

U.S. Swordfish Fisheries in the North Pacific Ocean¹

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INTRODUCTION

The United States is a major harvesting and consuming nation for swordfish (*Xiphias gladius*). U.S. swordfish fisheries in the Pacific Ocean, Atlantic Ocean and Gulf of Mexico harvested 8,706 metric tons (t) of swordfish in 2000 (Fisheries Statistics Division, 2001). Estimated swordfish landings from U.S. fisheries in the North Pacific were 5,689 t and accounted for approximately 65% of the total U.S. domestic production in 2000.

1. FISHERIES AND CATCHES

Three kinds of gear (longline, drift gill net, and harpoon) are used by U.S. swordfish fisheries in the North Pacific. Longlining is the newest method used. Longlining for swordfish in Hawaii began in 1988 and grew rapidly with landings peaking at 5,909 t in 1993. The Hawaii-based longline fishery was the largest U.S. producer of swordfish in the North Pacific from 1990 through 2000. The California drift gill net fishery, which began in 1980, replaced the harpoon fishery as the dominant swordfish fishery on the U.S. West Coast. Drift gill net landings of swordfish peaked at 2,379 t in 1985. U.S. harpoon fishing for swordfish in the North Pacific has a long history and dates back to the early 1900s (Coan et al., in press). The harpoon fishery in California primarily supplied the local market for swordfish up until the late 1970s. When the market expanded, harpoon landings peaked at 1,699 t in 1978 and have since declined (Fig. 1). For some swordfish landed in California, the method of capture, either harpoon or drift gill net, could not be determined; these landings are listed under "other" fishing gear (Table 1). In some years, the amount of "other" landings was substantial, peaking at 798 t in 1985 and accounting for 27% of the total U.S. North Pacific swordfish catch in 1986.

A lawsuit was filed against NMFS by Earthjustice Legal Defense Fund against in a U.S. District Court in February, 1999, due to interactions between the Hawaii-based longline fishery and sea turtles. The lawsuit was on behalf of two non-government organizations, the Center for Marine Conservation (now called the Ocean Conservancy) and the Turtle Island Restoration

Network. During the course of the litigation, several interim regulations were imposed by the Court to restrict fishing by Hawaii-based longline vessels, particularly those targeting swordfish, with the intention of reducing interactions with sea turtles while an Environmental Impact Statement (EIS) for the longline was being prepared. The interim regulations that had the greatest impact on swordfish-directed effort were: 1) on December 27, 1999, closing prime swordfish fishing grounds north of the main Hawaiian Islands, and 2) on June 23, 2000, placing an upper limit the number of swordfish-directed longline sets. After NMFS issued a Biological Opinion on the fishery and published the final EIS on March 31, 2001, the Court issued an order prohibiting Hawaii-based longline vessels from targeting swordfish (fishing with deep-set "swordfish style" gear) north of the equator. NMFS has implemented a number of regulations to comply with the court order. To avoid these new restrictions, many of the Hawaii-based longline vessels that targeted swordfish relinquished their federal limited entry permits and relocated to California to continue fishing for swordfish. As a consequence, there was growth in the effort and swordfish catch experienced in California in 1999 and 2000.

Hawaii-Based Longline Fishery

The number of Hawaii-based longline vessels increased rapidly in the late 1980s and early 1990's as U.S. longliners from the Gulf of Mexico and the Atlantic swordfish fisheries joined the Hawaii-based longline fishery. Swordfish longline techniques from the Atlantic Ocean were introduced to Hawaii by this group of fishermen and helped establish Hawaii as a major producer of swordfish.

Longline gear is composed of a single, continuous mainline with floats attached to the mainline supporting the gear horizontally in the water column. Branchlines with baited hooks are attached to the mainline between the floats. There are two basic techniques used when vessel operators target either tunas or swordfish. The technique used to target swordfish does not employ the use of a line thrower because the gear is set relatively shallow. Vessels targeting swordfish typically set longline gear in the evening, attach 2-5 hooks between floats, use squid for bait, attach chemical lightsticks to the branchlines, and haul gear the following morning. The other technique, used to target tunas, requires a line thrower, which sets the longline with a sag between floats. Vessels targeting tunas usually set the longline gear in the morning with 15-30 or more hooks between floats, use sanma for bait, use no lightsticks, and haul gear in the afternoon.

The number of active Hawaii-based longline vessels rose from 37 vessels in 1987 and peaked at 141 vessels in 1991 (Fig. 2). In light of this rapid expansion, a federal moratorium implemented in 1991 limited the number of longline permits to 167. Some longline vessels during this time fished exclusively for swordfish throughout the entire year, but activity directed towards swordfish has since declined. The moratorium on permits was replaced with a limited entry program in 1994 which capped participation in Hawaii's longline fishery at 164 vessels. There were 125 active longline vessels in 2000, of which 57 vessels indicated that they had targeted swordfish as their primary or secondary target. The Hawaii-based longline fleet now targets tunas exclusively.

The Hawaii-based longline fishery was the largest producer of swordfish of all the U.S. North Pacific swordfish fisheries from 1990 through 2000. Swordfish landings² from this fishery began to increase in 1989 when a few vessels successfully targeted swordfish off Hawaii. Swordfish landings increased rapidly, peaking at 5,909 t in 1993, and dropped to 3,176 t the following year. Swordfish landings by the Hawaii-based longline fishery ranged from 2,502 t to 3,263 t throughout 1994-2000, with swordfish landings at 2,949 t in 2000 (Table 1). Although there was a substantial decrease in swordfish landings after 1993, swordfish was still a major component of the total Hawaii longline landings. Landings of swordfish by the Hawaii-based longline fishery is expected to decrease significantly due to the prohibition on shallow sets. Other species caught by the Hawaii-based longline fishery included sharks, primarily blue sharks (*Prionace glauca*), bigeye tuna (*Thunnus obesus*), albacore (*T. alalunga*), yellowfin tuna (*T. albacares*), bluefin tuna (*T. thynnus orientalis*), marlins (Istiophoridae), mahimahi (*Coryphaena hippurus*), moonfish (*Lampris guttatus*), ono (*Acanthocybium solandri*), and oilfish (Gempylidae).

Swordfish CPUE (number of fish per 1,000 hooks) varied substantially depending on targeting practice (Fig. 3). Swordfish CPUE for trips that specifically targeted swordfish was 15.4 fish in 1991, dropped to 10.3 fish in 1994, and increased to 15.4 fish in 1997. Swordfish CPUE was 14.5 in 2000. Tuna-targeted trips had the lowest swordfish CPUE while mixed target trips had intermediate swordfish CPUE throughout 1991-2000³. Swordfish-targeted trips usually had the highest swordfish CPUE during the first and second quarters and lowest CPUE in the third quarter.

California-Based Longline Fishery

The California-based longline fishery began in 1991 when 3 vessels based in San Pedro fished waters outside the U.S. EEZ (Vojkovich and Barsky, 1998). The longline fleet increased substantially to 31 vessels in 1994. Participation in the California-based longline fishery peaked at 40 vessels in 2000 (Fig. 4). The California-based longline fleet is composed predominantly of vessels that targeted swordfish in Hawaii and migrated to California as a result of the turtle interaction lawsuit. The configuration of longline gear in the California-based longline fishery is the same as described for the Hawaii-based longline fishery.

Incidental catches in the California-based longline fishery include: sharks, yellowfin tuna, bluefin tuna, bigeye tuna, albacore, mahimahi, moonfish, oilfish. Marlins are also caught but California Department of Fish and Game (CDFG) regulations prohibit landing these species caught with longline gear. Although interactions with marine mammals, birds, and turtles are seldom reported in logbooks submitted by fishermen, there is some evidence that these species are also caught incidentally.

²Swordfish landings are based on estimated whole weight. The conversion factor for processed swordfish (typically landed without head, guts, and tail) was 1.45.

³Hawaii-based longline trips are categorized as swordfish, tuna, and mixed based on targeting information provided by vessel captains or by operational characteristics.

Swordfish landings by the California-based longline fishery have increased dramatically in the past two years. The California-based longline fishery was the second largest U.S. swordfish producer in the North Pacific in 1999 and 2000. The landings of swordfish by the California-based longline fishery peaked at 1,918 t in 2000 (Table 1).

California-based longline CPUE (fish per 1000 hooks) varied substantially and ranged from 6.3 fish to 22.1 fish throughout 1994-2000 (Fig. 5). Preliminary CPUE longline CPUE was 11.0 fish in 2000. Longline effort typically increases during the last quarter of each the year.

California Drift Gill Net Fishery

The California drift gill net fishery for sharks (thresher shark, *Alopias vulpinus*, and shortfin mako shark, *Isurus oxyrinchus*) and swordfish developed in the late 1970s (Hanan et al., 1993). The fishery was originally directed toward sharks, but changed in the early 1980s when regulations allowed for greater landings of swordfish. Incidental catches include tunas and other pelagic fish. Interactions with marine mammals and turtles also occur in this fishery (Herrick and Hanan 1988). The number of active drift gill net vessels peaked at 220 during 1985-86 and decreased to 78 vessels during 1999-2000 (Fig. 6). CDFG currently limits the participants in the fishery to 150 permitted vessels.

Drift gill nets used in this fishery are made of 3-strand twisted nylon with 33-48 cm mesh size (Hanan et al., 1993). They range in length from 1.5-1.8 km long and are set 5.5-7.9 m below the surface. The nets are set in the evenings and pulled before sunrise. The drift gill net fishery begins in May of one year and continues until March or April of the next year, but the peak swordfish catches usually occur in October and November. Fishing is concentrated in the Southern California Bight (waters off Point Conception down to the Mexico) but can extend past San Francisco and the San Clemente Islands as far north as Oregon, with swordfish caught primarily within 200 miles of shore.

Swordfish landings by the drift gill net fishery grew from 160 t in 1980 and peaked at 2,379 t in 1985. Swordfish landings by the drift gill net fishery declined to 584 t in 1999 and increased to 681 t in 2000 (Table 1).

Drift gill net CPUE rose from 0.6 swordfish per set in 1981-82 and peaked at 2.7 swordfish per set in the 1984-85 season (Fig. 7). Drift gill net CPUE ranged between 1.5 fish and 2.7 thereafter with CPUE at 1.8 fish in 1999-2000.

California Harpoon Fishery

The California harpoon fishery started in the early 1900s. The number of harpoon vessels peaked at 309 in 1978 (Fig. 8). Participation dropped below 200 vessels in the early 1980s and continued to decline into the late 1990's. There were only 31 active vessels in 2000.

Harpoon gear consists of a handle about 3-5 m long, attached to a metal shank, approximately 0.6 m long, which is tipped with a removable bronze or iron dart (Coan et al., 1998). The dart is attached to a mainline 15-46 m long, which terminates with floats and markers. Harpoon fishermen search for swordfish at the sea surface. The prevalent method of sighting swordfish is looking for them while they are "finning" or basking on the surface in blue/green water of 12°-26°C. When a fish is spotted and harpooned, the handle is pulled free from the dart and the main line, marker flag, and floats are played out until free from the vessel. The fish is allowed to tire itself before being hauled aboard.

The fishing area extends from San Diego to San Francisco (Coan et al., 1998). The fishery begins in April or May in waters off San Diego, peaks in July or August, and ends in December in waters off San Francisco. The fishery also has small catches of sharks, mainly thresher shark.

Harpoon landings have been recorded as far back as 1918. Harpoon landings of swordfish varied substantially, ranging from 42-1,699 t during 1974 to present with swordfish landings at 86 t in 2000.

Harpoon fishery swordfish CPUE (number of fish per day) was higher for vessels that used spotter aircraft than for vessels that did not, except for 1980 through 1983 when spotter aircraft use was low (Coan et al., 1998). Combined swordfish CPUE (with and without aircraft) varied from 0.12 fish per day in 1983 to 0.46 fish per day in 1978 (Fig. 9).

2. DATA SOURCES

Hawaii

There are six sources of data on swordfish in Hawaii (Tables 2 and 3): Federal daily longline logbooks (collection began in 1990 and is ongoing); shoreside market sampling (1987-ongoing); State of Hawaii commercial fishermen catch reports (1948-ongoing); reports by at-sea observers deployed by NMFS (1990-ongoing); NOAA ship *Townsend Cromwell* research cruises (1991-ongoing); and voluntary tag, release, and recovery information from fishermen. Each of the six data sets contain unique information that provides insight on the performance of the fishery and the biology and ecology of swordfish as well as other pelagic species caught. Linking the data sets also allows NMFS scientists to evaluate the accuracy of the data.

All U.S. longline vessels based in Hawaii are required to maintain a daily federal longline logbook and submit it after each trip. The logbook data represent the most complete coverage of all data sets for the Hawaii-based longline fishery. Data recorded in the logbooks include: fishing effort, number of fish caught by species, location, gear configuration, and interactions with protected species. Number of vessels, effort (hooks), catch (in numbers of fish), and CPUE were calculated from logbook data.

Market data on longline landings contain detailed biological data and economic information at the wholesale level. During 1987-2000, market samplers collected data on 25-

90% of the fish landed by the Hawaii-based longline fishery. For fish sampled at the market, individual fish weights were recorded to the nearest half pound. Weights were raised to an estimated whole weight when processing or damage was observed. Average size, size frequency, and average ex-vessel price by species were summarized from this data set. Sex of fish was not available as most swordfish were landed in processed form (headed, finned, and gutted).

The State of Hawaii Division of Aquatic Resources (HDAR) requires longline fishermen (and other commercial fishermen) to submit trip reports which list the pelagic species caught. The HDAR longline data includes: number caught, pounds caught, pounds sold and total value for each species.

Data collection by at-sea observers began when Hawaii-based longline vessels volunteered to take observers to investigate longline fishery interactions with Hawaiian monk seals (*Monachus schauinslandi*) (Dollar, 1991). A mandatory observer program began in February 1994 (Dollar, 1994) to improve the estimates of incidental take of sea turtles. Observers covered about 5% of the total longline trips from 1994-1999 but coverage increased to 20% in the latter part of 2000. Data collected are similar to logbook data but contain more detailed observations.

During the 1990's, the NOAA research vessel *Townsend Cromwell* dedicated one or two research cruises each year to collecting detailed data on swordfish biology and ecology. The cruises deploy standard monofilament longline gear to catch swordfish. Hook timers and time-depth recorders (TDRs) were used to collect information on fishing depth of the gear and on swordfish behavior. Observations on condition of the catch and biological measurements were recorded. Biological samples such as muscle tissue, gonads, stomach, otoliths, and anal fin rays were also collected. Some live swordfish specimens were tagged and released. Oceanographic conditions were monitored with expendable bathythermographs (XBTs), conductivity-temperature depth (CTD) casts, thermosalinograph (TSG), and acoustic Doppler current profile (ADCP) transects (Boggs, pers. commun.).

Swordfish tagging is conducted with the voluntary participation of longline fishermen and on research cruises. Tag, release, and recapture information such as names of fishermen, gear type, tagging and recovery location, and size estimates of fish were collected (Kazama, pers. commun.).

California

The California-based longline fishery is monitored through landing receipts (1991-ongoing), vessel logbooks (1993-ongoing), and landings sampling by the California Department of Fish and Game (CDFG) (1981-ongoing). Landings data for swordfish have been collected through the landings receipt system (Table 2). Vessel logbook data were collected on a voluntary basis from 1993 to 1994 before being replaced by a mandatory CDFG logbook system in 1995. Logbook information is recorded by fishermen on a daily basis. Positions were entered

at the start and finish of each set. Data were recorded on hooks set and the catch of tunas, billfishes, sharks, and other fish, as well as interactions with marine mammals, turtles, and seabirds. Other information on gear configuration, weather, and sea conditions were also collected. The CDFG longline logbook program was discontinued in 1999 as data reporting became a requirement under the federal High Seas Fisheries Compliance Act. Landings sampling to measure the size of longline-caught swordfish was done in conjunction with sampling of the drift gill net landings (Table 3).

The California drift gill net fishery is monitored through landing receipts (1980-ongoing), vessel logbooks (1980-ongoing), landings sampling by the CDFG (1981-ongoing), and an observer program (1980-1985, 1990-ongoing). Landing receipts and mandatory logbooks have been collected since the fishery's inception (Table 2). Fishermen are required to record daily operations and catch. Location of operations and catch are recorded in 10 minute squares. Swordfish landed by the drift gill vessels are sampled at local markets (Table 3). An observer program to monitor the drift gill net fishery was initiated and maintained by CDFG from 1980 to 1985 and has continued from 1990 under NMFS. The observer program is used to monitor bycatches, especially of marine mammals.

The California harpoon fishery is also monitored through landing receipts (early 1900's-ongoing), vessel logbooks (1974-ongoing), and landings sampling by the CDFG (1981-ongoing). Data on swordfish landings by harpoon vessels are collected through the landings receipt system (Table 2). A mandatory vessel logbook system for the harpoon fishery started in 1974. These logbooks are completed on a daily basis and record catch and area of catch using CDFG 10-minute square codes. Information on aircraft assistance, water color, sea surface temperature, sea conditions, harpooning success, and areas searched are also included. Landings sampling of harpoon-caught swordfish began in conjunction with the drift gill net sampling (Table 3).

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Table 1. Swordfish catch * (metric tons) by U.S. fisheries in the North Pacific.

| Year | Longline | | | Gill net | Harpoon | Other | All gears |
|------|----------|------------|-------|----------|---------|-------|-----------|
| | Hawaii | California | Total | | | | Total |
| 1970 | 5 | - | 5 | - | 612 | 10 | 627 |
| 1971 | 1 | - | 1 | - | 99 | 3 | 103 |
| 1972 | 0 | - | 0 | - | 171 | 4 | 175 |
| 1973 | 0 | - | 0 | - | 399 | 4 | 403 |
| 1974 | 0 | - | 0 | - | 406 | 22 | 428 |
| 1975 | <1 | - | <1 | - | 557 | 13 | 570 |
| 1976 | <1 | - | <1 | - | 42 | 13 | 55 |
| 1977 | 17 | - | 17 | - | 318 | 19 | 353 |
| 1978 | 9 | - | 9 | - | 1,699 | 13 | 1,721 |
| 1979 | 7 | - | 7 | - | 329 | 57 | 393 |
| 1980 | 5 | - | 5 | 160 | 566 | 62 | 792 |
| 1981 | 3 | 1 | 4 | 486 | 243 | 21 | 754 |
| 1982 | 5 | 2 | 7 | 936 | 132 | 42 | 1,117 |
| 1983 | 5 | 3 | 8 | 1,336 | 42 | 379 | 1,765 |
| 1984 | 3 | 15 | 18 | 2,129 | 80 | 666 | 2,893 |
| 1985 | 2 | 47 | 49 | 2,379 | 194 | 798 | 3,420 |
| 1986 | 2 | 5 | 7 | 1,612 | 227 | 685 | 2,531 |
| 1987 | 24 | 5 | 29 | 1,300 | 205 | 293 | 1,827 |
| 1988 | 24 | 19 | 43 | 1,101 | 173 | 343 | 1,660 |
| 1989 | 281 | 19 | 300 | 1,064 | 54 | 221 | 1,639 |
| 1990 | 2,436 | 18 | 2,454 | 1,047 | 50 | 121 | 3,672 |
| 1991 | 4,508 | 39 | 4,547 | 827 | 16 | 147 | 5,537 |
| 1992 | 5,700 | 83 | 5,783 | 1,234 | 64 | 167 | 7,248 |
| 1993 | 5,909 | 148 | 6,057 | 1,387 | 168 | 63 | 7,675 |
| 1994 | 3,176 | 743 | 3,919 | 767 | 154 | 30 | 4,870 |
| 1995 | 2,713 | 283 | 2,996 | 754 | 97 | 30 | 3,877 |
| 1996 | 2,502 | 347 | 2,849 | 728 | 80 | 24 | 3,681 |
| 1997 | 2,881 | 665 | 3,546 | 694 | 83 | 15 | 4,338 |
| 1998 | 3,263 | 414 | 3,677 | 899 | 47 | 26 | 4,649 |
| 1999 | 3,100 | 1,304 | 4,404 | 584 | 79 | 52 | 5,119 |
| 2000 | 2,949 | 1,918 | 4,867 | 681 | 86 | 55 | 5,689 |

Dashes indicate no fishery.

* Estimated whole weight of landed swordfish. Does not include discards.

Table 2.--U.S. North Pacific swordfish catch-effort data catalog.

| Year | Country/State | Gear* | Data set* | Measurement of catch | Type of effort | Time strata | Geographic resolution |
|------|---------------|-------|-----------|----------------------|----------------|-------------|-----------------------|
| 1974 | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| 1975 | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/HI | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1976 | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/HI | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1977 | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/HI | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1978 | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/HI | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1979 | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/HI | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1980 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1981 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1982 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1983 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1984 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1985 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1986 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1987 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1988 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1989 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |

* GN = GILL NET, HP = HARPOON, LL = LONGLINE
 LB = LOGBOOK DATA, OBS = OBSERVER DATA (M = MANDATORY, V = VOLUNTARY)
 CR = STATE CATCH REPORT, RC = RESEARCH CRUISE DATA

Table 2 (continued).--U.S. North Pacific swordfish catch-effort data catalog.

| Year | Country/State | Gear* | Data Set* | Measurement of catch | Type of effort | Time strata | Geographic resolution |
|------|---------------|-------|-----------|----------------------|----------------|-------------|-----------------------|
| 1990 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/HI | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/HI | LL | OBS(V) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| 1991 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/HI | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/HI | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/HI | LL | OBS(V) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/HI | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| 1992 | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | OBS(V) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| 1993 | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | OBS(V) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | OBS(V) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| 1994 | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | LB | NO. FISH | SETS/HOOKS | DAY | 1 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | OBS(M) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| 1995 | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | LB | NO. FISH | SETS/HOOKS | DAY | 1 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | OBS(M) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| 1996 | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 10 MIN |
| | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | LB | NO. FISH | SETS/HOOKS | DAY | 1 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | OBS(M) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |

Table 2 (continued).--U.S. North Pacific swordfish catch-effort data catalog.

| Year | Country/State | Gear* | Data Set* | Measurement of catch | Type of effort | Time strata | Geographic resolution |
|------|---------------|-------|-----------|----------------------|----------------|-------------|-----------------------|
| 1997 | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| | USA/CA | HP | LB | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | LL | LB | NO. FISH | SETS/HOOKS | DAY | 1 MIN |
| | USA/HI | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/HI | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/HI | LL | OBS(M) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/HI | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| 1998 | USA/CA | GN | OBS(M) | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | HP | LB | NO. FISH | SETS/HOOKS | DAY | 1 MIN |
| | USA/CA | LL | LB | NO. FISH | SETS/HOOKS | DAY | 1 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | OBS(M) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| 1999 | USA/CA | GN | OBS(M) | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | HP | LB | NO. FISH | SETS/HOOKS | DAY | 1 MIN |
| | USA/CA | LL | LB | NO. FISH | SETS/HOOKS | DAY | 1 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | OBS(M) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | GN | LB | NO. FISH | SETS/DAYS | DAY | 10 MIN |
| | USA/CA | GN | OBS(M) | NO. FISH | SETS/DAYS | DAY | 1 MIN |
| 2000 | USA/CA | GN | OBS(M) | NO. FISH | PURSUIITS/DAY | DAY | 10 MIN |
| | USA/CA | HP | LB | NO. FISH | SETS/HOOKS | DAY | 1 MIN |
| | USA/CA | LL | LB | NO. FISH | SETS/HOOKS | DAY | 1 MIN |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/CA | LL | CR | NO.&WT. FISH | DAYS/TRIP | TRIP | --- |
| | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | LB | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | OBS(M) | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |
| | USA/CA | LL | RC | NO. FISH | NO. HOOKS | DAY | 1 MIN |

Table 3.--U.S. North Pacific swordfish size frequency data catalog.

| Year | Country/State | Gear* | Data set* | Time strata | Type square | Length | Interval | Weight | Interval |
|------|---------------|-------|-----------|-------------|-------------|--------|----------|--------|------------|
| 1981 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| 1982 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| 1983 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| 1984 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| 1985 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| 1986 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| 1987 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| 1988 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| 1989 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| 1990 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | OBS(V) | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| 1991 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | RC | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | TAG | DAY FISH | 1 MIN | Y | EST | Y | 0.5 LB/EST |
| 1992 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | OBS(V) | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | RC | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | TAG | DAY FISH | 1 MIN | Y | EST | Y | 0.5 LB/EST |
| 1993 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | OBS(V) | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | RC | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | TAG | DAY FISH | 1 MIN | Y | EST | Y | 0.5 LB/EST |

* GN = GILL NET, HP = HARPOON, LL = LONGLINE
MKT = MARKET DATA, OBS = OBSERVER DATA (M = MANDATORY, V = VOLUNTARY)
RC = RESEARCH CRUISE DATA, TAG = TAGGING STUDIES

Table 3 (continued).--U.S. North Pacific swordfish size frequency data catalog.

| Year | Country/State | Data gear* | Time set* | Type strata | Square | Length | Interval | Weight | Interval |
|------|---------------|------------|-----------|-------------|--------|--------|----------|--------|-----------|
| 1994 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | OBS(M) | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | RC | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | TAG | DAY FISH | 1 MIN | Y | EST | Y | 0.5LB/EST |
| 1995 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | OBS(M) | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | RC | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | TAG | DAY FISH | 1 MIN | Y | EST | Y | 0.5LB/EST |
| 1996 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | OBS(M) | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | RC | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | TAG | DAY FISH | 1 MIN | Y | EST | Y | 0.5LB/EST |
| 1997 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | OBS(V) | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | RC | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | TAG | DAY FISH | 1 MIN | Y | EST | Y | 0.5LB/EST |
| 1998 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | OBS(M) | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | RC | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | TAG | DAY FISH | 1 MIN | Y | EST | Y | 0.5LB/EST |
| 1999 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | OBS(V) | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | RC | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | TAG | DAY FISH | 1 MIN | Y | EST | Y | 0.5LB/EST |
| 2000 | USA/CA | GN | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | HP | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | 10 MIN | Y | 1 MM | Y | 1 LB |
| | USA/CA | LL | MKT | LAND DATE | --- | N | --- | Y | 0.5 LB |
| | USA/CA | LL | OBS(M) | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | RC | DAY FISH | 1 MIN | Y | 1 MM | Y | 0.5 LB |
| | USA/CA | LL | TAG | DAY FISH | 1 MIN | Y | EST | Y | 0.5LB/EST |

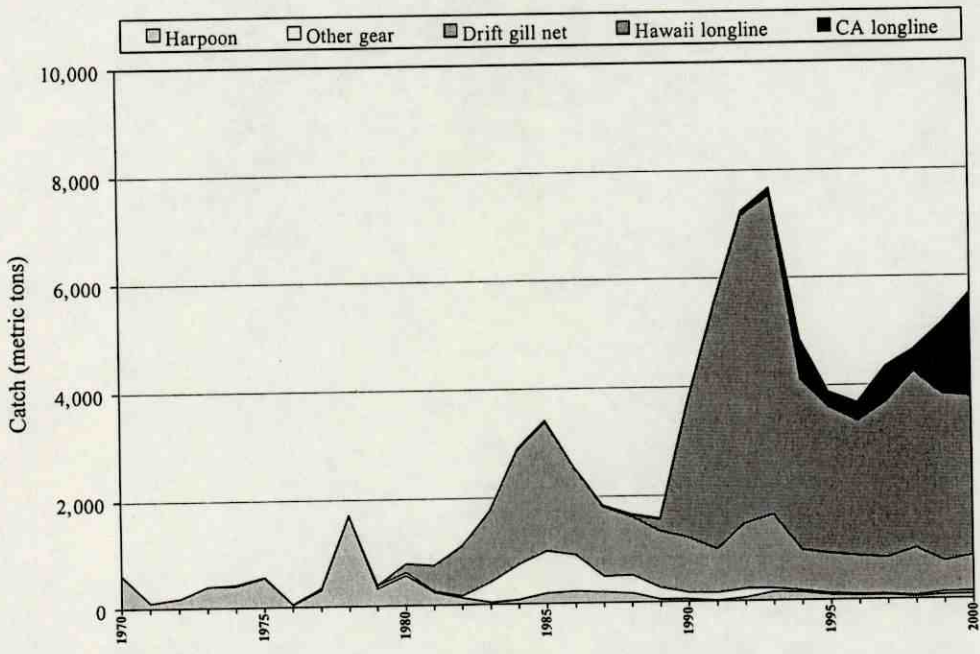


Figure 1. Swordfish catch by U.S. fisheries in the North Pacific, 1970-2000.

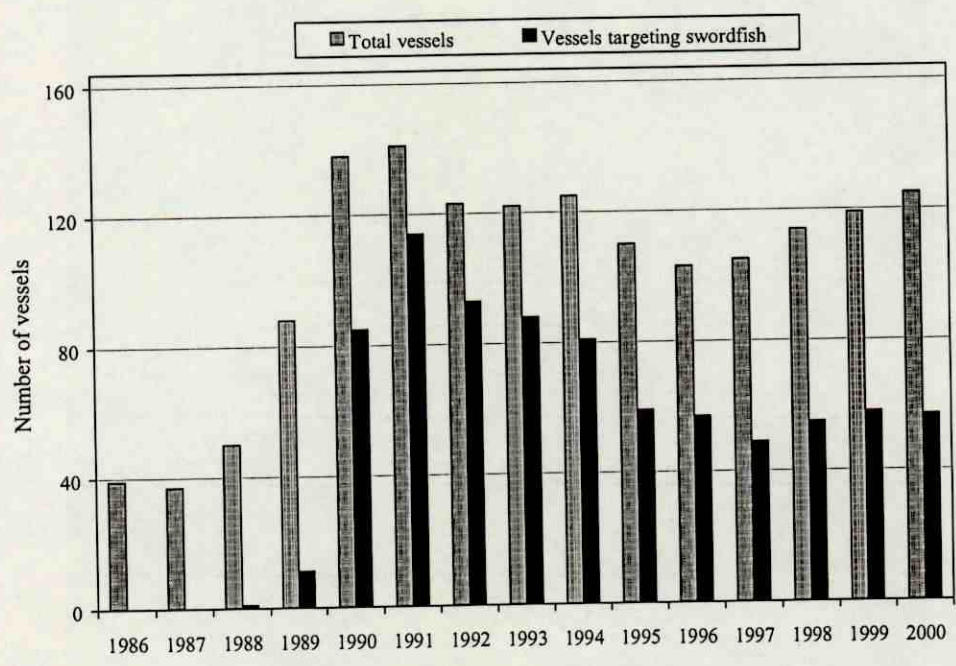


Figure 2. Total number of active Hawaii-based longline vessels and longliners targeting swordfish, 1986-2000.

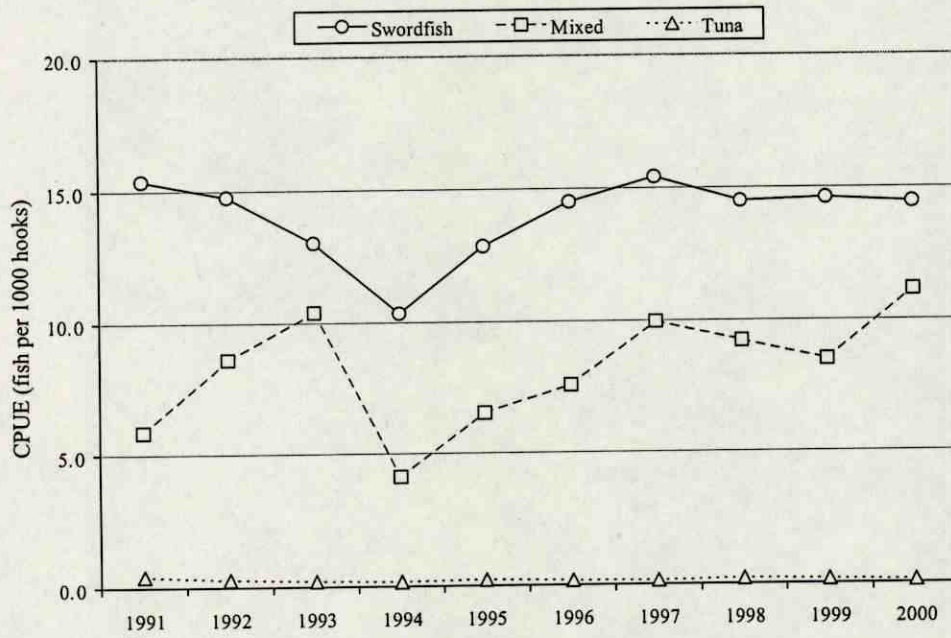


Figure 3. Swordfish catch-per-unit-effort (CPUE) for Hawaii-based longline vessels, by trip type, 1991-2000.

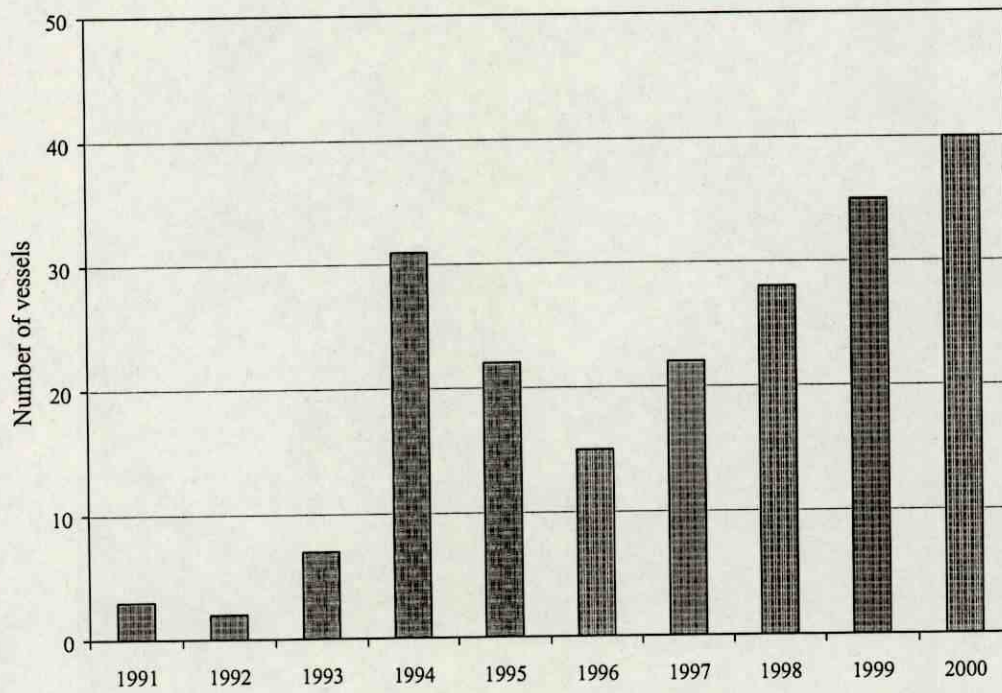


Figure 4. Number of California longline vessels, 1991-2000.



Figure 5. Swordfish catch-per-unit effort (CPUE) by California-based longline vessels, 1994-2000.

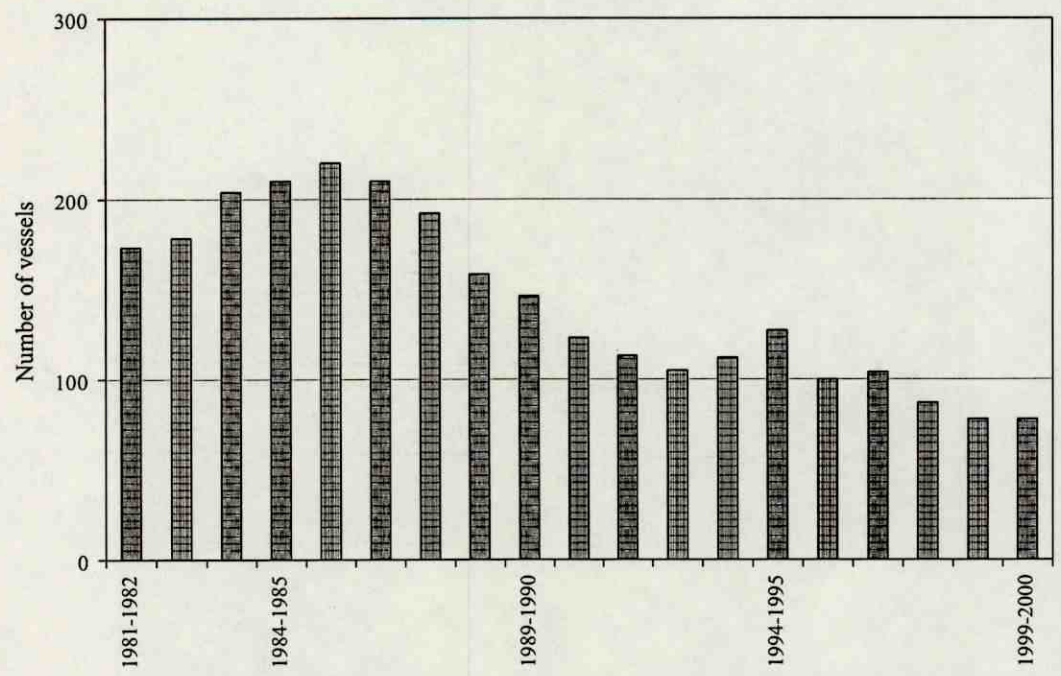


Figure 6. Number of California drift gill net vessels, 1981-1982 through 1999-2000 seasons.

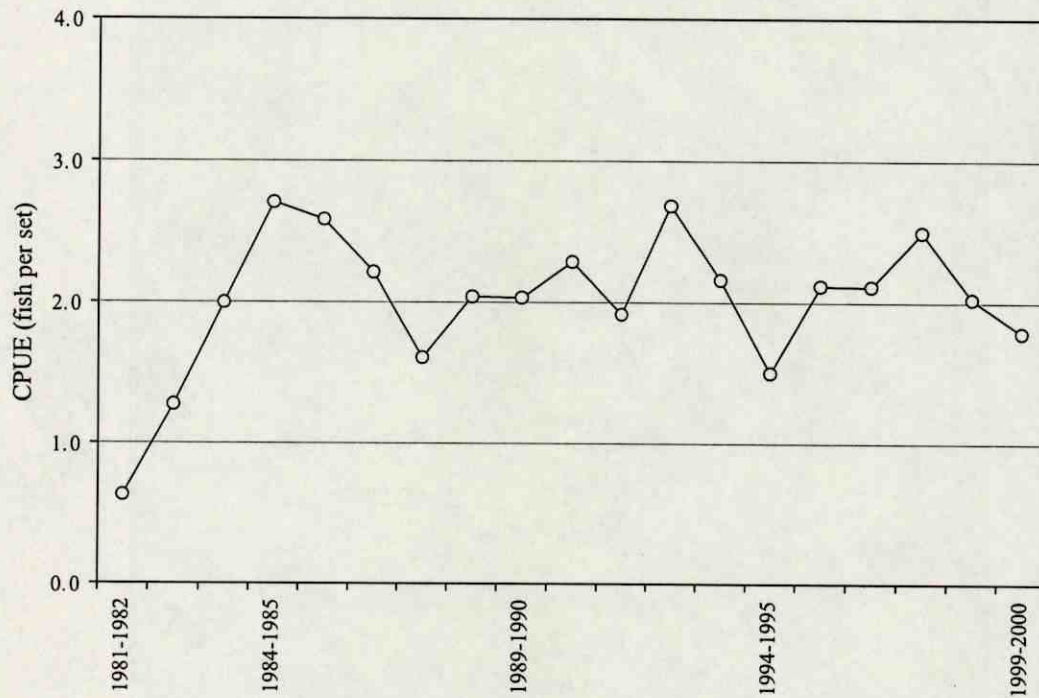


Figure 7. Swordfish catch-per-unit-effort (CPUE) by California drift gill net vessels, 1981-1982 through 1999-2000 seasons.

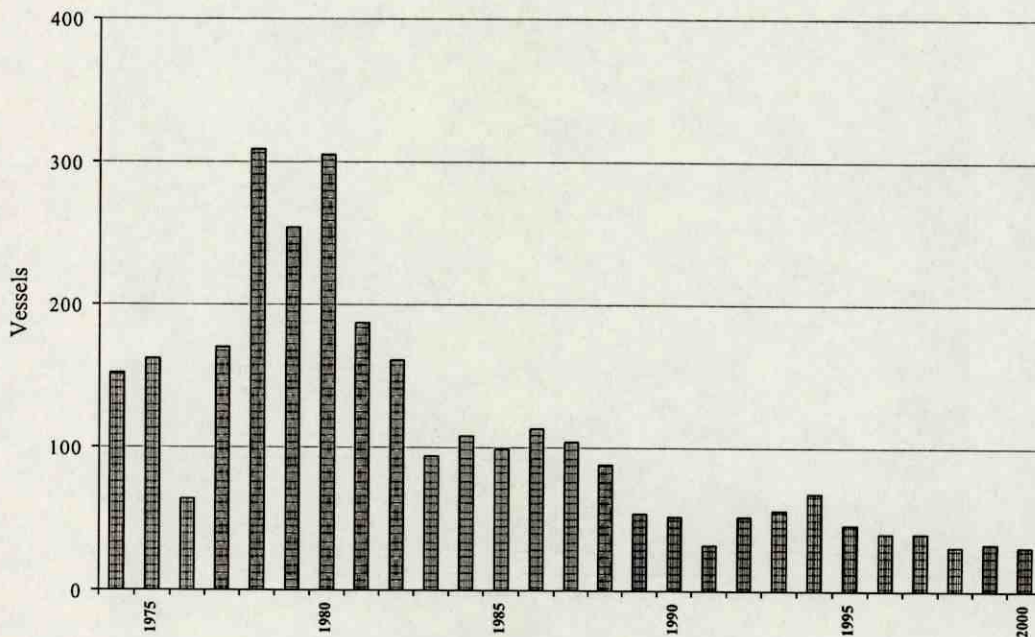


Figure 8. Number of California harpoon vessels, 1974-2000.

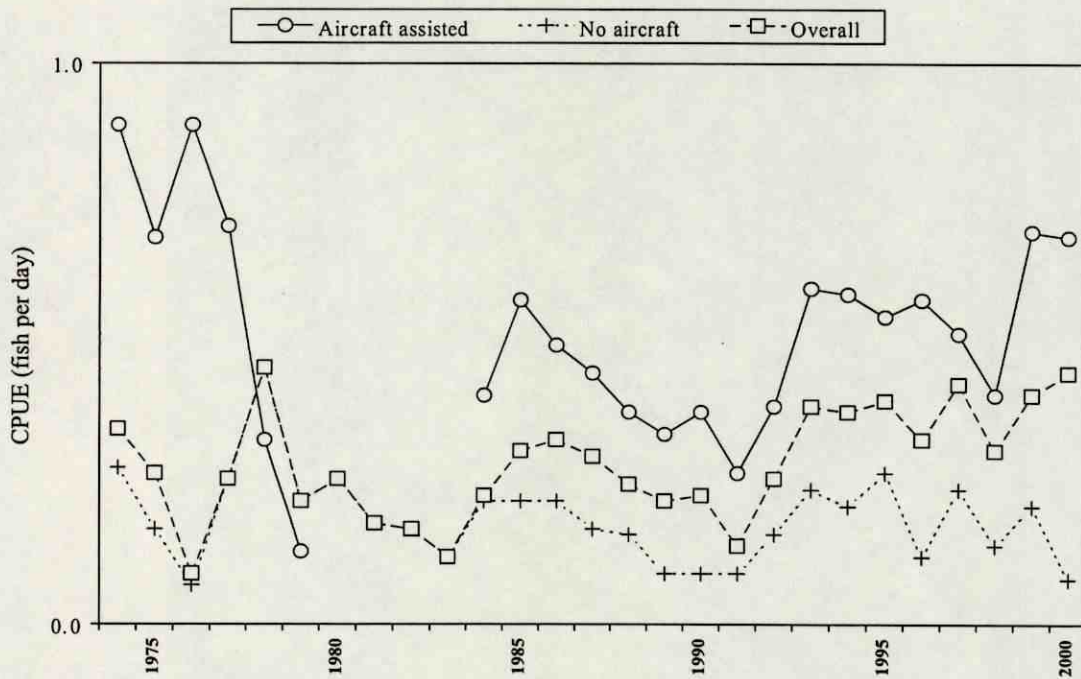


Figure 9. Swordfish catch-per-unit-effort (CPUE) by California harpoon vessels, 1974-2000.