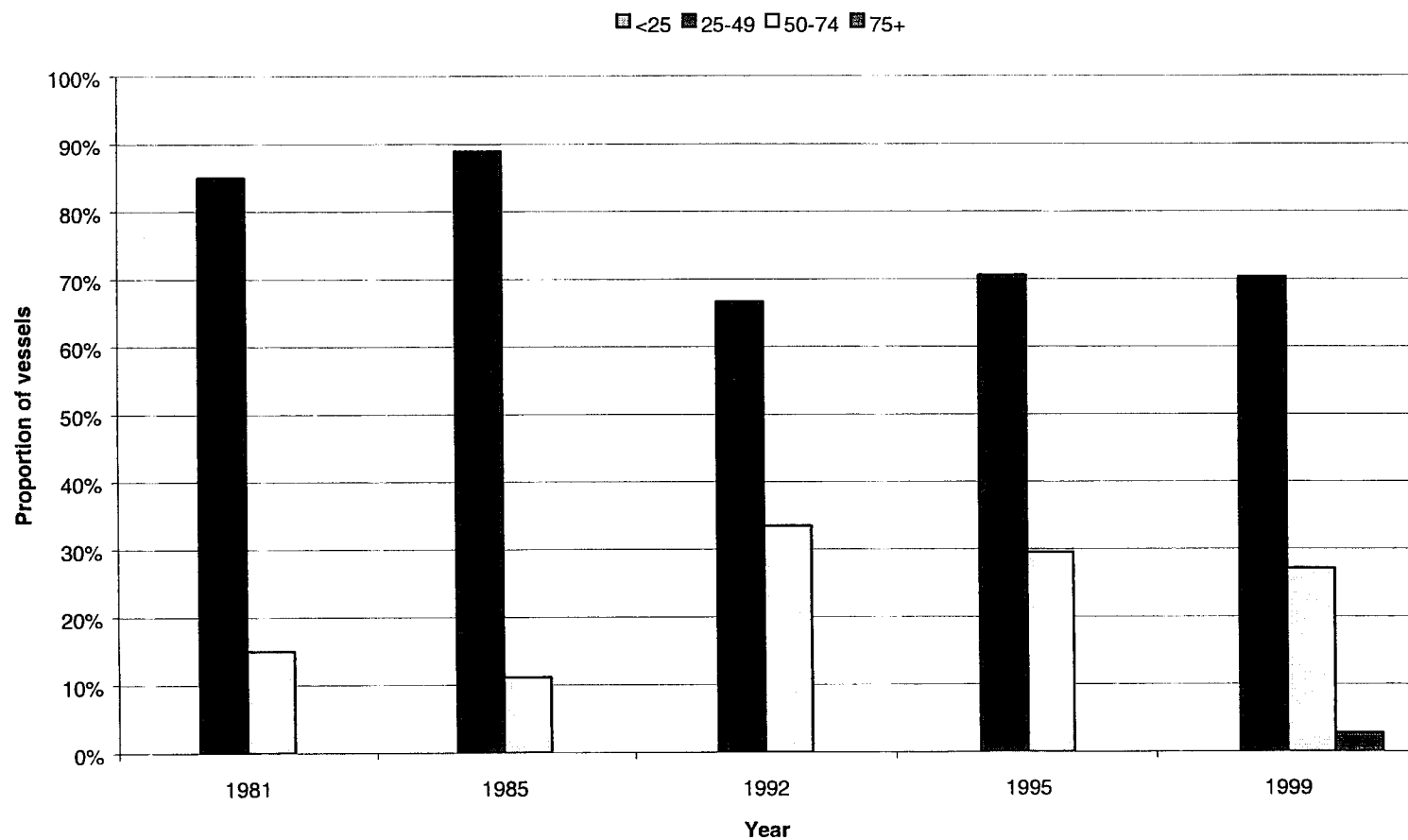


Figure 2-30. Vessel length distribution for vessels whose principal fishery was swordfish harpoon by length category (ft) and selected years.

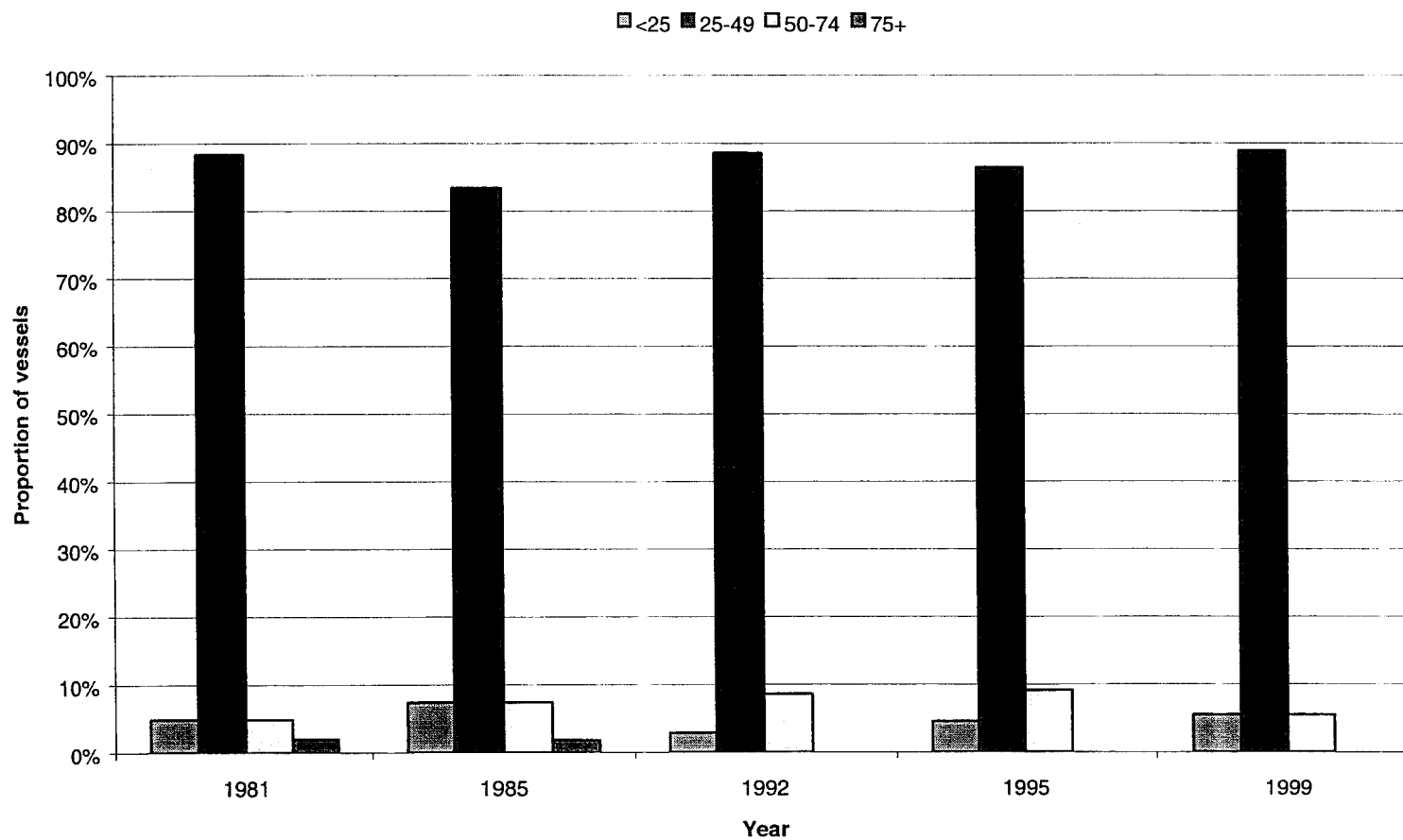


Figure 2-31. Vessel length distribution for vessels whose principal fishery was large purse seine by length category (ft) and selected years.

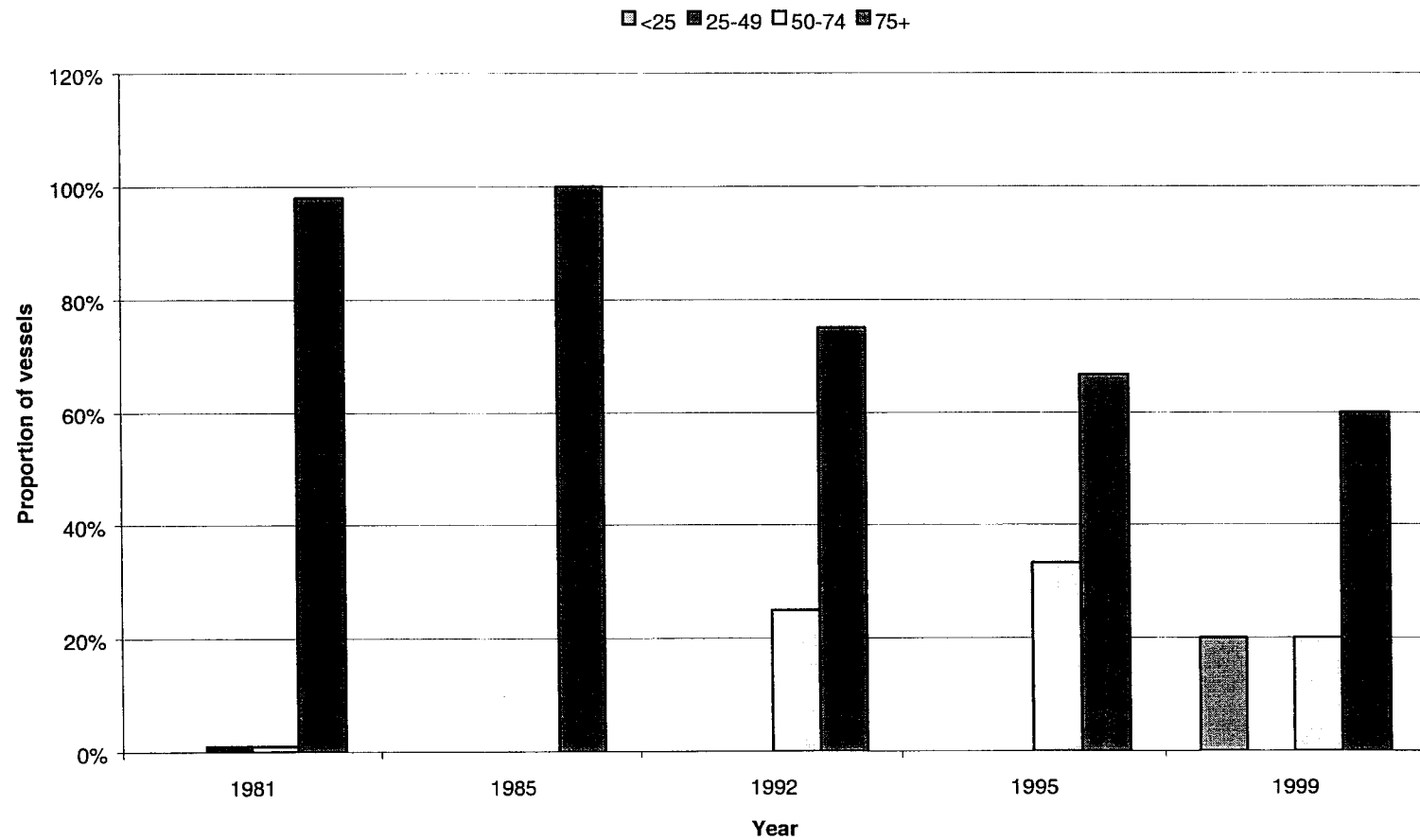


Figure 2-32. Vessel length distribution for vessels whose principal fishery was HMS longline by length category (ft) and selected years.

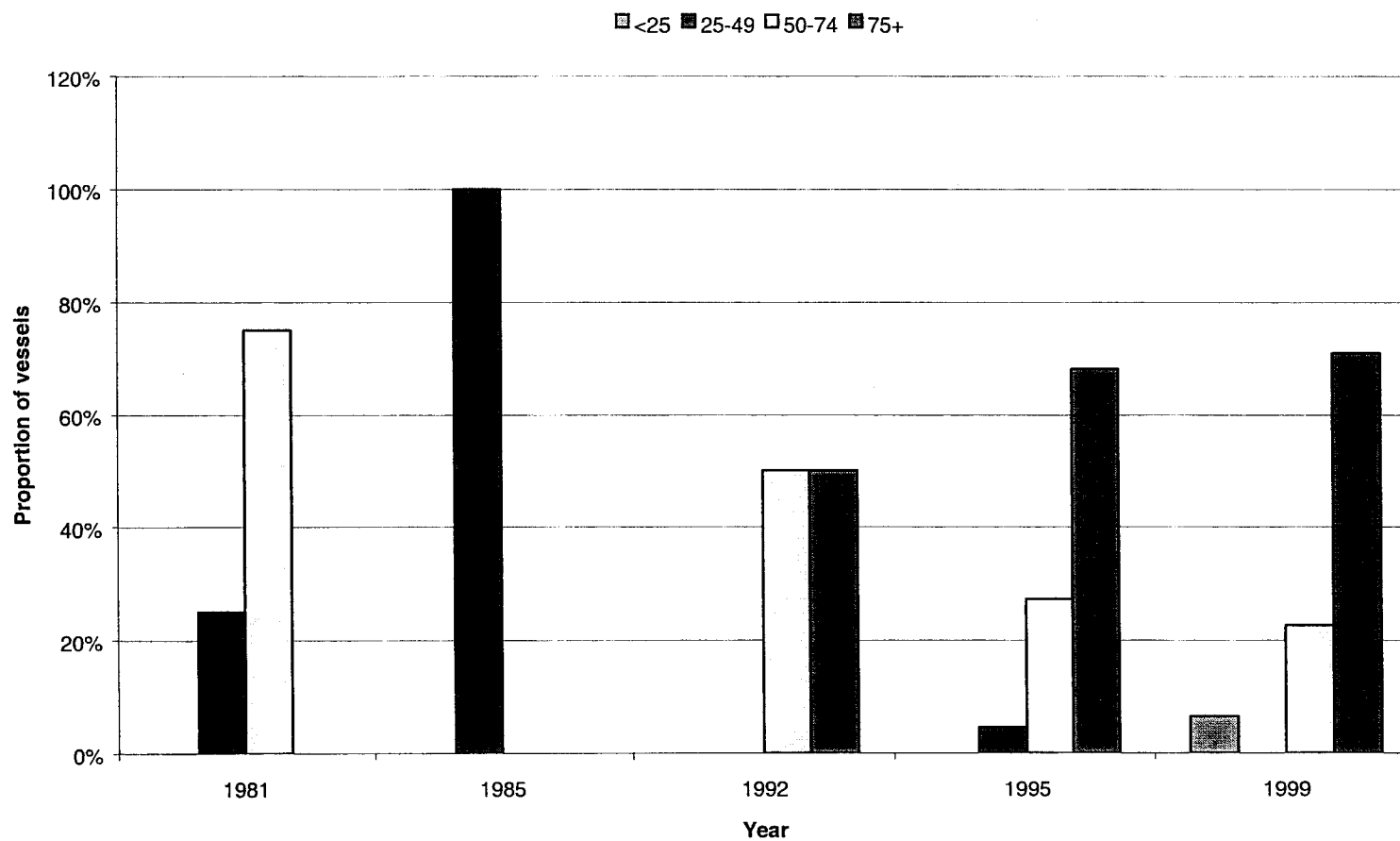


Figure 2-33. Vessel length distribution for vessels whose principal fishery was albacore surface hook-and-line and whose principal port was in Southern California by length category (ft) and selected years.

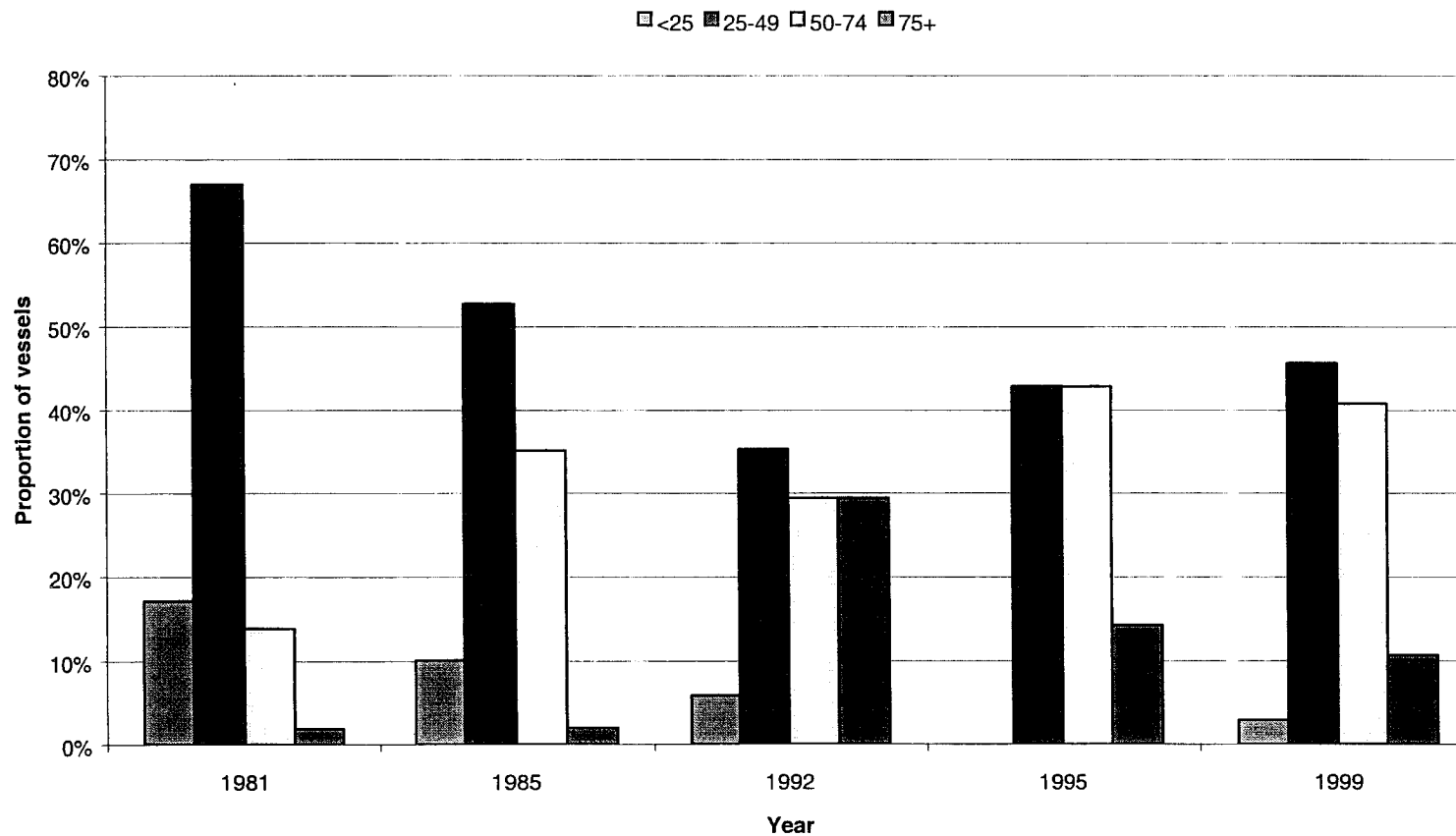


Figure 2-34. Vessel length distribution for vessels whose principal fishery was albacore surface hook-and-line and whose principal port was in Central California by length category (ft) and selected years.

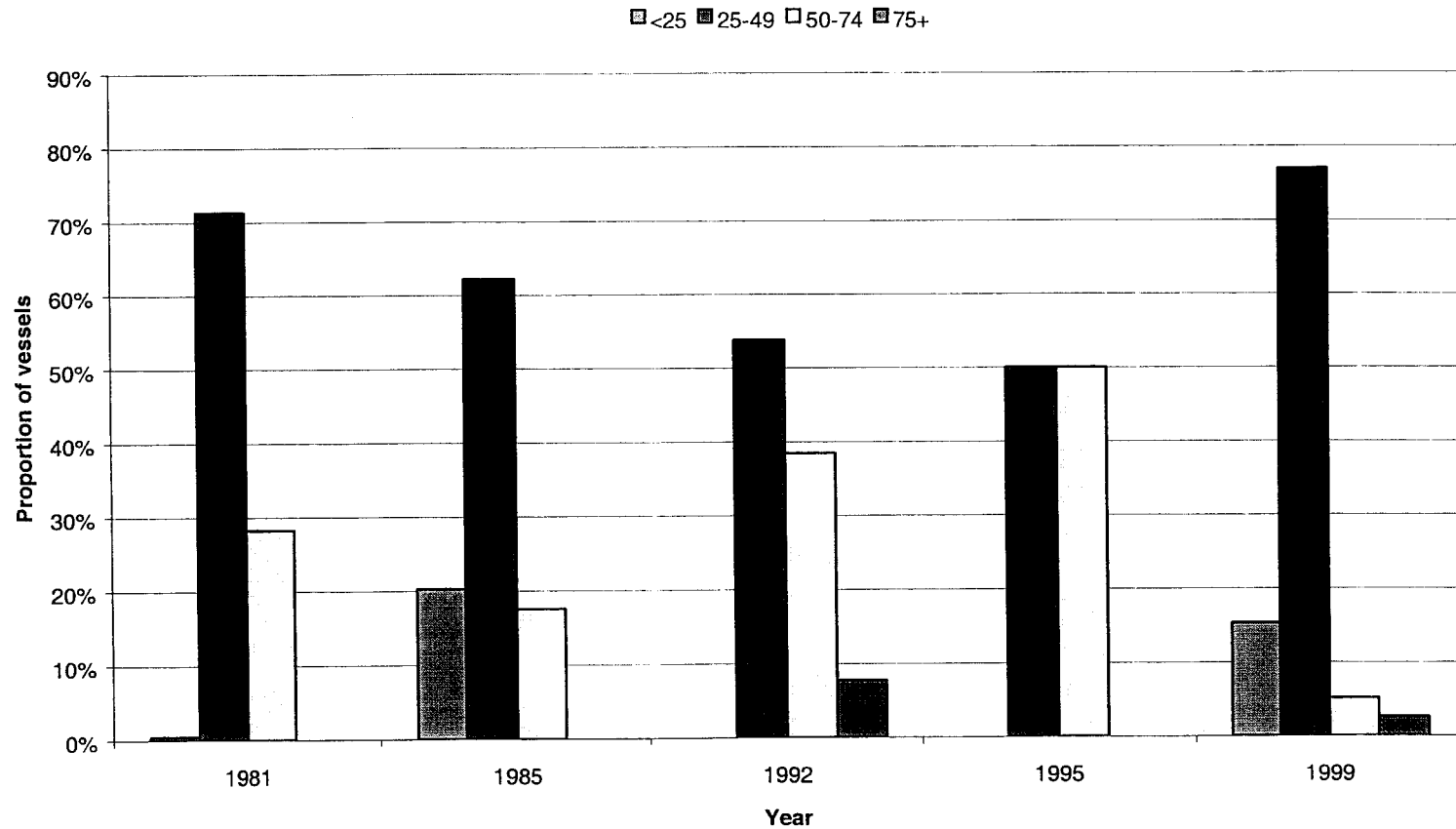


Figure 2-35. Vessel length distribution for vessels whose principal fishery was albacore surface hook-and-line and whose principal port was in Northern California by length category (ft) and selected years.

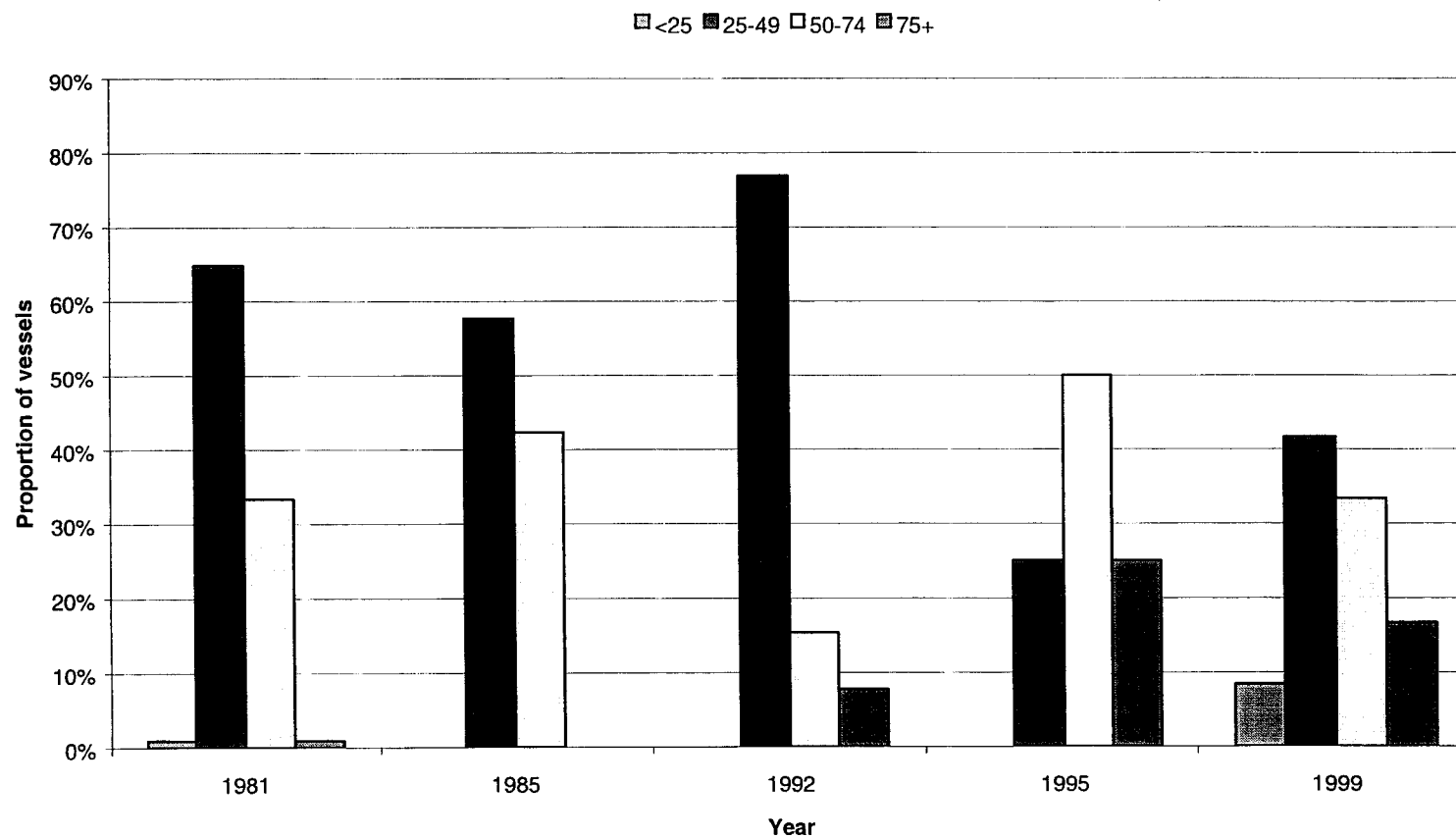


Figure 2-36. Vessel length distribution for vessels whose principal fishery was albacore surface hook-and-line and whose principal port was in Oregon by length category (ft) and selected years.

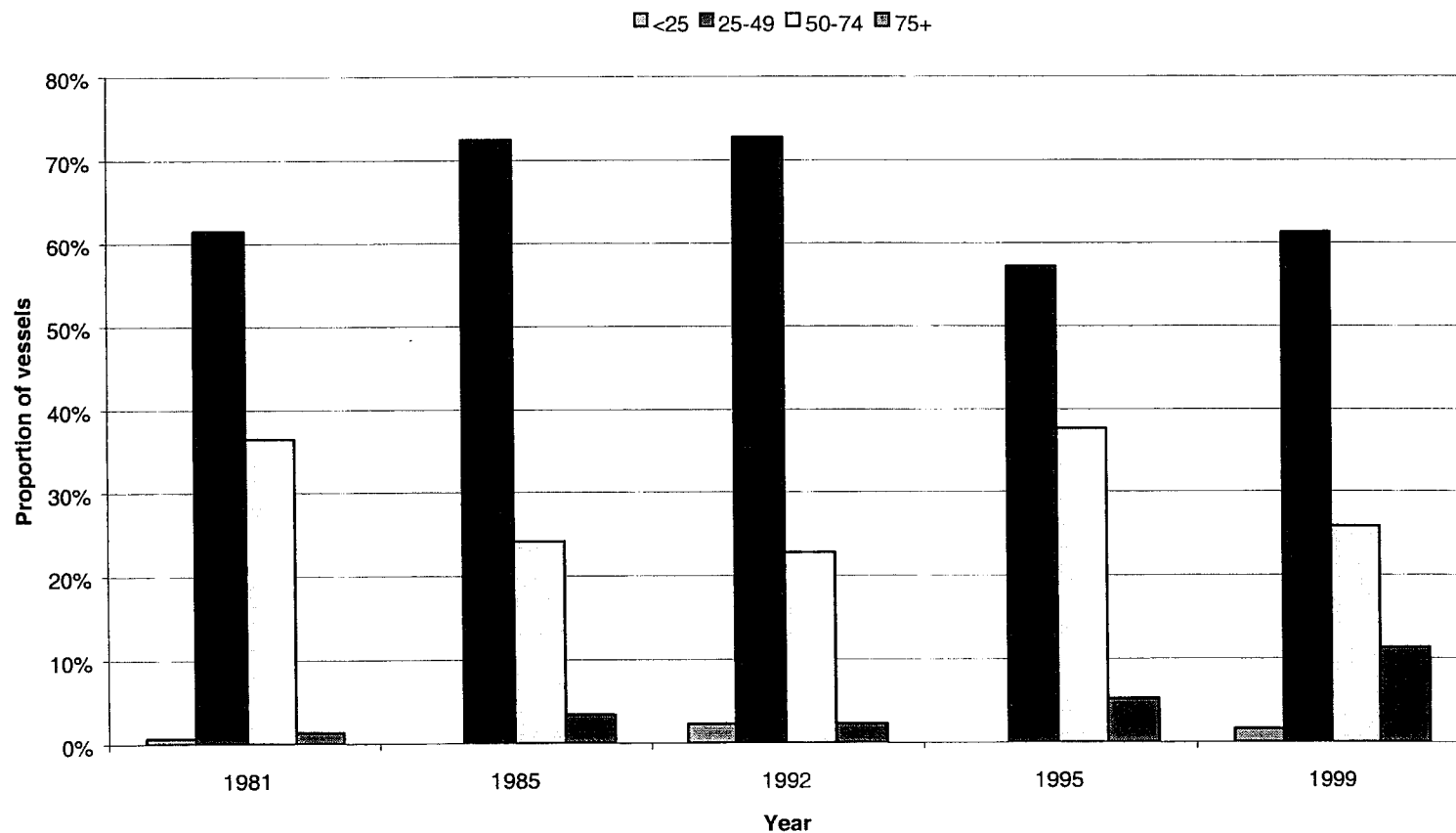


Figure 2-37. Vessel length distribution for vessels whose principal fishery was albacore surface hook-and-line and whose principal port was in Washington by length category (ft) and selected years.

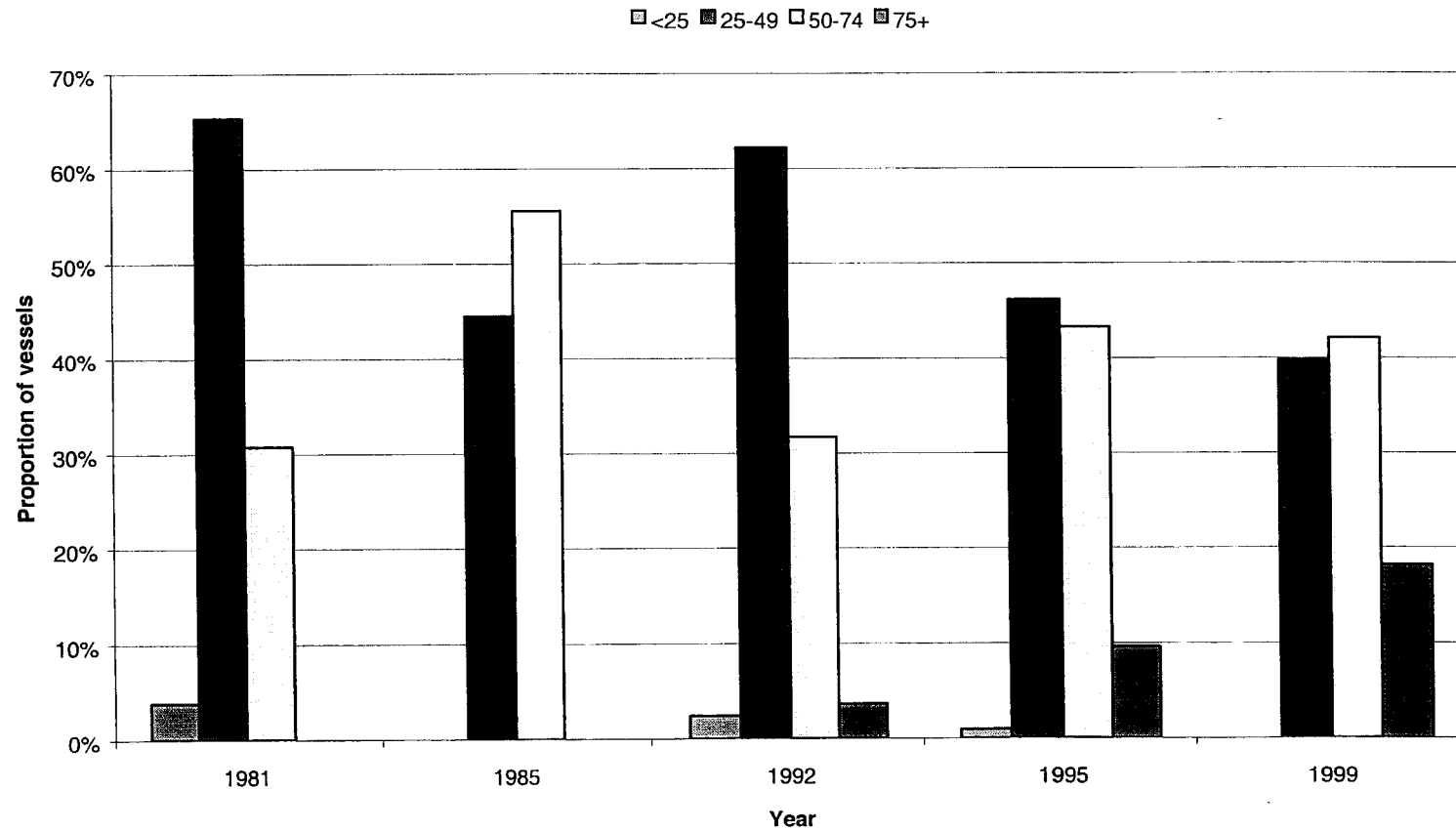


Figure 2-38. Vessel length distribution for vessels whose principal fishery was swordfish and shark drift gillnet and whose principal port was in Southern California by length category (ft) and selected years.

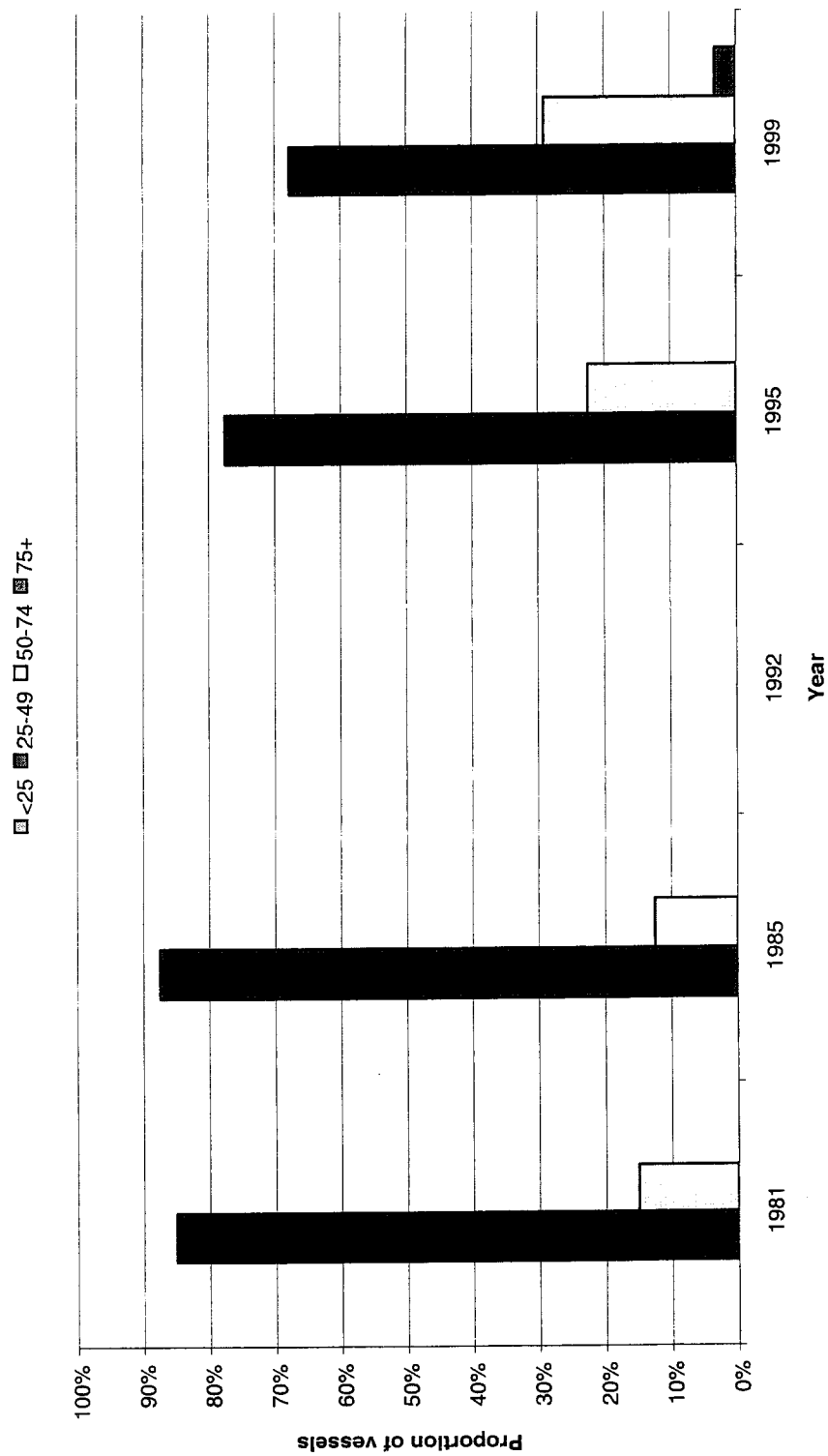


Figure 2-39. Vessel length distribution for vessels whose principal fishery was swordfish and shark drift gillnet and whose principal port was in Central California by length category (ft) and selected years.

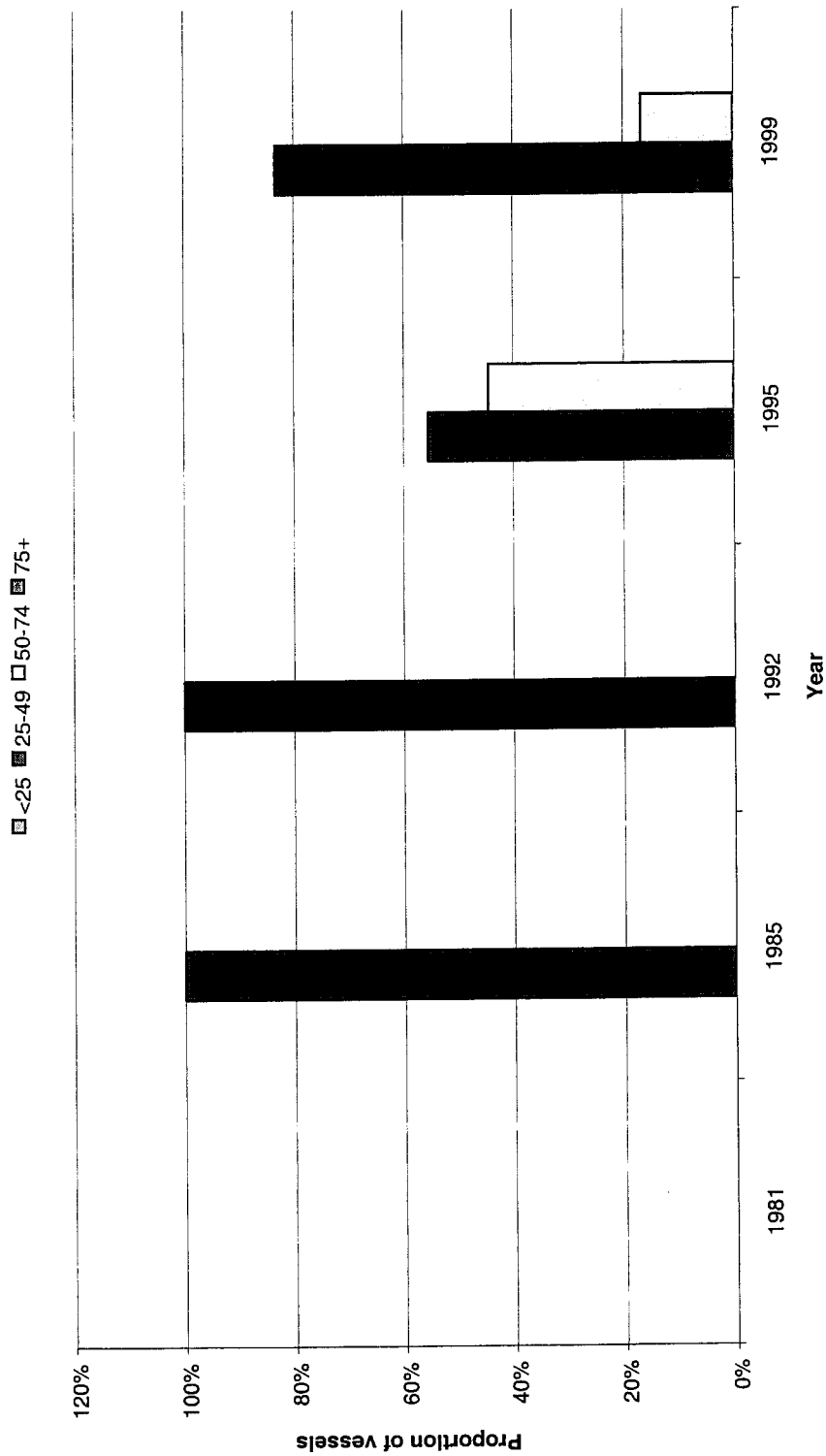


Figure 2-40. Vessel length distribution for vessels whose principal fishery was swordfish and shark drift gillnet and whose principal port was in Northern California by length category (ft) and selected years.

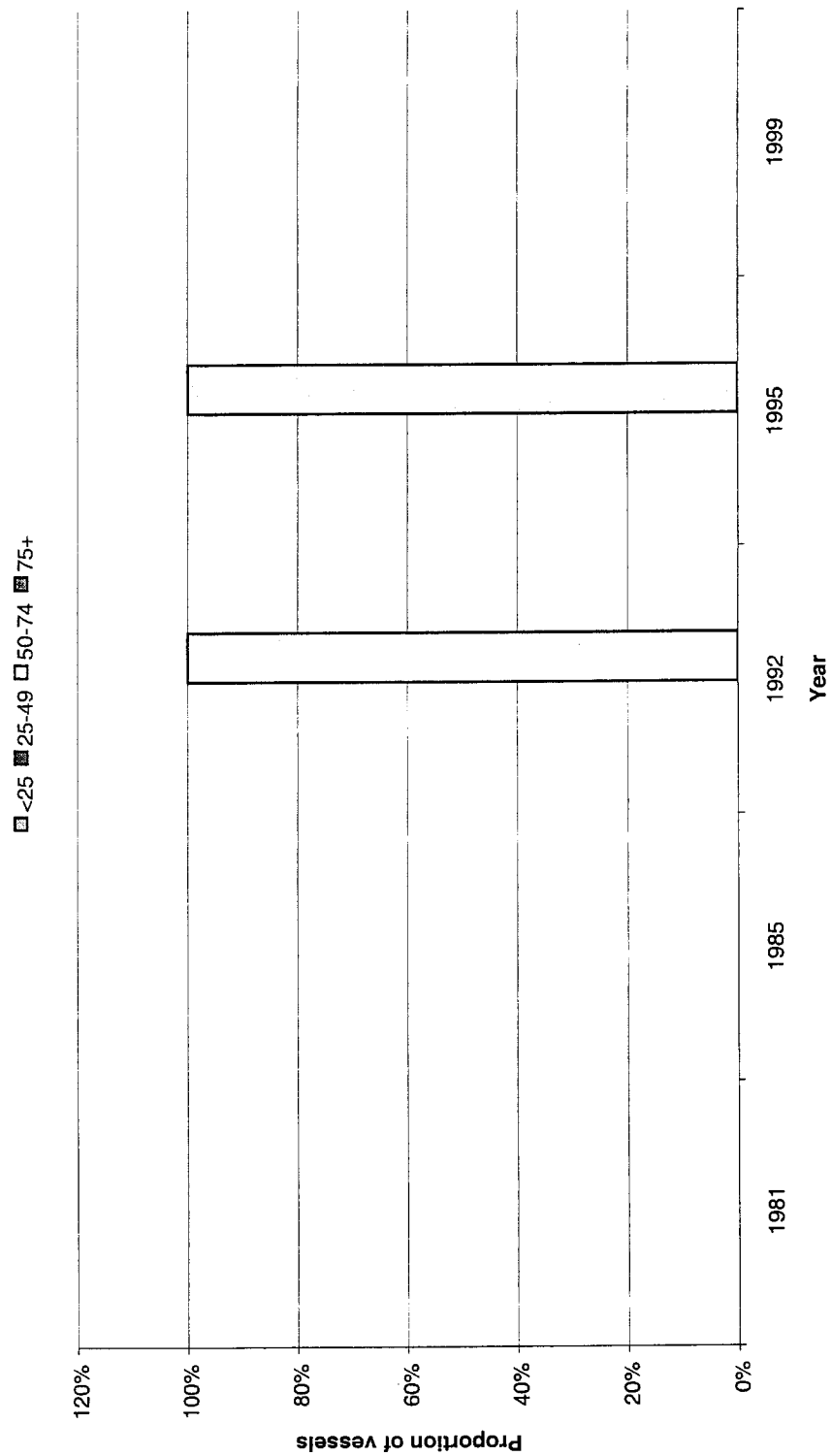
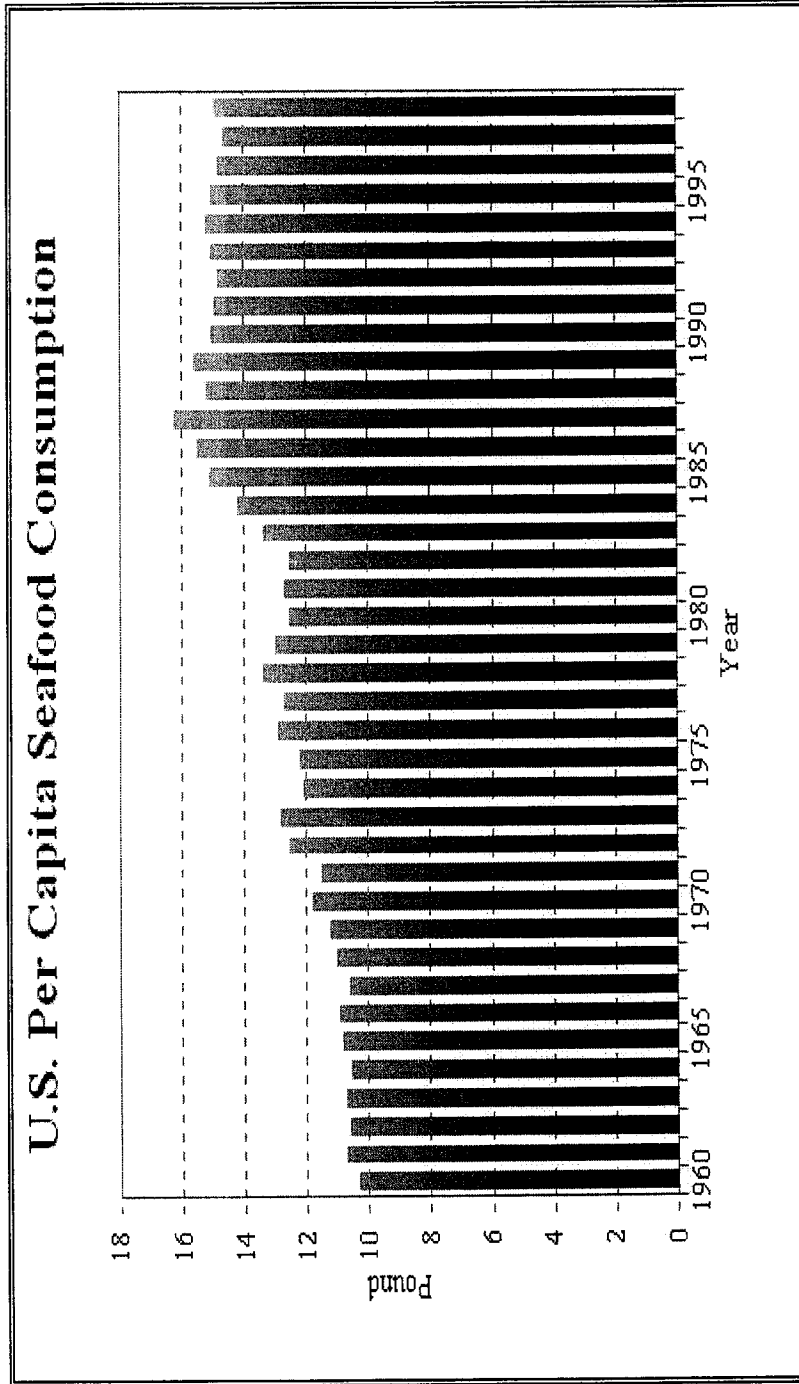


Figure 2-41. U.S. per capita seafood consumption, 1960-99.



Source of Raw Data: National Marine Fisheries Service - Fisheries Statistics and Economics Division
Source of Graph: <http://www.msstate.edu/dept/crec/uspcsc.jpg>