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JANUARY 2010

## SUMMARY OF THE 2008 U.S. NORTH AND SOUTH PACIFIC ALBACORE TROLL FISHERIES

by

John F. Childers and Amy E. Betcher

ADMINISTRATIVE REPORT LJ-10-01

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**ADMINISTRATIVE REPORT LJ-01-10**



## TABLE OF CONTENTS

<b>INTRODUCTION.....</b>	<b>1</b>
<b>DATA COLLECTED .....</b>	<b>2</b>
<b>TOTAL CATCH AND EFFORT .....</b>	<b>3</b>
<b>DISTRIBUTION OF CATCHES .....</b>	<b>4</b>
<b>CATCH-PER-UNIT EFFORT .....</b>	<b>4</b>
<b>LOGBOOK SAMPLING COVERAGE.....</b>	<b>5</b>
<b>LENGTH FREQUENCIES.....</b>	<b>5</b>
<b>SUMMARY .....</b>	<b>5</b>
<b>ACKNOWLEDGMENTS .....</b>	<b>6</b>
<b>LITERATURE CITED .....</b>	<b>7</b>

**LIST OF TABLES**

Table 1. North Pacific albacore catches by fishery, 1989-2008 .....8

Table 2. South Pacific albacore catches by fishery, 1989-2008 ..... 10

Table 3. Fishery statistics for the U.S. North Pacific albacore troll fishery .....12

Table 4. Fishery statistics for the U.S. South Pacific albacore troll fishery .....13

**LIST OF FIGURES**

Figure 1. Geographic distribution of albacore catches by the 2008 U.S. North Pacific albacore troll fishery..... 14

Figure 2. Geographic distribution of albacore catches by the 2007-2008 U.S. South Pacific albacore troll fishery ..... 15

Figure 3. CPUEs from the U.S. North and South Pacific albacore troll fisheries from 1961 through 2008 ..... 16

Figure 4. Geographic distribution of albacore CPUEs by 2008 U.S. North Pacific albacore troll fishery ..... 17

Figure 5. Geographic distribution of albacore CPUEs by U.S. troll vessels by the 2007-2008 U.S. South Pacific albacore troll fishery..... 18

Figure 6. Length-frequency histogram of North Pacific albacore caught by U.S. troll vessels during the 2008 season..... 19

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## **INTRODUCTION**

Albacore (*Thunnus alalunga*) is a commercially valuable member of the family Scombridae that is harvested throughout the temperate latitudes of the North and South Pacific Ocean by various fisheries (Table 1). Immature albacore tend to congregate in surface waters along the productive edges of oceanic fronts in the North and South Pacific transition zones (Laurs and Lynn, 1977) where they are targeted by surface fisheries, including the U.S. albacore troll fishery.

A total of 66,166 metric tons (t) of albacore were harvested from the North Pacific in 2008, which is below the average annual harvest of approximately 74,749 t since 1952. Japanese fisheries have traditionally harvested the greatest amount of albacore within the North Pacific, accounting for approximately 72% of the total albacore annual catch from all fisheries. The U.S. albacore fisheries annually harvest approximately 21% of the total North Pacific albacore catch. U.S. troll vessels, using artificial lures with barbless hooks, have fished for albacore in the North Pacific since the early 1900's (Clemens and Craig, 1965). This fishery has been the dominant producer of albacore in all U.S. fisheries in the North Pacific.

Cooperative fishing surveys between National Marine Fisheries Service (NMFS) and the American Fishermen's Research Foundation (AFRF) began in 1971 which led to the expansion of the U.S. troll fishery to areas north of Hawaii and west of the International Dateline (Laurs, et al., 1975b). In recent years, the North Pacific albacore troll season has begun as early as mid-April in areas northwest of Midway Atoll. In July and August, fishing effort expands to the east, towards the west coast of North America. Fishing areas along the west coast of North America extend from Vancouver Island, Canada to southern California. Fishing can continue into November if weather permits and albacore remain available to troll gear.

Albacore is also harvested in the South Pacific by several nations (Table 2). Chinese-Taipei harvests the largest proportion of albacore caught annually in the South Pacific (37% since 1963). The annual U.S. portion of the South Pacific albacore catch has averaged 7% since its inception in 1986. U.S. troll vessels began exploratory fishing operations for albacore in areas east of New Zealand in 1986, which lead to the development of the U.S. albacore troll fishery in the South Pacific (Laurs et al., 1987) during the austral summer months (November through April). 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 albacore season and travel to

American Samoa or Tahiti to prepare for the South Pacific season. The U.S. albacore troll fishing areas in the South Pacific extend eastward from the International Dateline to approximately 120°W between 30°S and 50°S. At the end of the season (March or April), most U.S. troll vessels unload in American Samoa, Fiji, or Tahiti and then travel to Hawaii or the U.S. west coast to prepare for the next North Pacific fishing season.

This report presents summaries of the catch, logbook, and length-frequency information collected from the U.S. albacore troll fleet during the 2008 North Pacific and the 2007-2008 South Pacific albacore fishing seasons. Data from previous North Pacific seasons, South Pacific seasons, and from other fisheries (where available) are included for comparison. Electronic copies of this report, and for the years 1995 to 2007, are available on the internet at <http://swfsc.noaa.gov/FRD-CommercialFisheries.aspx>. Agencies currently involved in the collection of logbook, length-frequency, and catch information from U.S. Pacific albacore troll fisheries are NMFS's Southwest Fisheries Science Center (SWFSC), Southwest Regional Office (SWRO), Pacific Islands Fisheries Science Center (PIFSC), Pacific Islands Regional Office (PIRO), Western Fishboat Owners Association (WFOA), American Fishermen's Research Foundation (AFRF), American Albacore Fishing Association (AAFA), Pacific States Marine Fisheries Commission (PSMFC), the Pacific Coast Fisheries Information Network ([PacFIN](#)), foreign fishery agencies where troll vessels unload and the state fisheries agencies of California, Oregon, and Washington.

## **DATA COLLECTED**

Total annual catch data from the various fisheries that harvest albacore in the Pacific Ocean are available from 1952 to 2008. Daily catch and effort data are obtained directly from logbooks submitted by albacore fishermen. The collection of logbook and catch data from the South Pacific fishery began in 1987. The collection of voluntary logbook data from the U.S. North Pacific albacore troll fishery began in 1954 (Lauri et al., 1975a). The U.S. West Coast Highly Migratory Species Fisheries Management Plan (HMS FMP) was implemented in April, 2005. This HMS FMP requires all U.S. fishing vessels targeting highly migratory species (including albacore) in the Pacific to obtain a federal permit and submit copies of their fishing logbook to NMFS for each trip.

Samplers in the ports of Ilwaco, Washington; Newport, Astoria, and Charleston, Oregon; and Pago Pago, American Samoa collect length-frequency data by measuring albacore as they are unloaded from catcher vessels. This sampling of length-frequency data from the U.S. North Pacific albacore troll fishery began in 1951. The collection of length-frequency data from the U.S. South Pacific albacore troll fishery began in 1987.

Catch-Per-Unit Effort (CPUE) is used as an indication of relative abundance of albacore available to troll gear, or a measure of fishing success. It is expressed in numbers of fish caught per day fished for the U.S. troll fishery. Catch (in numbers of fish) and effort (in days fished) from logbook data were summarized by 10-day and 1°-square area strata in which there was at least one day of fishing effort in a stratum (Kleiber and Perrin, 1991). Average CPUE is calculated as follows:

$$\text{Average CPUE} = \frac{\sum_{i=1}^n \frac{C_i}{E_i}}{n}$$

Where  $C_i$  is the total sampled catch in the  $i^{\text{th}}$  stratum,  $E_i$  is the total sampled effort in the  $i^{\text{th}}$  stratum, and  $n$  is the total number of strata. Annual fishing effort in the albacore troll fisheries is measured in number of fishing days, and is estimated by the following equation:

$$\text{Effort}(\text{days}) = \text{Catch}(\text{pounds}) \div [\text{CPUE}(\text{fish}/\text{day}) \times \text{AverageWeight}(\text{pounds}/\text{fish})]$$

Logbook sampling coverage is expressed as the ratio of catch from sampled trips (those trips from which logbook data were received) to total catches (Tables 3 and 4). Total catch from each trip is not completely available from past seasons. For consistent comparison of sampling coverage between seasons, sampled catch is estimated by multiplying numbers of fish caught by the average weight of those fish (recorded in logbooks) and summing these estimates from sampled logbooks. If logbooks were submitted from all trips, logbook sampling coverage is estimated to be 100% for that season.

Length-frequency sampling coverage is expressed as the ratio of the number of fish sampled (measured) to the total estimated number of fish landed for the season. The total number of fish landed for the season is estimated by dividing total catch by the average weight of fish landed. The length-weight relationship for North Pacific albacore from Bartoo and Foreman (1993) was used to estimate weights from fork lengths.

## TOTAL CATCH AND EFFORT

Total catch from the U.S. North Pacific albacore troll fishery decreased 14% from 11,887 t in 2007 to 10,254 t in 2008 (Table 1). An estimated 482 U.S. troll vessels fished in the 2008 North Pacific fishery (Table 3), a 28% decrease from 672 troll vessels that fished in 2007. U.S. troll vessels fished an estimated 20,582 days during the 2008 North Pacific albacore season, a decrease from the 24,000 days fished in 2007. The average price paid for albacore caught by troll vessels in 2008 was \$2,360 per short ton (\$1.18 per pound). This is a 27% increase from the average price of \$1,860 per short ton (\$0.93 per pound) paid in 2007.

Since the South Pacific albacore troll fishery begins in November or December and can continue into April of the following year, total annual landings are computed differently than total seasonal landings. Annual totals (Table 2) are a combination of catches from portions of two consecutive South Pacific albacore seasons. The annual catch of South Pacific albacore by U.S. troll vessels decreased 46% from 272 t in 2007 to 148 t in 2008 (this value does not include catches made in December, 2008). Seasonal totals (Table 4) include catches that occurred between November and April of the following year. The 2007-2008 season catch by U.S. troll vessels decreased 35% to 150 t from 230 t in the 2006-2007 season (Table 4). Three U.S. troll vessels participated in the 2007-2008 South Pacific fishery, three vessels fewer than the number that fished in the 2006-2007 season. Total fishing effort has declined since the 2002-2003 season. Market conditions, increased fuel costs, and availability of fish have all contributed to this decline. Effort for the 2007-2008 South Pacific albacore season is estimated at 239 days, a significant decrease from the 813 days fished in the 2006-2007 season.

Albacore may be discarded during a fishing trip because they are undersized (less than 58 cm fork length or 9 pounds), damaged, or have spoiled due to refrigeration problems. During the 2008 North Pacific troll season, 131 trips (of 1,157 sampled trips) recorded a total of 8,486 albacore discarded. During the 2007-2008 South Pacific troll season, four trips recorded a total of thirteen albacore discarded. Albacore troll vessels catch minor amounts of other pelagic fish species that are usually caught during transit to or from the fishing grounds. The most common species that are incidentally caught include skipjack tuna (*Katsuwonus pelamis*), mahi mahi (*Coryphaena hippurus*), yellowtail (*Seriola lalandi*), Eastern Pacific bonito (*Sarda chiliensis*), bigeye tuna (*Thunnus obesus*), and bluefin tuna (*Thunnus thynnus*).

### **DISTRIBUTION OF CATCHES**

Based on logbook data from the 2008 U.S. North Pacific albacore troll fishery, the general fishing area extended from 160°W to the west coasts of the U.S. and Canada, between approximately 25°N and 55°N (Figure 1). The offshore troll fishery was relatively unproductive in 2008. The highest catch areas along the west coast were off Oregon and Washington from 44°N to 47°N, between 124°W and 128°W and from 40°N to 41°N, between 136°W to 137°W.

Albacore catches recorded during the 2007-2008 South Pacific season were summarized by 5° squares of latitude and longitude (Figure 2). The highest albacore catches of the season were made between 155°W and 160°W, from 40°S to 45°S.

### **CATCH-PER-UNIT EFFORT**

The average CPUE for the North Pacific albacore troll fishery declined by approximately 68% between 1962 and 1977, then remained relatively stable between 1977 and 1991 (Figure 3). The CPUE increased between 1991 and 1998 with large fluctuations between 1995 and 1999. CPUE gradually increased up to 79 fish per day between 2000 and 2004, dropped considerably to 46 fish per day in 2005, but increased approximately 89% in 2006 to 87 fish per day. The CPUE decreased slightly in 2008 to 71 fish per day, from 70 fish per day in 2007. The ten-year average from 1999 through 2008 is 63 fish per day. CPUEs were summarized by 1°x1° squares of latitude and longitude for the 2008 North Pacific season (Figure 4). The highest CPUEs for the 2008 North Pacific season ranged from 174 to 552 fish per day. These CPUEs were located between 127°W and 128°W, from 43°N to 48°N and between 134°W and 137°W, from 40°N to 41°N.

The average CPUE for the U.S. South Pacific albacore troll fishery declined between 1987 and 1993, followed by a peak of 147 fish per day in 1995 (Figure 3). The CPUE remained relatively stable around 68 fish per day through 2000. CPUE values were highly variable between 2000 and 2005. The CPUE for the 2007-2008 season is 51 fish per day, 22% less than 65 fish per day in the 2006-2007 season. The ten-year average for CPUE in the South Pacific from 1999 through 2008 is 62 fish per day. CPUE values for the 2007-2008 season were summarized by 5°x5° squares of latitude and longitude (Figure 5). The highest values ranged from 84 fish per day to 137 fish per day and were located between 155°W and 160°W, from 40°S to 45°S.

## **LOGBOOK SAMPLING COVERAGE**

Despite the new mandatory logbook submission requirements established under the HMS FMP, not all of the logbooks were received from all of the trips that were completed by U.S. troll vessels in 2008. Logbooks were received from 1,157 trips (of an estimated 1,498 total trips) completed during the 2008 North Pacific albacore troll season. Estimated catches from submitted logbooks totaled 8,377 tons, resulting in a logbook sampling coverage rate of 82% (Table 3).

Logbook data from the 2007-2008 South Pacific albacore troll season were collected from all four trips made by U.S. vessels. Estimated catches from submitted logbooks totaled 150 tons, resulting in a logbook sampling rate of 100% (Table 4).

## **LENGTH FREQUENCIES**

Port samplers measured 27,432 albacore out of an estimated 1,461,323 albacore landed during the 2008 North Pacific season, resulting in a length-frequency sampling coverage of 1.9% (Table 3). This is the same sampling coverage as 2007. Fork lengths of sampled albacore ranged from 50 cm (5.7 lb or 2.6 kg) to 102 cm (47.8 lb or 21.7 kg) and averaged 70 cm (15.5 lb or 7 kg; Table 3). The histogram of length-frequency samples from the 2008 North Pacific season has a bimodal distribution with peaks at 65 cm (12.4 lb or 5.6 kg) and 75 cm (19 lb or 8.6 kg; Figure 6). The majority of albacore that are taken in both the North and South Pacific troll fisheries range from three to five years old. Small albacore (less than 58 cm fork length) may not be adequately represented in the length-frequency data collected from the North Pacific fishery due to discarding of small fish.

Due to the inaccessibility of fish for sampling, port samplers did not measure any of the estimated 23,416 albacore landed during the 2007-2008 South Pacific troll season (Table 4). The length-frequency sampling coverage rate for the 2006-2007 season is 0.2%.

## **SUMMARY**

Total landings from the 2008 U.S. North Pacific albacore troll fishery decreased by 14% from the previous year's fishery. A total of 482 vessels landed 10,254 t during the 2008 season compared to 672 vessels that landed 11,887 t in 2007. The most successful catch areas ranged from 44°N to 47°N, between 124°W and 128° and from 40°N to 41°N, between 136°W to 137°W. Total effort decreased to 20,582 days in 2008. The average CPUE for the 2008 North Pacific season increased slightly from 70 fish per day in 2007 to 71 fish per day. Logbook sampling coverage for the North Pacific albacore fishery decreased from 85% in the 2007 season to 82% in 2008. The average fork length of albacore measured during the 2008 North Pacific season is 70 cm (15.5 lb or 7 kg), although fish less than 58 cm fork length (9 lb or 4.0 kg) may not be adequately represented in the North Pacific length-frequency samples. Length-frequency sampling coverage during 2008 remained the same as in the 2007 season (1.9%).

Total catch from the 2007-2008 South Pacific season decreased from 271 t in the 2006-2007 season to 150 t. The annual catch decreased from 272 t in 2007 to 148 t in 2008. Three U.S. troll vessels fished 239 days in the 2007-2008 season compared to six vessels that fished

813 days in the 2006-2007 season. The areas of highest catch for the 2007-2008 South Pacific season ranged between 155°W and 160°W, from 40°S to 45°S. The CPUE for the 2007-2008 season slightly decreased from 65 fish per day in the 2006-2007 season to 51 fish per day. The distribution of CPUEs in the 2007-2008 South Pacific season was the same as the distribution of catch. Logbook sampling coverage for the 2007-2008 South Pacific albacore troll fishery increased to 100% from 85% in the 2006-2007 season. No albacore were available for length sampling during the 2007-2008 South Pacific season.

### **ACKNOWLEDGMENTS**

We thank the albacore fishermen who submit their logbook data and who made this report possible. WFOA and AAFA provided catch data. Carla Sowell (Oregon Department of Fish & Wildlife), Dale Sweetnam (California Department of Fish & Game), Wendy Beeghley (Washington Department of Fish & Wildlife), Russell Porter (Pacific States Marine Fisheries Commission), and Gordon Yamasaki (PIRO in Pago Pago, America Samoa) coordinated the collection of length-frequency and catch data, as well as other fishery-related information. We are indebted to the port samplers for their efforts in collecting fisheries data from U.S. troll vessels and for distributing copies of the U.S. Pacific Albacore Logbook.

The member nations of the International Scientific Committee, Western and Central Pacific Fisheries Commission and many other foreign colleagues provided catch information from the albacore fisheries in their respective countries.

Henry Orr (SWFSC) produced the illustrations for this report. Gary Sakagawa, Russell Ito, and Darryl Tagami provided helpful directions, comments, and critiques of the manuscript.

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**Table 1. North Pacific albacore catches (in metric tons) by fisheries, 1989-2008 <sup>1</sup>. Blank indicates no effort. -- indicates data not available. 0 indicates less than 1 metric ton. Provisional estimates in ().**

Year	Japan							Korea		Chinese-Taipei			
	Purse Seine	Gill Net	Set Net	Pole and Line	Troll	Longline	Other	Gill Net	Longline	Gill Net	Distant Water Longline	Offshore Longline	
1989	2,521	7,437	33	8,629	--	13,031	433	1,023	27	8,350		40	
1990	1,995	6,064	5	8,532	--	15,785	248	1,016	1	16,701		4	
1991	2,652	3,401	4	7,103	--	17,039	395	852	0	3,398		12	
1992	4,104	2,721	12	13,888	--	19,042	1,522	271	1	7,866		--	
1993	2,889	287	3	12,797	--	29,933	897		21			5	
1994	2,026	263	11	26,389	--	29,565	823		54			83	
1995	1,177	282	28	20,981	856	29,050	78		14			4,280	
1996	581	116	43	20,272	815	32,440	127		158			7,596	
1997	1,068	359	40	32,238	1,585	38,899	135		404			9,119	337
1998	1,554	206	41	22,926	1,190	35,755	104		226			8,617	193
1999	6,872	289	90	50,369	891	33,339	62		99			8,186	207
2000	2,408	67	136	21,550	645	29,995	86		15			7,898	944
2001	974	117	78	29,430	416	28,801	35		64			7,852	832
2002	3,303	332	109	48,454	787	23,585	85		112			7,055	910
2003	627	126	69	36,114	922	20,907	85		146			6,454	712
2004	7,200	61	30	32,255	772	17,341	54		78			4,061	927
2005	850	154	97	16,133	665	20,420	234		420			3,990	483
2006	364	221	55	15,400	460	21,027	42		138			3,848	469
2007	5,682	226	30	37,768	519	22,386	(42)		56			2,465	451
2008	(1,033)	(226)	(30)	(19,577)	(519)	(22,386)	(42)		(365)			(2,490)	(579)

<sup>1</sup> Data are from the ISC albacore working group, July 15 2008 except as noted.

Table 1 (Continued).

Year	United States								Mexico		Canada	Other		Grand Total
	Purse Seine	Gill Net	Pole and Line	Albacore Troll <sup>2</sup>	Tropical Troll & Handline	Sport <sup>3</sup>	Longline	Other	Purse Seine	Pole and Line <sup>4</sup>	Troll	Troll <sup>5</sup>	Longline <sup>6</sup>	
1989	1	4	54	1,860	36	160	248	23	2	0	140			44,052
1990	71	29	115	2,603	15	24	177	4	2	0	302			53,693
1991	0	17	0	1,845	72	6	312	71	2	0	139			37,320
1992	0	0	0	4,572	54	2	334	72	10	0	363			54,833
1993		0	0	6,254	71	25	438		11	0	494			54,125
1994		38	0	10,978	90	106	544	213	6	0	1,998	158		73,345
1995		52	80	8,045	177	102	882	1	5	0	1,763	94		67,947
1996	11	83	24	16,938	188	88	1,185		21	0	3,316	469	1,735	86,207
1997	2	60	73	14,252	133	1,018	1,653	1	53	0	2,168	336	2,824	106,756
1998	33	80	79	14,410	88	1,208	1,120	2	8	0	4,177	341	5,871	98,229
1999	48	149	60	10,060	331	3,621	1,542	1	0	57	2,734	228	6,307	125,542
2000	4	55	69	9,645	120	1,798	940	3	70	33	4,531	386	3,654	85,052
2001	51	94	139	11,210	194	1,635	1,295		5	18	5,248	230	1,471	90,189
2002	4	30	381	10,387	235	2,357	525		28	0	5,379	466	700	105,224
2003	44	16	59	14,102	85	2,214	524		28	0	6,861	378	(2,400)	92,804
2004	1	12	127	13,346	157	1,506	361		104	0	7,856	--	(2,400)	88,620
2005		20	66	8,413	175	1,719	296		0	0	4,845	--	(2,400)	61,284
2006		3	23	12,524	95	385	270		109	0	5,832	--	(2,400)	63,610
2007		4	21	11,887	98	1,225	250		40	0	6,075	--	(2,400)	91,625
2008		(1)	(6)	(10,254)	(29)	(381)	(359)	(1)	(10)		(5,478)		(2,400)	(66,166)

<sup>2</sup> Albacore troll catches contain an unknown proportion of pole and line catch.

<sup>3</sup> Sport and Other catches combined for 2007 due to confidentiality policies.

<sup>4</sup> Mexico Pole and line catches for 1999 and 2000 include 34 and 4 metric tons, respectively from longline.

<sup>5</sup> Other troll catches are from vessels registered in Belize, Cook Islands, Tonga, and Ecuador.

<sup>6</sup> Updates for Other Longline not available.

**Table 2. South Pacific albacore catches (in metric tons) by fisheries, 1989-2008 <sup>1</sup>. Blank indicates no effort. -- indicates data not available. 0 indicates less than 1 metric ton. Provisional estimates in ().**

YEAR	JAPAN			CHINESE-TAIPEI		KOREA		NEW ZEALAND			FRENCH POLYNESIA		AUSTRALIA	
	GILL NET	LONG <sup>2</sup> LINE	POLE & LINE	GILL NET	LONG LINE	GILL NET	LONG LINE	LONG LINE	POLE & LINE	TROLL <sup>3</sup>	LONG LINE	TROLL <sup>4</sup>	LONG LINE	TROLL <sup>5</sup>
1989	13,263	5,446		8,520	10,827	172	1,178	9		4,361		102	556	13
1990	5,567	5,590		1,859	11,621		690	170	242	2,599	20	355	269	15
1991		4,858		1,394	16,517		536	85	9	2,365	100	391	225	20
1992		5,482			22,229		1,343	209	6	3,272	195	115	320	70
1993		8,480	12		18,469		558	345	60	2,982	714	86	312	55
1994		9,080	2		19,726		1,073	635	62	4,620	913	61	400	70
1995		7,758			15,316		1,184	810	136	5,349	772	255	457	25
1996		4,493	27		10,858		1,020	1,079	26	5,241	1,463	153	408	50
1997		4,797	12		10,156		1,144	847		2,781	2,595	102	258	50
1998		7,781	27		10,532		4,484	2,057	1	4,468	3,189	38	478	60
1999		3,829	100		10,418		733	2,103		1,800	2,580	61	373	50
2000		2,992	22		10,235		589	1,344	72	3,336	3,473	97	381	50
2001		4,883	18		12,330		2,101	2,614	4	2,738	4,261	155	591	59
2002		5,414	11		12,796		3,742	2,545		3,015	4,557	106	553	52
2003		4,393	7		14,105		2,741	2,971		3,730	3,846	84	490	51
2004		5,633	104		13,307		1,660	1,248	0	3,221	2,218	71	667	53
2005		6,473	17		11,168		4,137	602	2	2,855	2,426	83	743	54
2006		5,046	6		10,449		1,346	496	3	2,043	2,918	158	2,591	50
2007		5,083	(6)		9,878		1,237	357		1,736	3,957	20	1,925	50
2008		(5,083)	(6)		(7,909)		(1,237)	(390)		(3,349)	(3,068)	(26)	(1,275)	(50)

<sup>1</sup> Data are from the Western and Central Pacific Fisheries Commission Tuna Fishery Yearbook data files (<http://www.spc.int/oceanfish/Html/Statistics/Yearbook/index.htm>), except as noted.

<sup>2</sup> 1989-1995 Japan longline catches include catches from Australia-Japan joint venture vessels.

<sup>3</sup> 1990-2008 New Zealand troll include unclassified vessels. Troll catches are seasonal estimates (November through May).

<sup>4</sup> French Polynesia troll catches include catches from troll, pole and line, and other gears.

<sup>5</sup> 1989-2008 Australia troll catches include recreational catches.

Table 2 (Continued).

YEAR	U.S.		CANADA	COOK ISLANDS		NEW CALEDONIA	TONGA	FIJI	WESTERN SAMOA	SOLOMON ISLANDS	VANUATU	PAPUA NEW GUINEA	CHINA	GRAND TOTAL
	LONG LINE	TROLL	TROLL	LONG LINE	TROLL	LONG LINE	LONG LINE	LONG LINE	LONG LINE	LONG LINE	LONG LINE	LONG LINE	LONG LINE	
1989		3,672	235			566	195	3						49,118
1990		3,886	235			1,053	152	68					4	34,395
1991	1	4,894	235			909	171	208						32,918
1992		2,956	235			692	199	243						37,566
1993	1	1,010	235			755	231	463		213			1	34,982
1994	2	2,270	235	16		840	343	842		641		0	8	41,839
1995	36	1,951	235	25	8	332	379	702	1,883	24	109	6	5	37,757
1996	87	1,947	136	5	12	414	431	1,446	1,775	100	192	38	8	31,409
1997	310	1,739	149			277	493	1,842	4,108	109	95	101	2	31,967
1998	452	1,618	167		22	860	616	2,121	4,742	370	10	104	1	44,198
1999	339	1,339	253		28	690	801	2,279	4,027	136		129	3,473	35,541
2000	626	2,433	351		149	895	862	6,065	4,067	224		159	2,056	40,478
2001	3,233	2,107	206	2	91	1,020	1,268	7,971	4,820	54	655	124	2,711	54,015
2002	5,951	1,337	144	490	79	1,165	1,189	8,026	4,223	121	6,756	142	2,920	65,334
2003	3,931	1,574		1,358	316	1,111	611	6,881	2,253	95	4,903	857	6,223	62,531
2004	2,462	960	63	1,869	293	1,468	182	11,290	1,233	207	6,558	1,681	6,104	62,552
2005	2,936	487	72	2,371	37	1,590	283	8,901	1,263	0	8,290	2,256	4,103	61,149
2006	4,078	585	135	2,223	120	1,358	414	11,802	2,113	(0)	8,649	1,811	7,191	(65,585)
2007	5,183	272	27	2,099	47	1,324	390	7,145	3,113	(0)	8,004	1,598	5,453	(58,904)
2008	(3,589)	(148)	(27)	(1,905)	(47)	(1,506)	(220)	(7,650)	(2,342)	(0)	(6,278)	(464)	(5,453)	(52,022)

Table 3. Fishery statistics for the U.S. North Pacific albacore troll fishery.<sup>1</sup>

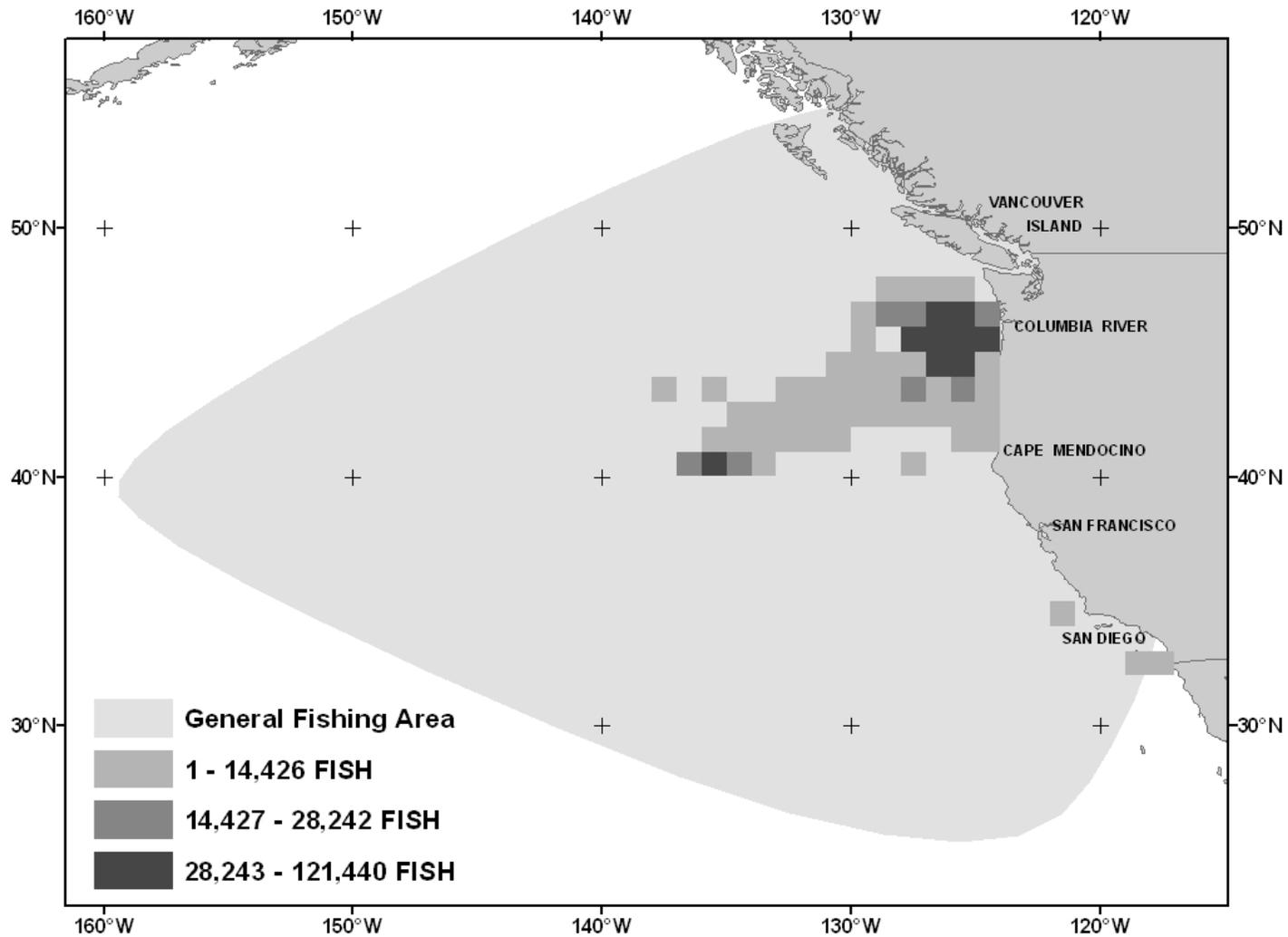
FISHING SEASON	NO. TRIPS		CATCH (Metric Tons)		NO. FISH LANDED		AVG FL (cm)	AVG WT (lb)	EFFORT		CPUE (fish/day)	SAMPLING COVERAGE	
	TOTAL	SAMPLED	TOTAL	SAMPLED	TOTAL	MEASURED			NO. DAYS	NO. VESSELS		LOG	L-F
1989	821	169	1,860	412	322,577	9,351	65.5	12.7	11,566	338	28	22%	2.9%
1990	845	211	2,603	1,466	366,311	20,963	70.3	15.7	10,047	368	36	56%	5.7%
1991	536	118	1,845	1,246	317,523	11,429	65.7	12.8	9,000	172	35	68%	3.6%
1992	1,590	300	4,572	1,940	857,359	25,053	63.8	11.8	17,202	602	50	42%	2.9%
1993	1,704	175	6,254	1,390	810,921	204	72.2	17.0	21,533	608	38	22%	0.0%
1994	2,135	407	10,978	4,534	1,611,968	1,067	69.3	15.0	25,979	721	62	41%	0.1%
1995	1,094	354	8,045	5,031	1,172,692	15,283	69.4	15.1	26,014	471	45	63%	1.3%
1996	1,816	413	16,938	7,049	2,919,910	32,144	65.6	12.8	32,694	676	89	42%	1.1%
1997	4,000	496	14,252	5,437	2,049,663	31,223	69.7	15.3	45,477	1,172	45	38%	1.5%
1998	2,358	272	14,410	5,061	2,217,113	15,603	68.2	14.3	21,253	841	104	35%	0.7%
1999	2,555	393	10,060	3,549	1,251,528	14,263	73.2	17.7	35,454	776	35	35%	1.1%
2000	1,880	425	9,645	3,991	1,444,407	11,636	68.8	14.7	37,752	753	38	41%	0.8%
2001	2,824	481	11,210	5,489	1,692,367	14,807	68.6	14.6	25,771	964	66	49%	0.9%
2002	1,868	355	10,387	3,971	1,687,286	12,348	67.0	13.6	25,274	716	67	38%	0.7%
2003	2,370	370	14,102	5,088	1,623,719	11,863	75.1	19.1	21,621	798	75	36%	0.7%
2004	2,400	569	13,346	6,221	2,060,653	33,816	68.1	14.3	26,197	737	79	47%	1.6%
2005	1,574	1,152	8,413	6,153	1,142,555	23,219	71.1	16.2	24,731	565	46	73%	2.0%
2006	1,857	1,459	12,524	11,585	1,905,266	32,260	68.4	14.5	22,006	623	87	93%	1.7%
2007	2,212	1,722	11,887	10,157	1,679,972	32,591	70.2	15.6	24,000	672	70	85%	1.9%
2008	1,498	1,157	10,254	8,377	1,461,323	27,432	70.0	15.5	20,582	482	71	82%	1.9%

<sup>1</sup> Albacore troll catches contain an unknown proportion of pole and line catch.

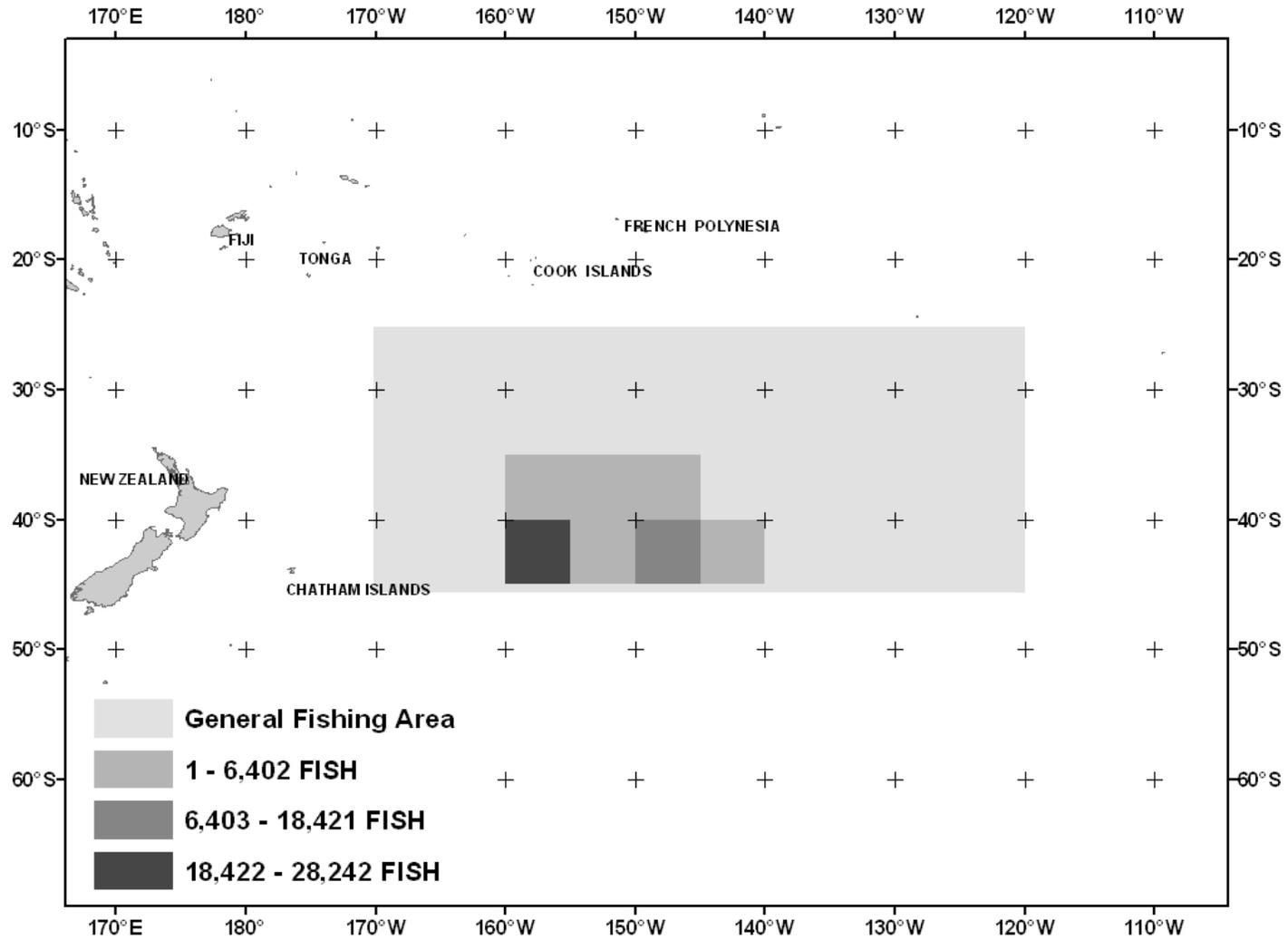
**Table 4. Fishery statistics for the U.S. South Pacific albacore troll fishery. Values in italics may be adversely impacted by low length-frequency sampling coverage (< 0.2%).**

FISHING SEASON	NO. TRIPS		CATCH <sup>1</sup> (Metric Tons)		NO. FISH LANDED		AVG FL (cm)	AVG WT (lb)	EFFORT		CPUE (fish/day)	SAMPLING COVERAGE	
	TOTAL	SAMPLED	TOTAL	SAMPLED	TOTAL	MEASURED			NO. DAYS	NO. VESSELS		LOG	L-F
1988-1989	80	37	3,239	1,900	461,109	5,441	70	15.5	3,742	43	123	59%	1.2%
1989-1990	76	61	3,995	3,419	620,541	3,480	68	14.2	3,537	39	175	86%	0.6%
1990-1991	78	58	5,221	4,787	705,410	10,308	71	16.3	6,997	56	101	92%	1.5%
1991-1992	65	38	3,097	1,955	470,227	4,758	68	14.5	6,867	55	68	63%	1.0%
1992-1993	45	8	1,036	195	199,519	1,720	63	11.4	4,687	44	43	19%	0.9%
1993-1994	17	8	2,236	262	371,271	794	66	13.3	3,848	14	96	12%	0.2%
1994-1995	29	22	1,953	1,152	278,667	1,509	70	15.5	1,894	21	147	59%	0.5%
1995-1996	55	31	1,964	1,119	285,553	2,069	69	15.2	4,152	53	69	57%	0.7%
1996-1997	26	18	1,617	956	262,830	1,215	67	13.6	3,189	26	82	59%	0.5%
1997-1998	38	31	1,701	1,100	277,050	200	67	13.5	5,384	36	51	65%	0.1%
1998-1999	24	12	1,241	516	173,524	689	70	15.8	2,505	21	69	42%	0.4%
1999-2000	39	26	2,562	1,578	339,806	1,255	72	16.6	4,958	36	69	62%	0.4%
2000-2001	39	30	2,128	1,449	289,524	3,416	71	16.2	6,377	33	45	68%	1.2%
2001-2002	12	10	1,218	426	166,319	513	71	16.1	3,602	12	46	35%	0.3%
2002-2003	14	11	1,678	912	230,833	1,229	71	16.0	2,289	14	101	54%	0.5%
2003-2004	12	12	995	840	171,356	811	66	12.8	1,488	11	115	100%	0.5%
2004-2005	8	8	725	402	95,433	102	72	16.7	1,491	8	64	100%	0.1%
2005-2006	10	10	601	567	81,060	403	71	16.3	1,310	8	62	100%	0.5%
2006-2007	6	5	271	230	52,143	101	63	11.3	813	6	65	85%	0.2%
2007-2008	4	4	150	150	23,416	0	-	-	239	3	51	100%	0.0%

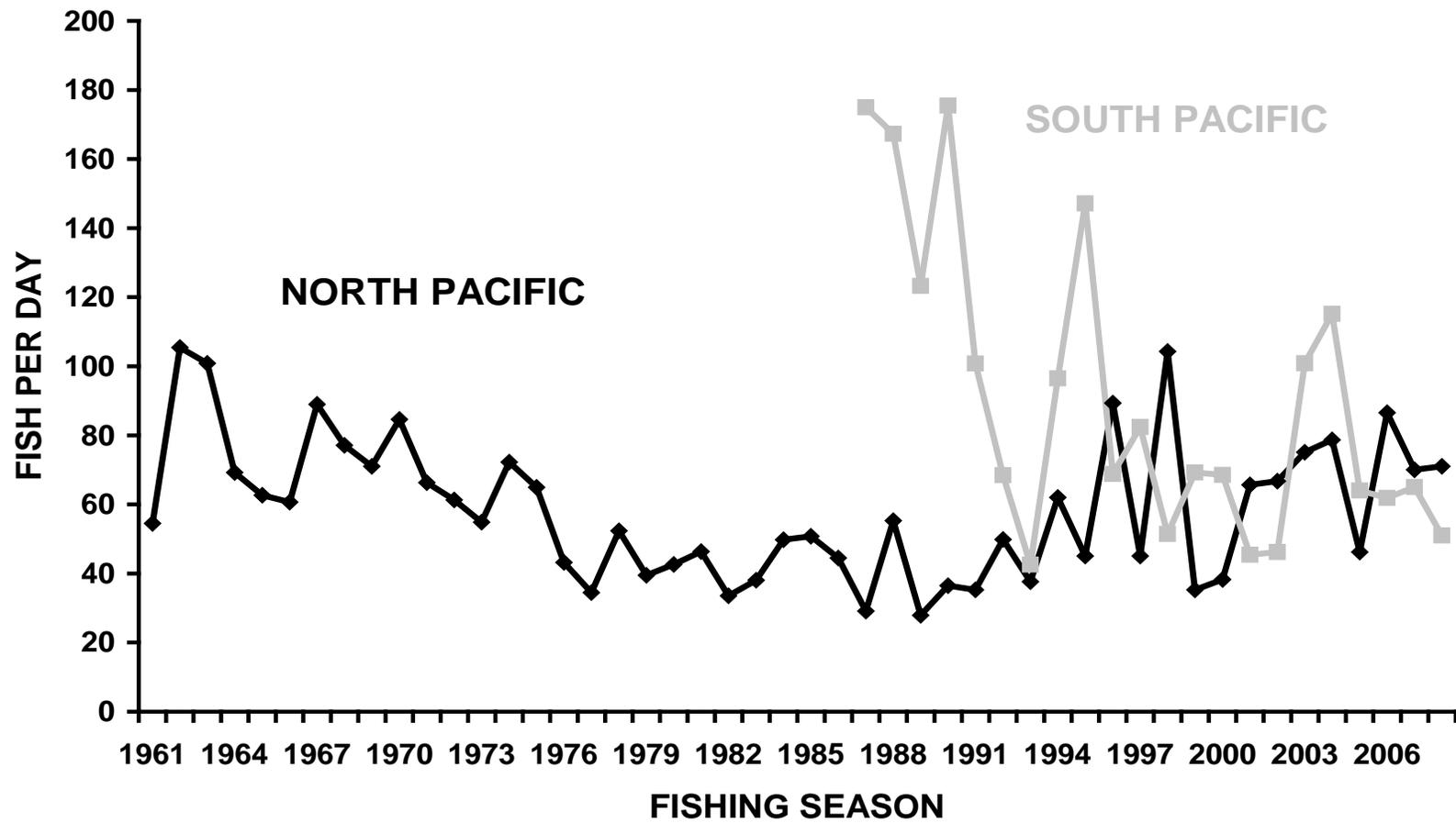
<sup>1</sup> Total catches for U.S. South Pacific albacore troll fishery may include catch from November and December of the previous year. Total catches for seasons before 1996-97 may contain catch from non-U.S. vessels.



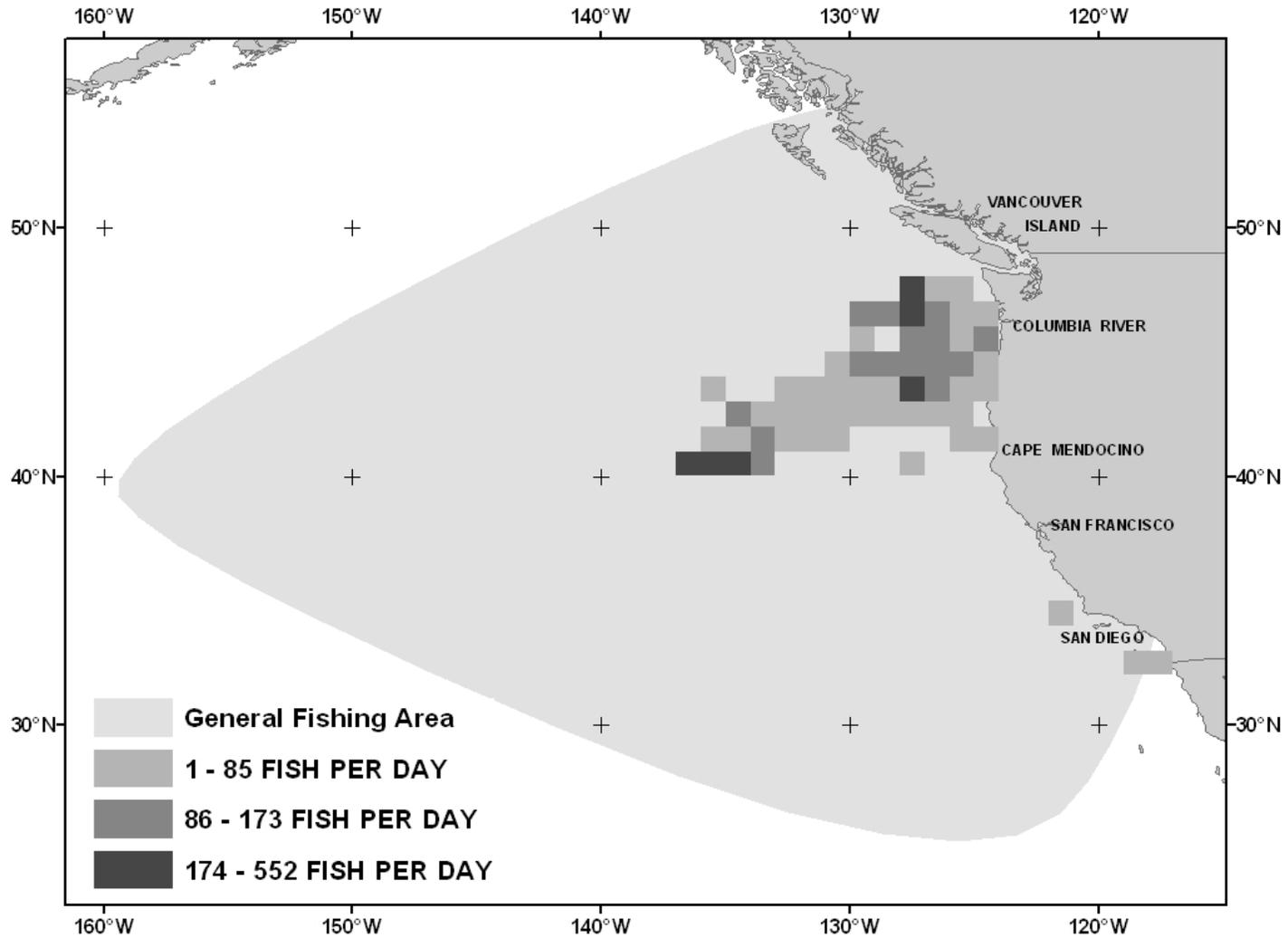
**Figure 1.** Geographic distribution of albacore catches by the 2008 U.S. North Pacific albacore troll fishery.



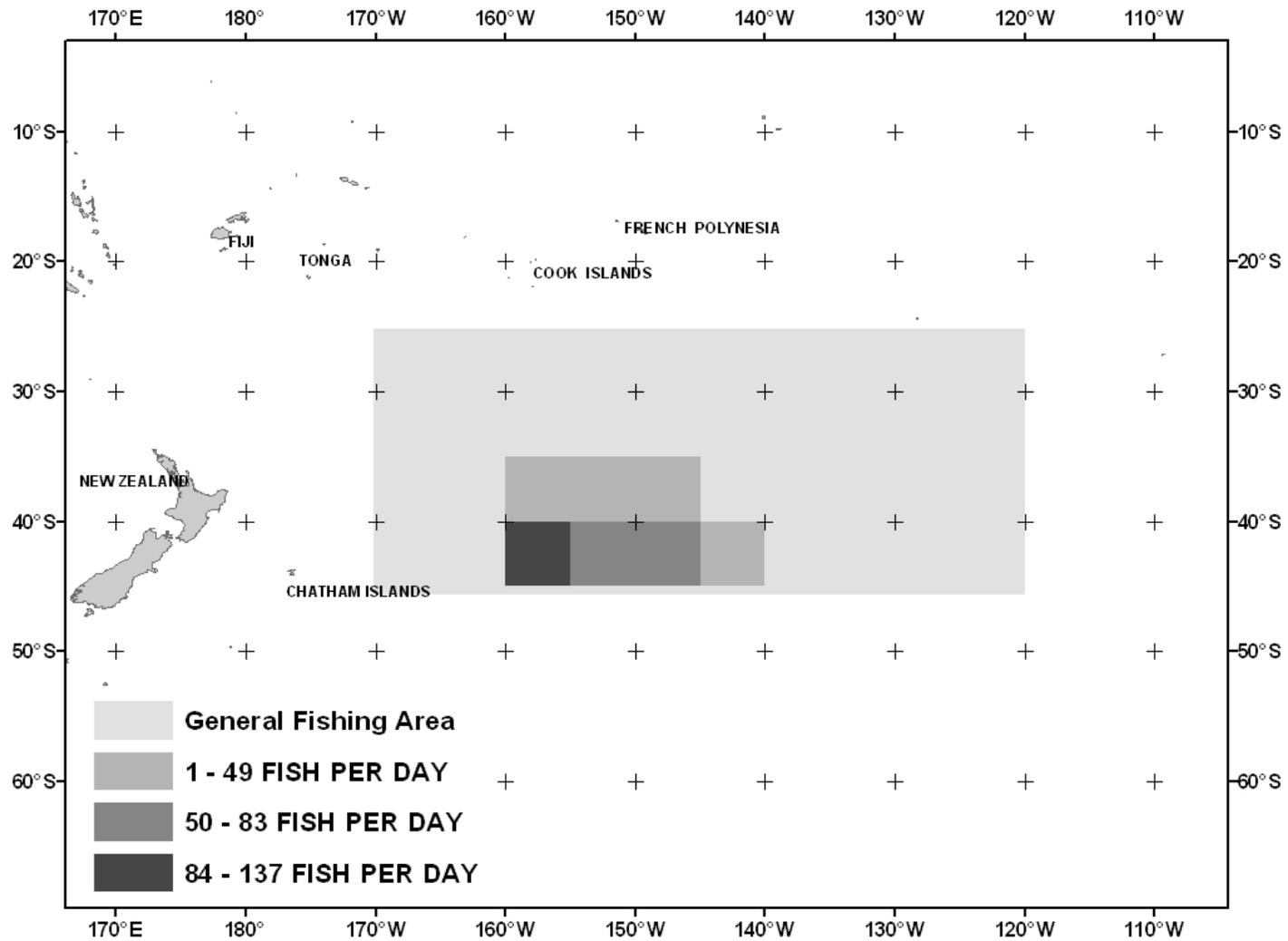
**Figure 2.** Geographic distribution of albacore catches by the 2007-2008 U.S. South Pacific albacore troll fishery.



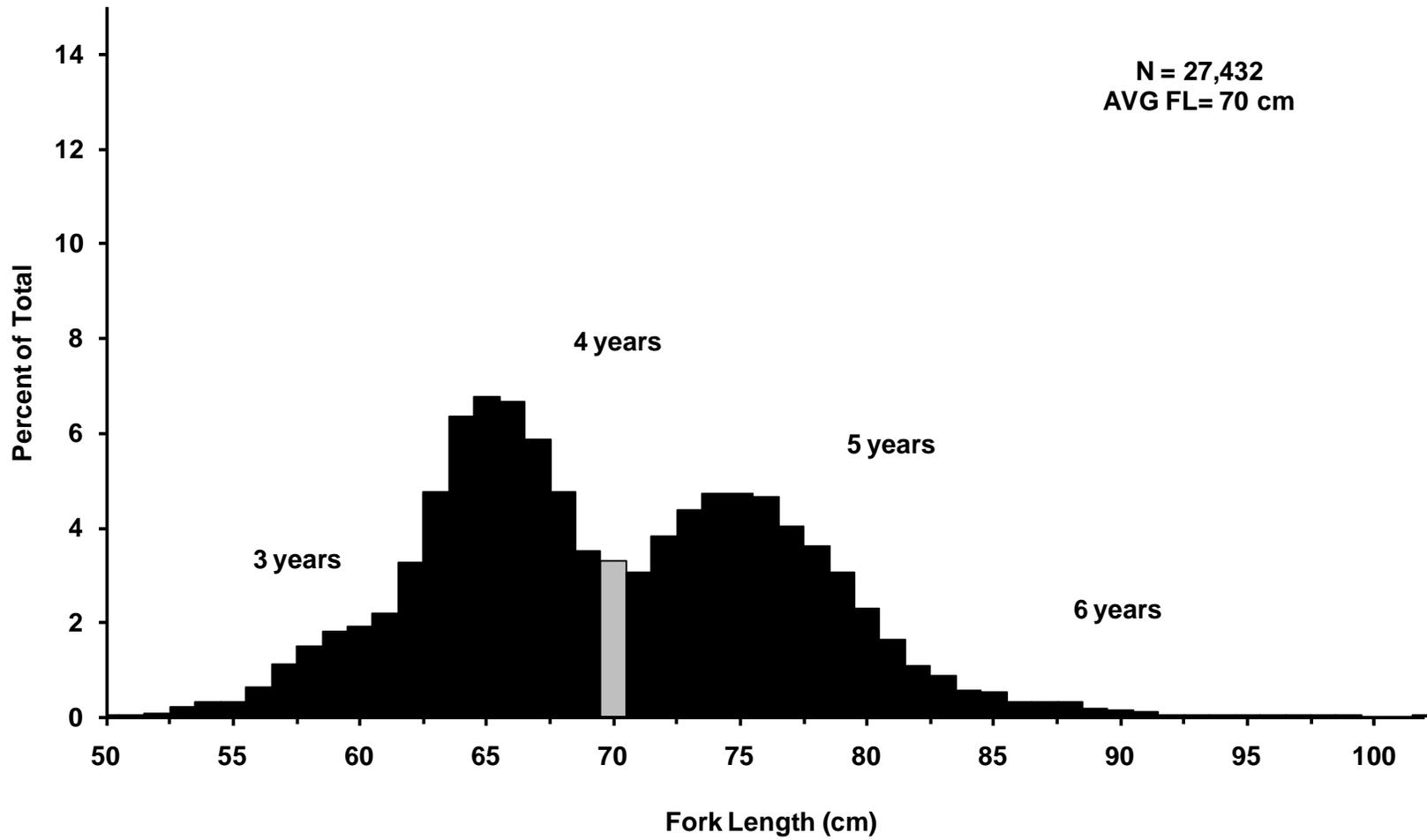
**Figure 3.** CPUEs from the U.S. North and South Pacific albacore troll fisheries from 1961 through 2008.



**Figure 4.** Geographic distribution of albacore CPUEs by 2008 U.S. North Pacific albacore troll fishery.



**Figure 5.** Geographic distribution of albacore CPUEs by U.S. troll vessels by the 2007-2008 U.S. South Pacific albacore troll fishery.



**Figure 6.** Length-frequency histogram of North Pacific albacore caught by U.S. troll vessels during the 2008 season.