U.S. Swordfish Fisheries in the North Pacific Ocean[1]

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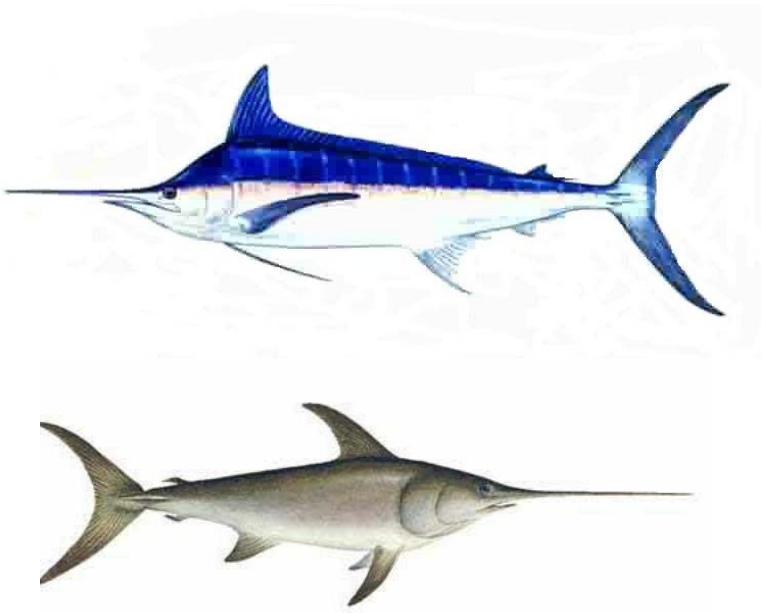

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INTRODUCTION

The United States is a major harvesting and consuming nation for swordfish (*Xiphias gladius*). U.S. fisheries in the Atlantic Ocean, Gulf of Mexico, and Pacific Ocean harvested 3,166 metric tons (mt) in 2005 (NMFS, Fisheries Statistics and Economics Division, 2007). Of this total, 1,897 mt (60%) were taken in the North Pacific Ocean. This report summarizes historical trends and recent developments in these fisheries.

1. FISHERIES AND CATCHES

U.S. swordfish fisheries of the North Pacific Ocean can be categorized according to gear types: harpoon, drift gill net, longline, and other gear. "Other gear" includes set gill nets and unidentified gear. Harpoon fishing for swordfish in California is the oldest of the three, dating back to the early 1900's (Coan et al., 1998). This fishery primarily supplied the local market for swordfish until the late 1970s. Harpoon landings reached a record high in 1978, subsided to a more typical level the following year, and remained at relatively low levels thereafter (Fig. 1, Table 1). The California drift gill net fishery began in 1980 but expanded rapidly enough to become the largest U.S. swordfish fishery in the North Pacific Ocean after only one year. Drift gill net landings continued to increase to a peak in 1985, but then began to decrease, although 1992 and 1993 yielded relatively high landings. In the mid-1980s some California drift gill net landings were not separated from set gill net landings and, therefore, contributed to substantial landings in the other gear category. Swordfish-directed longlining in Hawaii began in 1988 and grew rapidly to a peak in 1993. This longline fishery was the largest U.S. swordfish fishery in the North Pacific Ocean from 1990 through 2000. Many Hawaii-based vessels then migrated to California and made the California-based fleet the largest U.S. fishery for swordfish during 2001-2004. Almost all these vessels moved back to Hawaii in 2004 and 2005.

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California Harpoon Fishery

The California harpoon fishery started in the early 1900s with landings recorded since 1918. The number of harpoon vessels peaked at 309 in 1978 (Fig. 2). Participation dropped below 200 vessels in the early 1980s and continued to decline throughout the 1990's. There were only 25 active vessels in 2006.

The fishing area typically ranges from San Diego to San Francisco but sometimes extends as far north as Oregon (Coan et al.,1998). Most fishing effort occurs within 200 miles of shore. The fishery usually begins in April or May in waters off San Diego, peaks in July or August, and ends in December in waters off San Francisco.

Harpoon landings of swordfish have varied by more than two orders of magnitude ranging from 16 mt in 1991 to 1,699 mt in 1978. The preliminary estimate of swordfish landings in 2006 was 71 mt (Table 1).

Harpoon catch-per-unit-effort (CPUE) is calculated from logbook data and measured as number of fish per day. One important factor in the harpoon fishery is the use (or lack thereof) of spotter aircraft. Swordfish CPUE for vessels using spotter aircraft was about twice that of vessels that did not. Aircraft were not used from 1978 through 1983 (Coan et al., 1998). The trends for swordfish CPUE using spotter aircraft and no aircraft assistance were similar, with the aircraft assisted CPUE higher. Harpoon swordfish CPUE values for vessels with and without aircraft assistance were 1.23 and 0.45, respectively, in 2005. Harpoon logbook data for 2006 will not be available until March 30, 2007.

California Drift Gill Net Fishery

The California drift gill net fishery began in the late 1970s. Swordfish, common thresher shark (*Alopias vulpinus*) and shortfin mako shark (*Isurus oxyrinchus*) are targeted species (Hanan et al., 1993). Swordfish catch by this fishery was initially low, but increased in the early 1980s when regulations were changed to allow for greater landings of swordfish. The number of active drift gill net vessels peaked at 220 during 1985-1986 (the season extends from April of one year to March of the following year), decreased to a record low of 34 vessels during 2003-2004, and increased slightly to 45 vessels in 2005-2006 (Fig. 4). However, participation was far below the 150 permitted vessels allowed by California Department of Fish and Game (CDFG).

Drift gill net fishing effort is concentrated in the Southern California Bight, from Point Conception southward to Mexico, but can extend northward past San Francisco to Oregon. Most of the fishing effort occurs within 200 miles of shore. The drift gill net fishery begins in May and lasts about 10 months with peak swordfish catches in October and November.

Swordfish landings by the drift gill net fishery grew from 160 mt in 1980 to a peak of 2,368 mt in 1985 and declined thereafter. Swordfish landings by the drift gill net fishery in 2006 were 430 mt (Table 1).

Drift gill net CPUE is measured as number of fish per set. Drift gill net CPUE rose from 0.6 swordfish per set in 1981-1982 and peaked at 2.7 swordfish per set in the 1984-1985 season (Fig. 5). This level was reached again in the 1992-1993 season. Drift gill net CPUE declined after the 1992-1993 season to 1.1 fish per set in the 2003-2004 and was 1.8 in 2005-2006.

Hawaii-based Longline Fishery

The Hawaii-based longline fleet has two main components: vessels using deep-set gear to target tunas, and vessels using shallow-set gear to target swordfish. The Hawaii-based fishery for swordfish is heavily regulated and was prohibited during much of 1999-2004 due to sea turtle interactions. It reopened as a "model fishery" in April 2004 under new regulations promulgated by NOAA Fisheries. The new regulations were intended to minimize interactions between longline gear and sea turtles and included a limit of 2,120 shallow sets per year, use of transferable shallow-set certificates (one certificate per set) by eligible Hawaii longline limited access permit holders, and a requirement to notify NOAA Fisheries of any intent to deploy shallow sets before embarking on fishing trips. They required vessel operators to make sets only of the type declared (i.e., shallow-sets or deep-sets), and established annual fleet limits on the numbers of interactions with leatherback (*Dermochelys coriacea*) and loggerhead (*Caretta caretta*) sea turtles, with mandatory closures of the shallow-set fishery when either limit is reached. They established specific rules regarding hook types, bait types, and setting and hauling operations and required that longline vessels carry turtle de-hooking devices.

Swordfish longlining techniques used in Florida were introduced to Hawaii by the fishing vessel *Magic Dragon* (Ito et al., 1998). The number of Hawaii-based longline vessels increased rapidly from 37 vessels in 1987 to 141 vessels in 1991 as U.S. longliners from the Gulf of Mexico and the Atlantic swordfish fisheries joined the Hawaii-based fleet (Fig. 6). A federal moratorium was implemented in 1991 to limit the number of longline permits at 167. Vessel participation never reached the limit. The moratorium on permits was replaced with a limited entry program in 1994 which capped participation in Hawaii's longline fishery at 164 vessels. Vessel activity ranged from 100 to 125 vessels up through 2005, with 127 active longline vessels in 2006.

Although the shallow-set longline fishery for swordfish was reopened in March 2004, 2005 was the first year in which this model Hawaii fishery operated year-around. Thirty-five Hawaii-based longline vessels set shallow gear targeting swordfish in 2006, up from 30 vessels in 2005.

Since 1991, the fleet extended from the equator to 50^{o} N latitude and from 130^{o} W to 175^{o} E longitude. In 2006, the Hawaii-based longline fishery ranged from the equator to 45^{o} N

latitude and from 135° to 175° W longitude in 2006. The shallow-set longline fishery typically operates in latitudes north of the Hawaiian Islands. Overall, most Hawaii-based longline effort in 2006 was on the high seas (52%) and in the Main Hawaiian Islands (MHI) Exclusive Economic Zone (EEZ) (33%). Aggregate effort by the Hawaii-based longline fishery has been increasing with a record 35.2 million hooks set in 2006. Shallow-set longline effort for swordfish typically is highest during the first half of the year, whereas tuna-directed effort increases in the last quarter of the year to a winter peak.

Swordfish landing statistics for the California-based longline fishery in 2005 and 2006 could not be divulged because there was only one vessel active. Therefore, Hawaii- and California -based longline swordfish landings in the North Pacific Ocean were combined (Table 1). The preliminary estimate of 2006 U.S. longline landings for swordfish in the North Pacific Ocean was 1,193 mt, down 25% from the previous year. The decline in swordfish landings was primarily caused by the closure of the Hawaii-based shallow-set longline fishery in March 2006. The single California-based longline vessel employed deep-set tuna target gear and had only small incidental catches of swordfish in the past two years.

The Hawaii-based longline fishery was the largest producer of swordfish of all the U.S. North Pacific Ocean swordfish fisheries from 1990 through 2000. Swordfish landings[3] from this fishery began to increase in 1989 when a few vessels successfully targeted swordfish. Swordfish-directed effort increased rapidly thereafter with swordfish catch peaking in 1993. Swordfish landings dropped significantly the following year and stabilized throughout 1994-2000. Swordfish landings by the Hawaii-based longline fishery again decreased significantly during 2001-2003 as a result of the NMFS prohibition of shallow sets. The Hawaii-based shallow set longline fishery for swordfish was reopened in April 2004 but landings for the year were low for the reasons described earlier. With the first complete year in 2005, the Hawaii-based longline fishery reestablished itself as the largest U.S. fishery for swordfish in the North Pacific Ocean. Although the fishery was closed in March 2006 due to interactions with loggerhead sea turtles, the Hawaii-based longline fishery nonetheless maintained its status as the largest of U.S. fisheries for swordfish in the North Pacific Ocean, despite the short season.

Swordfish CPUE (number of fish per 1,000 hooks) varies substantially according to species targeting (Fig. 7) and may also be affected by operational factors, e.g., gear restrictions. In years prior to the April 2004 opening of the model fishery, swordfish CPUE for trips that specifically targeted swordfish ranged from 10.3 fish in 1994 to 15.4 fish in 1991 and 1997. Swordfish CPUE was 11.7 in 2001, the last year in which swordfish trips were conducted under older conditions. Under the model fishery, there was a low level of swordfish-directed effort in the fourth quarter of 2004 and CPUE on those trips was 12.7. In 2005, the first complete year which the Hawaii-based longline fishery operated under the new regulations, swordfish vessels

[3]Swordfish landings statistics are reported as estimated whole weight. However, most swordfish are processed at sea and typically landed without head, guts, and tail. A multiplier of 1.45 was used to convert processed weight to whole weight.

achieved a CPUE of 15.4 and vessels targeting tuna had a swordfish CPUE of 0.1. Swordfish CPUE was a record 19.1 fish per 1,000 hooks in 2006. Swordfish CPUE on swordfish-targeted trips usually was highest during the first and second quarters and lowest in the third.

California-based Longline Fishery

The California-based longline fishery began in 1991 when three vessels based in San Pedro fished waters outside the U.S. EEZ (Vojkovich and Barsky, 1998). The longline fleet increased to 31 vessels in 1994, peaked at 44 vessels in 2000, and has since decreased to only a single vessel in 2005 and 2006 (Fig. 8). During its peak years, the California-based longline fleet consisted primarily of vessels that had targeted swordfish in Hawaii, but migrated to California in response to the turtle interaction lawsuit. Since April 2004, California-based longline vessels have been prohibited from using shallow-set gear to target swordfish.

California does not allow pelagic longline fishing within the EEZ; therefore, the California-based longline fishery operated exclusively on the high seas. When this fishery first began, effort typically peaked late in the year and the fleet began fishing closer to Hawaii.

Swordfish landings by the California-based longline fishery increased from negligible levels in the early 1980s to a peak in 2000. The California-based longline fishery was the largest U.S. swordfish fishery in the North Pacific Ocean from 2001 to 2004.

California-based longline CPUE (number of fish per 1000 hooks) for swordfish varied from 6.3 in 1995 to 25.3 in 2004 (Fig. 9). The last year swordfish CPUE was available for this fishery is 2004.

2. DATA SOURCES

Hawaii

There are six types of data sets on swordfish in Hawaii: Federal daily longline logbooks; market data collected by NMFS and the State of Hawaii; State of Hawaii commercial fishermen catch reports; reports by at-sea observers deployed by the NMFS; data collected on NOAA research cruises; and voluntary tag and release data from fishermen (Tables 2 and 3). Cross-referencing certain data sets allows NMFS scientists to evaluate the accuracy of the data. Each of the six types of data sets contains unique information, but in the aggregate these data sets provide considerable insight to the performance of the fishery as well as the biology and ecology of swordfish and other pelagic species caught.

Federal longline logbooks have been mandatory for Hawaii-based longline vessels since November 1990. Logbooks with daily information on fishing operations must be maintained by vessel operators and submitted after each trip. Data recorded in the logbooks include: vessel,

date, fishing location, effort and gear configuration, catches by species, and interactions with protected species.

Market data on longline landings were first collected at the Honolulu fish auction by the NMFS in 1987. The sample size from the market ranged from 25%- 90% of fish landed by the Hawaii-based longline fishery throughout 1987-2000. Individual fish weights were recorded to the nearest half pound. Weights were raised to an estimated whole weight when processing or damage was observed. Sex of fish was not available as most swordfish were landed in processed form (headed, finned, and gutted). The responsibility for collecting market data was transferred to the State of Hawaii, Division Aquatic Resources (DAR) in 2002. Coverage of the DAR market data is estimated to be in excess of 90%.

The DAR commercial fish catch data have been collected from 1948 to the present. The HDAR requires longline fishermen to submit longline trip reports listing the pelagic species caught. The HDAR longline data include number caught, pounds caught, pounds sold and total value for each species.

Data collection by at-sea observers was initiated in 1990 when Hawaii-based longline vessels volunteered to take observers aboard to investigate longline fishery interactions with Hawaiian monk seals (*Monachus schauinslandi*) (Dollar, 1991). A mandatory observer program began in February 1994 (Dollar, 1994) using statistical guidelines to improve the estimates of incidental takes of sea turtles (DiNardo, 1993). Observers covered about 5% of the total longline trips from 1994-1999. Observer coverage was then increased in response to new regulations and has remained at or above 20% for the deep-set tuna sector of the Hawaii-based longline fishery from the latter part of 2000 through 2006. Beginning in 2004, observer coverage on shallow-set trips targeting swordfish was 100%. The observer data are similar to logbooks, although more detailed. The primary purpose for the data collected by the observer program is to assess the magnitude of longline interactions with protected and endangered species.

The NOAA research vessel *Townsend Cromwell* began a series of research cruises devoted to collecting detailed data on swordfish biology and ecology in 1991. The cruises deployed 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, stomachs, 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 (Christofer Boggs, pers. commun.).

Swordfish tagging has been conducted opportunistically on research cruises and through the cooperative efforts of longline fishermen. A database has been assembled with available

information on dates and locations of tag release and recapture, names of fishermen, gear type, and size estimates of fish.

California

There are four types of data on the California-based longline fishery: CDFG landing receipts; CDFG and Federal daily longline logbooks; data from dockside sampling of swordfish landings collected by the CDFG; and data collected at sea by NMFS observers. Landing receipts have been collected by the CDFG since the start of the fishery in 1991 (Table 2). Daily longline logbook data were first collected by the CDFG on a voluntary basis from 1993 to 1994. Collecting and submitting CDFG longline logbook data under the Pacific Offshore Longline Logbook system became mandatory in 1995. This system was replaced in 1999 by a NMFS longline logbook data reporting system in response to Federal requirements under the High Seas Fisheries Compliance Act. Data recorded in the logbooks include: vessel, date, fishing location, effort and gear configuration, numbers of fishes caught by species, and interactions with protected species. Collection of longline-caught swordfish size samples began in 1991 in conjunction with drift gill net swordfish catch sampling (Childers and Halko, 1994) but was discontinued in 2000. NMFS has placed observers on longline vessels since 2001 to investigate interactions with sea turtles and collect detailed catch and effort data. Some size data are also collected by observers.

The California drift gill net fishery is monitored using CDFG landing receipts, vessel logbooks, size sampling, and a CDFG and NMFS observer program. Landing receipts have been collected by the CDFG since the fishery's inception in 1980 (Table 2). Drift gill net fishermen are required to collect logbook data on daily operations and catch. Location of fishing is recorded in 10 minute squares. CDFG sampled drift gill net swordfish catch for length at local markets beginning in 1981 (Table 3). An observer program to monitor the drift gill net fishery was initiated and maintained by CDFG from 1980 to 1989 and has continued since 1990 under NMFS. The observer program is used to monitor bycatch, especially of marine mammals. The NMFS observer program also collects size samples of swordfish.

The California harpoon fishery is also monitored through landings receipts, vessel logbooks, and size sampling by the CDFG. Landings data have been collected since the early 1900s (Table 2). A mandatory vessel logbook system for the harpoon fishery started in 1974. Logbook records are completed daily and include catches by location in the CDFG 10-minute square codes. Information on aircraft assistance, water color, sea surface temperature and condition, harpooning success, and areas searched is also included. Size sampling of swordfish landings began in 1981 in conjunction with the drift gill net sampling (Table 3). The harpoon fishery sampling program was discontinued in 2000.

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Table 1.-- U.S. North Pacific swordfish landings* (metric tons), 1970-2006. Dashes indicate no fishery.

Year	Harpoon	Gill net	Longline	Other	Total U.S. North Pacific
1970	612	---	5	10	627
1971	99	---	1	3	103
1972	171	---	0	4	175
1973	399	---	0	4	403
1974	406	---	0	22	428
1975	557	---	0	13	570
1976	42	---	0	13	55
1977	318	---	17	19	354
1978	1,699	---	9	13	1,721
1979	329	---	7	57	393
1980	566	160	5	62	793
1981	267	461	4	20	752
1982	156	911	7	43	1,117
1983	58	1,321	6	378	1,763
1984	96	2,101	17	678	2,892
1985	211	2,368	48	792	3,419
1986	236	1,594	6	696	2,532
1987	211	1,287	28	300	1,826
1988	180	1,092	43	344	1,659
1989	54	1,050	310	224	1,638
1990	50	1,028	2,455	137	3,670
1991	16	836	4,547	137	5,536
1992	74	1,332	5,795	44	7,245
1993	169	1,400	6,074	36	7,679
1994	153	799	3,916	8	4,876
1995	96	755	2,992	31	3,874
1996	81	752	2,849	10	3,692
1997	84	707	3,545	3	4,339
1998	48	924	3,685	13	4,670
1999	81	606	4,433	2	5,122
2000	90	646	4,857	9	5,602
2001	52	375	1,983	5	2,415
2002	90	302	1,524	3	1,919
2003	107	216	1,959	0	2,282
2004	62	169	1,111	37	1,379
2005	76	220	1,601	0	1,897
2006	71	430	1,193	2	1,696

* Based on estimated whole weight and 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	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
1975	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1976	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1977	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1978	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1979	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1980	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	
1981	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1982	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1983	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1984	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1985	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1986	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1987	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1988	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
1989	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---

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	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	OBS(V)	NO. FISH	NO. HOOKS	DAY	1 MIN
1991	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(V)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
1992	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(V)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
1993	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(V)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
1994	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
1995	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
1996	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	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	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
1998	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
1999	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
2000	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
2001	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
2002	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	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
2003	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
2004	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
2005	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN
2006	USA/CA	GILL NET	LB	NO. FISH	SETS/DAYS	DAY	10 MIN
	USA/CA	GILL NET	OBS(M)	NO. FISH	SETS/DAYS	DAY	1 MIN
	USA/CA	HARPOON	LB	NO. FISH	PURSUITS/DAY	DAY	10 MIN
	USA/CA	LONGLINE	LB	NO. FISH	SETS/HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	CR	NO.&WT. FISH	DAYS/TRIP	TRIP	---
	USA/HI	LONGLINE	LB	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	OBS(M)	NO. FISH	NO. HOOKS	DAY	1 MIN
	USA/HI	LONGLINE	RC	NO. FISH	NO. HOOKS	DAY	1 MIN

*CR=STATE CATCH REPORT, LB=LOGBOOK DATA, OBS=OBSERVER DATA (V=VOLUNTARY, M=MANDATORY), RC=RESEARCH CRUISE DATA

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	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
1982	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
1983	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
1984	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
1985	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
1986	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
1987	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
1988	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
1989	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
1990	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(V)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
1991	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	LONGLINE	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5 LB/EST
1992	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	LONGLINE	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(V)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
1993	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	LONGLINE	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(V)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
1994	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	LONGLINE	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(M)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST

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
1995	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	LONGLINE	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(M)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
1996	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	LONGLINE	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(M)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
1997	USA/CA	GILL NET	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	HARPOON	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/CA	LONGLINE	MKT	LAND DATE	10 MIN	Y	1 MM	Y	1 LB
	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(V)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
1998	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(M)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
1999	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(V)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
2000	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(M)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
2001	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(M)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
2002	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(M)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
2003	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(M)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
2004	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(M)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST

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
2005	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(M)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST
2006	USA/HI	LONGLINE	MKT	LAND DATE	---	N	---	Y	0.5 LB
	USA/HI	LONGLINE	OBS(M)	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	RC	DAY FISH	1 MIN	Y	1 MM	Y	0.5 LB
	USA/HI	LONGLINE	TAG	DAY FISH	1 MIN	Y	EST	Y	0.5LB/EST

*MKT=MARKET DATA, OBS=OBSERVER DATA (V=VOLUNTARY, M=MANDATORY), RC=RESEARCH CRUISE DATA, TAG=TAGGING STUDIES

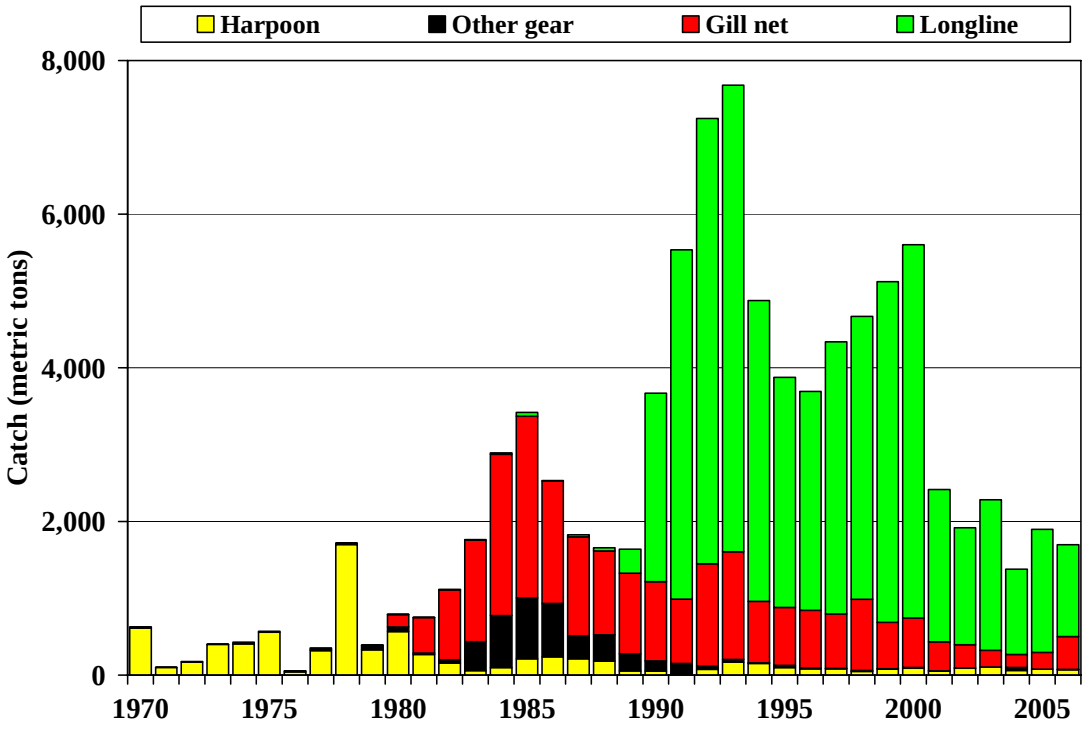

Figure 1. Catch of swordfish by U.S. fisheries in the North Pacific Ocean, 1970-2006.

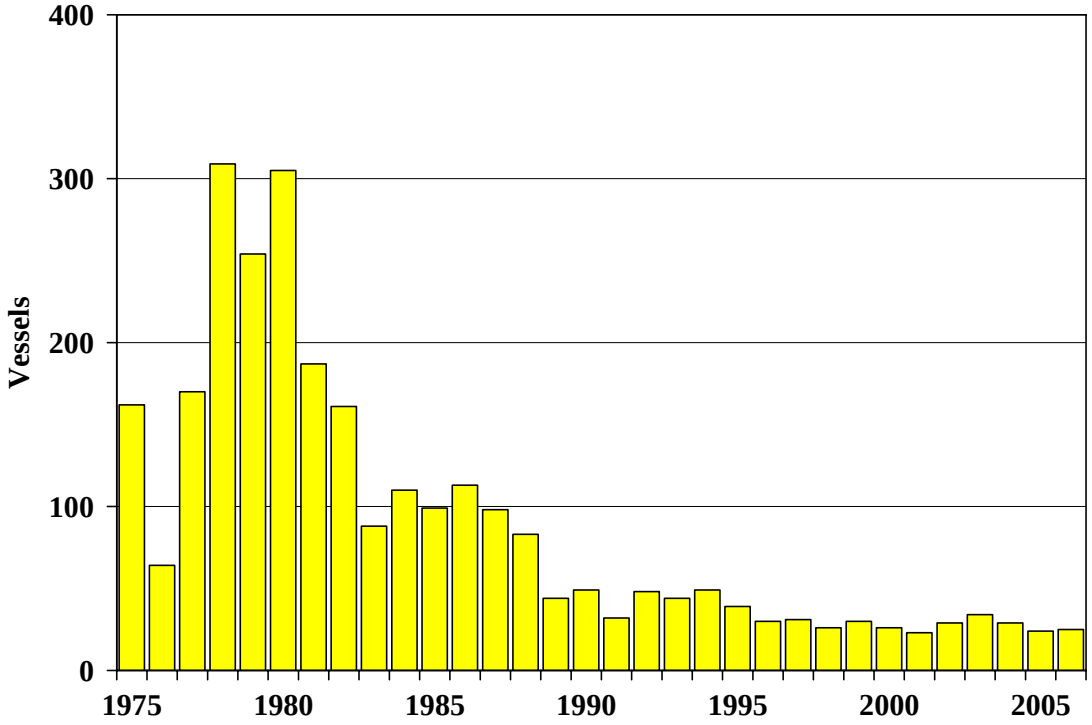

Figure 2. Number of California harpoon vessels, 1975-2006.

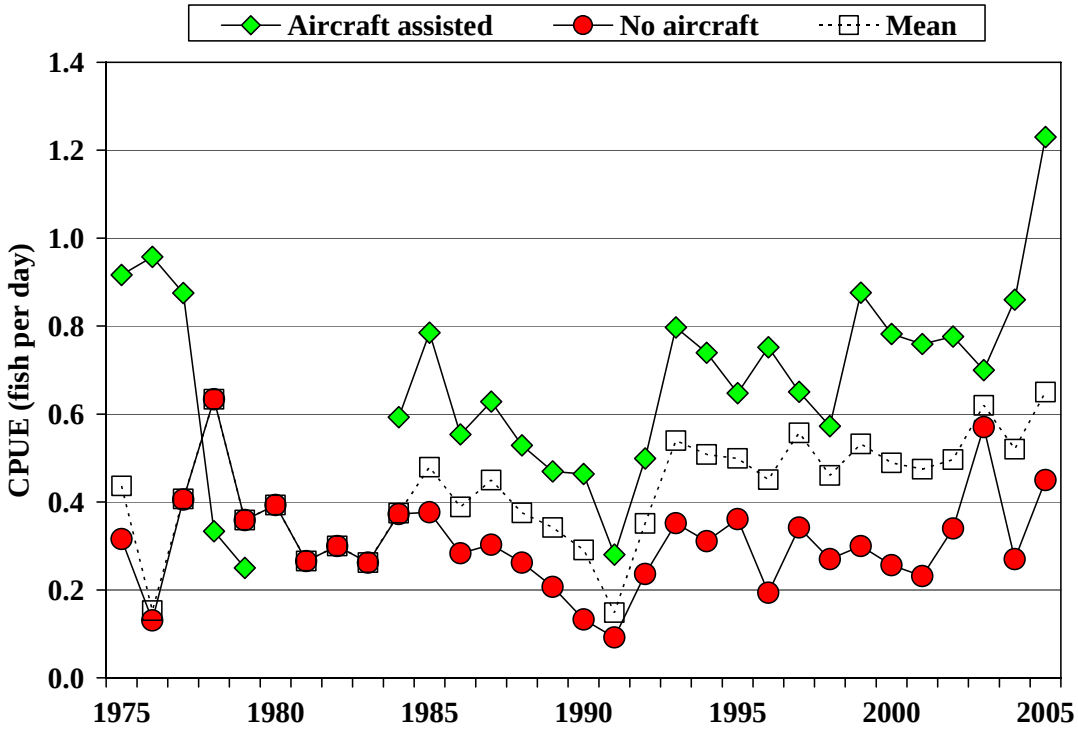

Figure 3. California harpoon fishery swordfish catch-per-unit-effort (CPUE), 1975-2005.

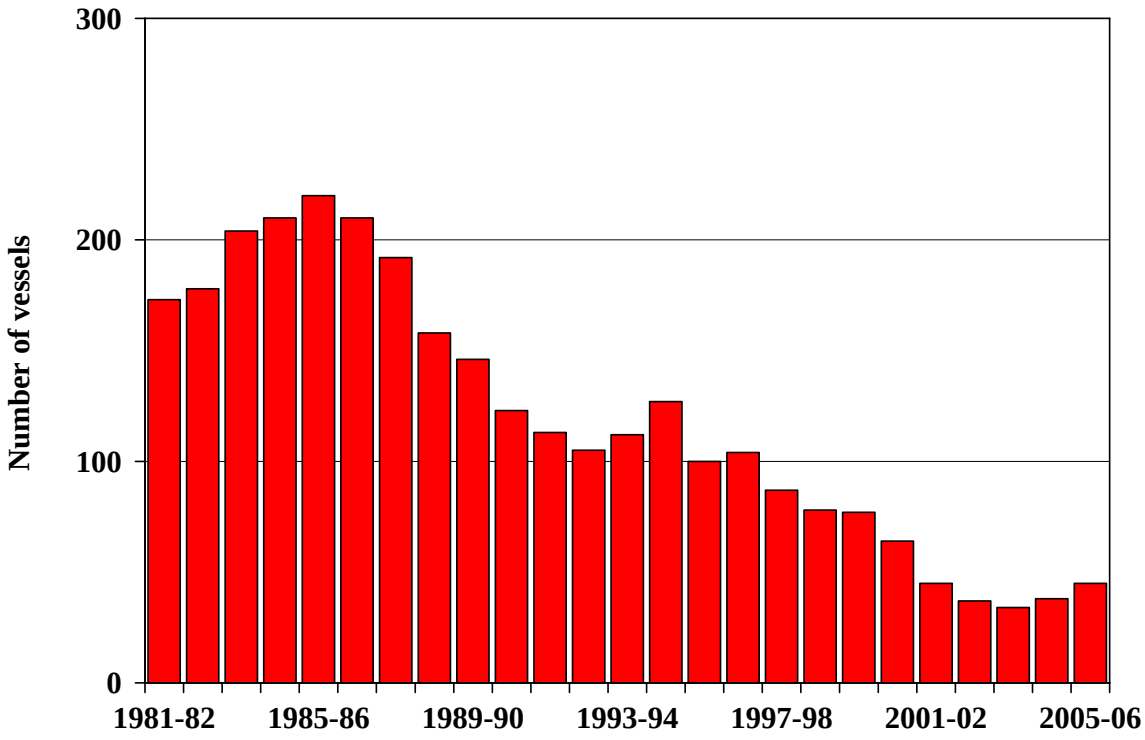

Figure 4. Number of California drift gill net vessel, 1981-1982 to 2005-2006.

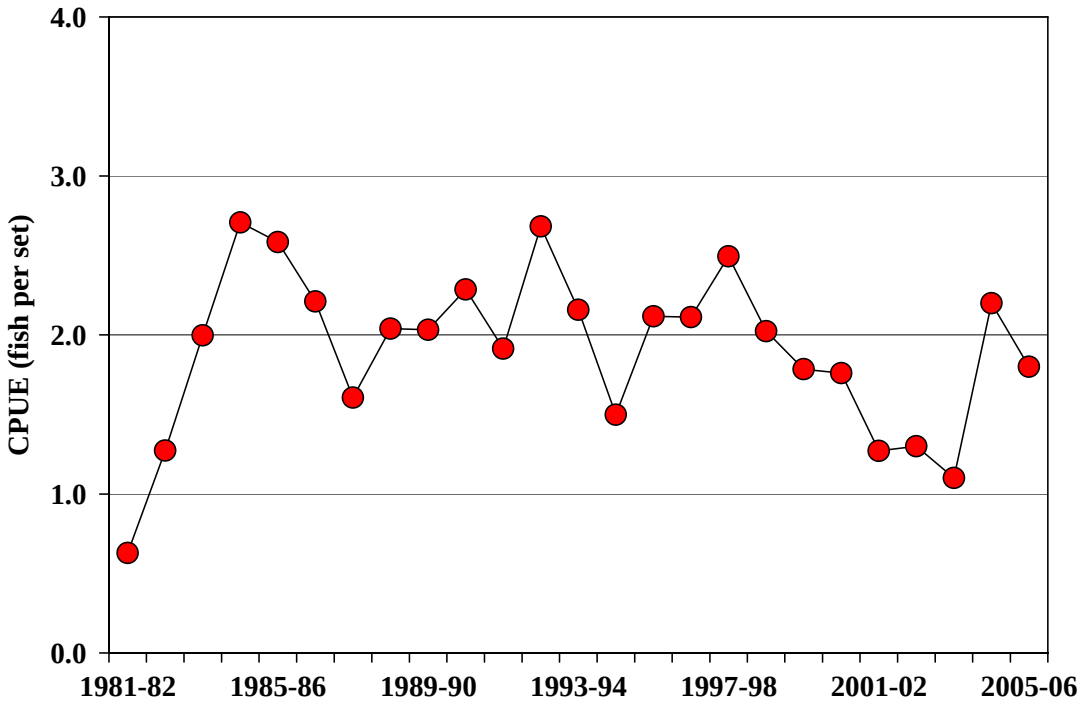

Figure 5. California drift gill net fishery swordfish catch-per-unit-effort (CPUE), 1981-1982 through 2005-2006.

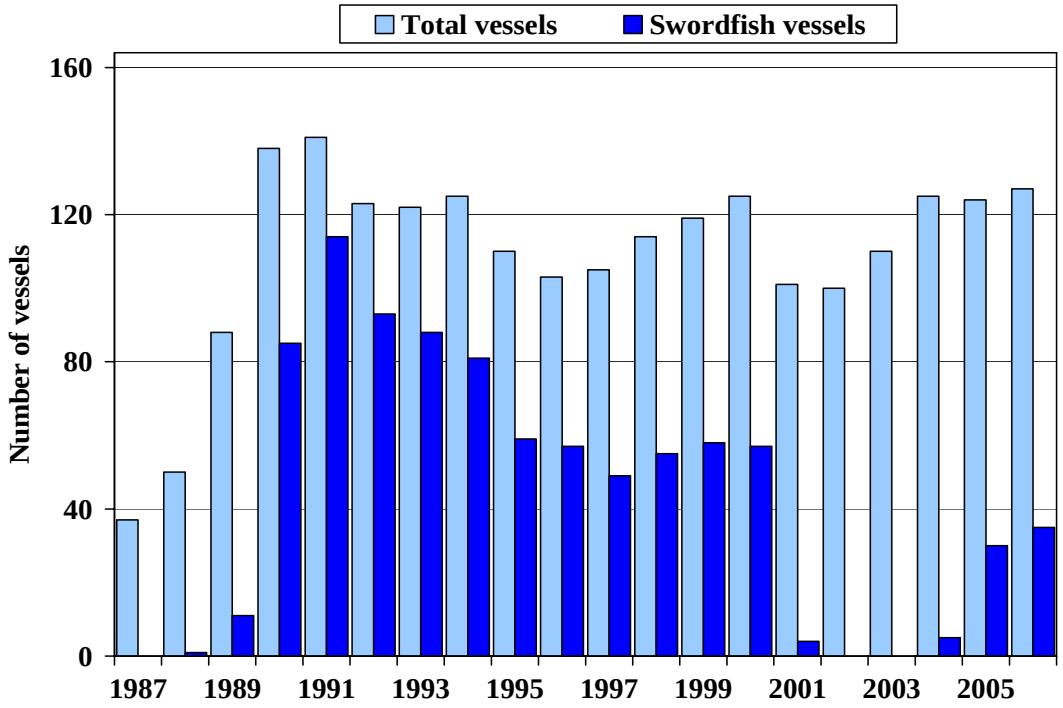

Figure 6. Number of active Hawaii-based longline vessels and longliners targeting swordfish, 1987-

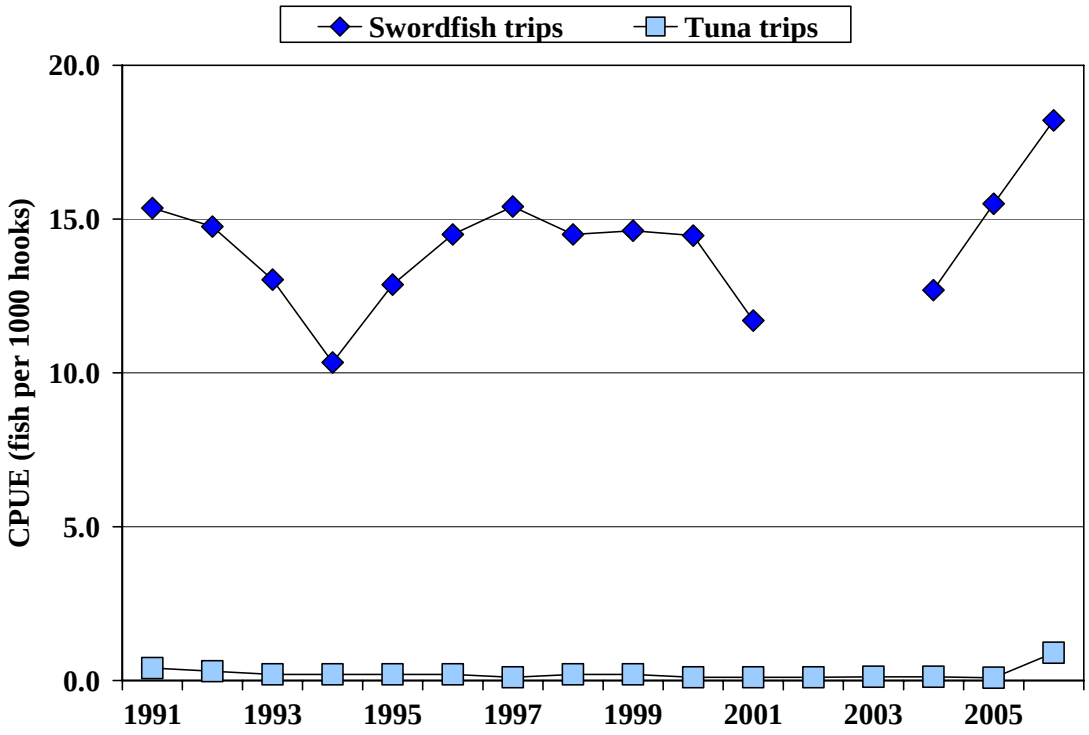

Figure 7. Hawaii-based longline catch-per-unit-effort (CPUE) for swordfish by trip type, 1991-2006.

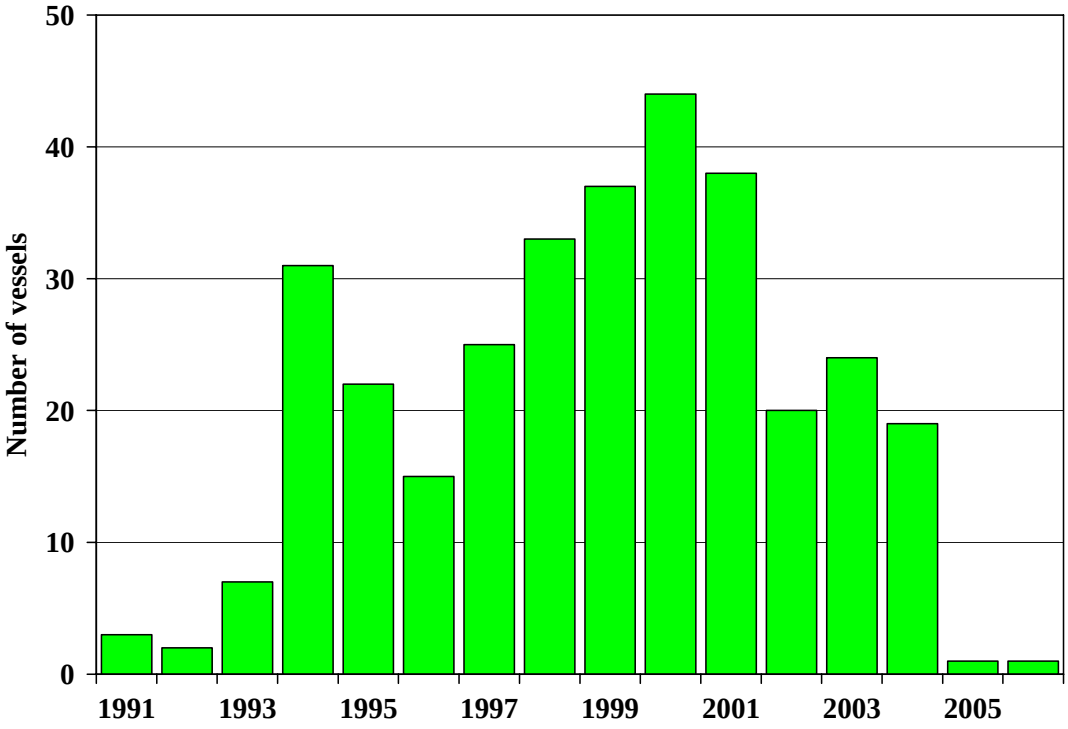

Figure 8. Number of California longline vessels, 1991-2006.

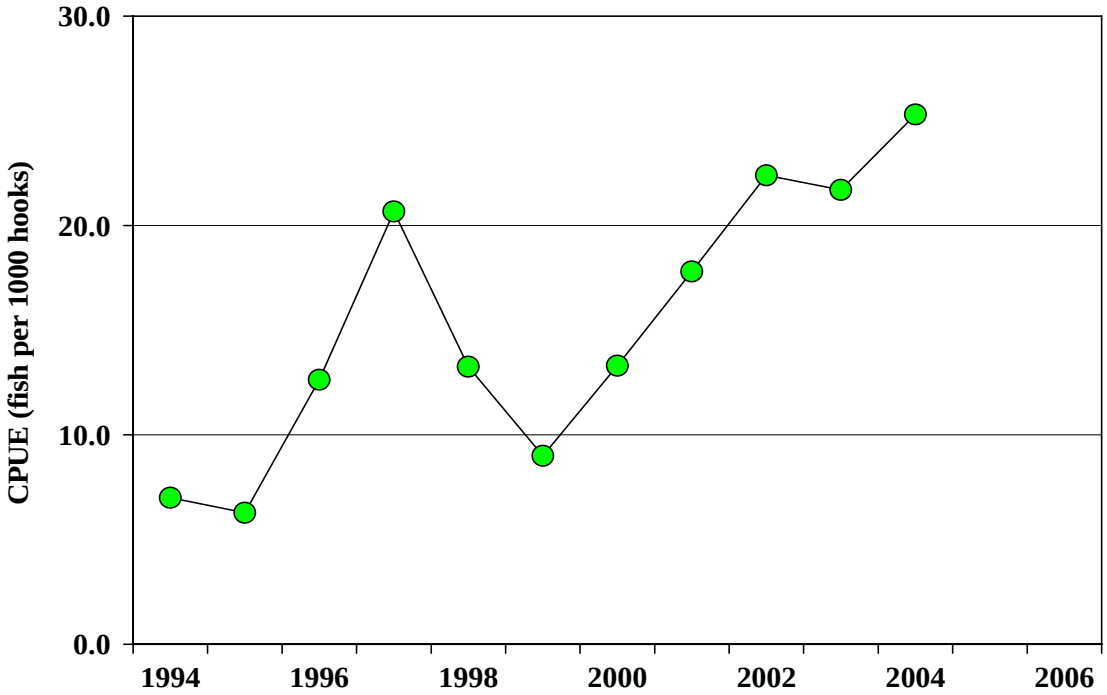

Figure 9. California-based longline catch-per-unit-effort (CPUE), 1994-2004.