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of the central-western Pacific
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INTRODUCTION

U.S. distant-water, small-scale commercial and artisanal fisheries operate in the central-western Pacific and use purse seine, longline, pole-and-line, troll or handline fishing gears to catch tropical tunas, billfish and South Pacific albacore. The small-scale or artisanal fisheries operate entirely within U.S. Exclusive Economic Zones (EEZs) or close to home ports, while the distant-water fisheries operate on the high seas or within the EEZs of other countries. Catches include skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*), bigeye tuna (*T. obesus*), albacore (*T. alalunga*), blue marlin (*Makaira mazara*), and striped marlin (*Tetrapturus audax*). Skipjack tuna accounts for approximately 71% of the U.S. central-western Pacific total catch, yellowfin tuna, 21%, bigeye tuna, 4% and the other species, approximately 4%.

This report presents a time series of annual catches for U.S. central-western Pacific fisheries during the period 1993 to 1997. While other species are caught by these fisheries, the scope of this report has been limited to catches of yellowfin, skipjack and bigeye tunas, blue and striped marlin and South Pacific albacore. Special emphasis is given to comparisons of the 1996 and 1997 fishing seasons including a summary on the disposition of catches, 1997 size distributions of the major species, 1997 bycatch estimates and finally an outlook for the fisheries in 1998. Catch data presented for 1997 are preliminary.

FISHERIES

Purse Seine Fishery

The U.S. distant-water purse seine fishery operates between 10°N and 10°S latitude and 150°W and 130°E longitude (Figure 1). The fishery has been managed through a Regional Tuna Treaty since 1988. Catches continued a decline, that started in 1995, from 149,423 t in 1996 to 144,424 t in 1997 (Table 1). Leading this trend were skipjack tuna catches that decreased over 40% since 1994. Changes in the fleet size parallels the catch trend and decreased from 40 vessels in 1996 to 35 in 1997. In the past (1993-1996) skipjack tuna comprised between 70-80% of the catches; however, in 1997 skipjack tuna accounted for only 59% of the catch. The decreased proportion of skipjack in the catch may be partially explained by changes in current fishing practices of the fleet; in that, there was a switch from fishing predominately on free-swimming schools before 1997 to

fishing primarily on schools associated with drifting objects (especially fish aggregating devices, FADs) in 1997.

As in the past, the majority (90%) of the 1997, U.S. purse seine catch was landed at or transshipped to canneries in American Samoa. The rest of the catch was landed in Guam, Federated States of Micronesia (FSM), Kiribati, Papua New Guinea, Australia and Solomon Islands. Approximately 82% of the 1997 catch was processed in American Samoa. The remainder was exported to other canneries in the Pacific region or Europe.

Tropical tunas in U.S. purse seine catches were measured for fork length (FL) as vessels unloaded in American Samoa. From 1993 to 1997, the average sizes of yellowfin, skipjack and bigeye tuna did not change significantly. The mean size of skipjack tuna, in 1997, was 53 cm FL, while yellowfin tuna and bigeye tuna averaged 76 and 61 cm FL respectively (Figure 2). In 1996, mean sizes were less; 51 cm FL for skipjack tuna, 64 cm FL for yellowfin tuna, and 58 cm FL for bigeye tuna. Larger fish, in 1997, continued to be caught in free-swimming schools; while smaller fish were most often caught in schools associated with drifting objects.

Longline Fisheries

There are three U.S. longline fisheries operating in the central-western Pacific. One operates in the North Pacific and is based in Hawaii (Figure 3) and the other two are small-scale fisheries fishing within their respective EEZs of American Samoa and the Marshall Islands/FSM.

The Hawaii-based fishery accounts for approximately 90% of the U.S. central-western Pacific longline catch of tropical tunas, billfish and South Pacific albacore (Table 2). It is the larger of the U.S. longline fisheries and targets swordfish and bigeye tuna. Catches of tropical tunas and billfish (excluding swordfish, *Xiphias gladius*) increased from 3,347 t in 1996 to 4,522 t in 1997. The most significant increases were for skipjack, yellowfin and bigeye tuna with 154%, 81% and 36%, respectively. The number of vessels participating in the fishery increased slightly from 103 in 1996 to 105 in 1997. The most significant change in the fishing operations since 1995 has been a shift from mainly targeting swordfish to targeting tunas.

The Hawaii-based longline fishery lands most of its catch in Hawaii and the fish are sold at local fish auctions. Size sampling of the catch is conducted in Hawaii at the fish auctions where fish are measured for round weight in pounds. In 1997, the average size of yellowfin tuna caught was 40 kg, bigeye tuna 32 kg, striped marlin 30 kg and blue marlin 60 kg (Figure 4).

The small-scale longline fisheries in American Samoa and the Marshall Islands/FSM are relatively new, starting in 1995 and 1993 respectively. The American Samoa fishery targets mainly South Pacific albacore and has experienced rapid growth in recent years (Table 2). In 1997, there were 22 vessels actively fishing, up from 13 in 1996, and consequently, albacore catches also increased from 106 t in 1996 to 285 t in 1997, a 170% rise. Lesser quantities of skipjack, yellowfin and bigeye tunas and blue marlin were also caught. As in the past, the 1997 fishery landed directly

to local canneries or markets. Skipjack, yellowfin and bigeye tunas and albacore, in the 1997 catch, were measured at the canneries and averaged 60, 96, 114 and 99 cm FL, respectively (Figure 5).

The small-scale longline fishery based in the Marshall Islands and the Federated States of Micronesia targets mainly yellowfin tuna. Twelve vessels fished in 1996, and four in 1997 (Table 2). In 1996, 346 t of yellowfin tuna, bigeye tuna and South Pacific albacore were landed and in 1997 only 102 t. The U.S. fleet in the Marshall Islands/FSM lands at local ports or in ports in Guam, Palau and Fiji.

Troll Fisheries

U.S. troll fisheries operate in various areas of the central-western Pacific. They consist of a distant-water fishery, and 4 small-scale commercial or artisanal fisheries.

The distant-water troll fishery is made up of vessels mainly based in Oregon, Washington and California, fishes between 30°S and 45°S latitude and 180° and 115°W longitude (Figure 6) and targets South Pacific albacore. Catches peaked in the 1995-96 fishing season (December-March) at 2,186 t and decreased to 1,402 t in the 1996-97 season (Table 3). The number of vessels fishing peaked at 50 in the 1995-96 fishing season and decreased to 28 in the 1996-97 season. The 1996-97 distant-water troll fishery delivered primarily to canneries in American Samoa. However, some landings were also made in Fiji and French Polynesia. The fishery was sampled for sizes of fish in the catch as the vessels unloaded in American Samoa. The average size of fish landed in the 1996-97 season was 67 cm (Figure 7).

Small-scale and artisanal troll fisheries are conducted in 4 areas; Hawaii (combined with handline in this report), American Samoa, Guam and the Northern Marianas. The fleets operate within the respective EEZs and the total fleet size is unavailable. The Hawaii-based troll and handline fishery contributes the major portion of the catch, approximately 85%. Guam is second with 8% and the Northern Marianas and American Samoa with 4% and 3% respectively. Catches in 1997 were mainly yellowfin and skipjack tuna (71%) and decreased slightly from 2,199 t in 1995 to 2,113 t in 1996 (Table 4). Catches for the 1997 Hawaii-based troll/handline fishery are not yet available. Catches are predominately yellowfin tuna in the Hawaii-based fishery, whereas skipjack tuna dominates the catch in the American Samoa, Guam and Northern Marianas fisheries. Catches for all fisheries are sold mainly at local markets. Sizes of fish in 1997 landings for all except the Hawaii-based fishery are shown in Figures 8a-c. Average sizes of both yellowfin and skipjack tunas in the 1997 American Samoa fishery are larger than those in either the Guam or Northern Marianas fisheries.

Pole-and-line Fishery

The pole-and-line fishery, based in Hawaii, is currently the only U.S. pole-and-line fishery operating in the central-western Pacific Ocean. The fleet fishes exclusively in the Hawaiian EEZ. Catches are predominately skipjack tuna (99%) with small quantities of yellowfin tuna (1%). Total

catches in both 1996 and 1997 were the same at 781 t (Table 5). Catches from this fishery are landed at local fish markets and are quasi-regulated to maximize revenues while meeting the needs of these markets. Estimates of numbers of vessels in the fishery and size composition of the catches are not available.

BYCATCHES

The only currently available bycatch estimates for 1997 U.S. fisheries in the central-western Pacific are for the distant-water purse seine fishery. The National Marine Fisheries Service monitors the Hawaii-based longline fishery through an observer program and bycatch estimates are being calculated for this fishery and should be available sometime in 1998. Starting with the 1998-99 season, the U.S. distant-water troll fishery will be required to record bycatch in logbooks.

Bycatches and discards in the distant-water purse seine fishery are reported on the vessel's Regional Purse Seine Logbook. Since recording of bycatch and discards is voluntary, their reliability and completeness is questionable. In 1997, 49% of the trips reported discarding of tunas at sea and 78% reported bycatches. Approximately 500 t of tunas and 400 t of bycatch species were discarded at sea (Table 6). Skipjack tuna, usually too small for profitable delivery to canneries, was the most frequently discarded tuna species. Among the bycatch species, sharks were the most frequently caught, followed by rainbow runner, *Elagatis bipinnulata*, and mahimahi, *Coryphaena hippurus*.

OUTLOOK FOR 1998

No significant changes in areas fished, fleet sizes or catches for most of the U.S. fisheries in the central-western Pacific are expected in 1998. The U.S. distant-water purse seine fishery in 1998 should be very similar to the 1997 fishery. Logbooks received so far in 1998 indicate that the fleet is continuing to find free-swimming schools of large yellowfin tuna in areas west of 160°E longitude. However, if El Niño conditions such as those in 1997 reoccur, the fleet will likely shift to the east.

The 1997-98 fishing season for the distant-water troll fleet has ended and the preliminary estimate of the South Pacific albacore catch is 1,300 t. Most of the vessels unloaded in Fiji because the Starkist cannery in American Samoa was not accepting fish. The season was poor, so most vessels will hesitate to return when the 1998-99 season begins in November.

Table 1. Catches (metric tons) and number of vessels for the U.S. central-western Pacific purse seine fishery 1993-1997. Values for 1997 are preliminary.

YEAR	VESSELS	TROPICAL TUNAS			TOTAL
		SKIPJACK	YELLOWFIN	BIGEYE	
1993	42	148,419	46,011	3,731	198,161
1994	49	151,486	56,426	1,711	209,623
1995	44	132,518	31,845	3,190	167,553
1996	40	120,146	18,632	10,645	149,423
1997	35	84,962	49,963	9,499	144,424

Table 2. Catches (metric tons) and number of vessels for U.S. central-western Pacific longline fisheries 1993-1997. Values for 1997 are preliminary.

YEAR	VESSELS	TROPICAL TUNAS			MARLINS		S. PAC. ALBACORE	TOTAL
		SKIPJACK	YELLOWFIN	BIGEYE	BLUE	STRIPED		

HAWAII

1993	122	36	630	2,114	340	471		3,591
1994	125	54	608	1,787	363	327		3,139
1995	110	104	975	2,077	581	544		4,281
1996	103	41	630	1,792	467	417		3,347
1997	105	104	1,139	2,445	485	349		4,522

AMERICAN SAMOA

1993								0
1994								0
1995	6		1				25	26
1996	13		13	4	10		106	133
1997	22		27	3	16		285	331

MARSHALL ISLANDS/FEDERATED STATES OF MICRONESIA

1993	7		74	69				143
1994	17		122	38			72	232
1995	18		203	116			25	344
1996	12		228	128			15	371
1997	4		64	30			8	102

Table 3. Catches (metric tons) and number of vessels for the U.S. distant-water troll fishery, 1993-1997. Values for 1996-97 are preliminary.

YEAR	TROLL	
	VESSELS	ALBACORE
1992-93	47	1,028
1993-94	14	530
1994-95	21	2,072
1995-96	50	2,186
1996-97	28	1,402

Table 4. Catches (metric tons) and number of vessels for the U.S. small scale and artisanal troll fisheries that operate within the EEZs of Hawaii (handline and troll), Northern Marianas, Guam and American Samoa, 1993-1997 (NA indicates that data are not available). Values for 1997 are preliminary.

YEAR	VESSELS	TROPICAL TUNAS			MARLINS		TOTAL
		SKIPJACK	YELLOWFIN	BIGEYE	BLUE	STRIPED	

HAWAII-BASED SMALL-SCALE TROLL/HANDLINE

1993	NA	160	1,130	45	313	69	1,717
1994	NA	147	1,262	164	300	35	1,908
1995	NA	156	1,260	66	317	53	1,852
1996	NA	214	996	160	374	49	1,793
1997	NA	NA	NA	NA	NA	NA	0

AMERICAN SAMOA, GUAM, NORTHERN MARIANAS TROLL/HANDLINE

1993	NA	108	49		49		206
1994	NA	196	60		62		318
1995	NA	216	71		60		347
1996	NA	192	91		37		320
1997	1,100	170	64		46		280

Table 5: Catches (metric tons) and number of vessels for the U.S. central-western Pacific pole- and-line fishery 1993-1997 (NA indicates that data are not available). Values for 1997 are preliminary.

YEAR	VESSELS	TROPICAL TUNAS		TOTAL
		SKIPJACK	YELLOWFIN	
1993	NA	962	4	966
1994	NA	514	9	523
1995	NA	570	15	585
1996	NA	780	1	781
1997	NA	781	0	781

Table 6. By-catch and discards (t) for the 1997 U.S. distant-water tuna purse seine fishery in the central-western Pacific Ocean. Species categories are ones recorded by fishermen in logbooks.

SPECIES	WEIGHT (t)
Tunas (51% by weight)	
Skipjack	395.56
Yellowfin	60.93
Bigeye	2.04
Billfishes (2% by weight)	
Black marlin	0.39
Blue marlin	0.97
Marlin	11.62 ¹
Sailfish	0.08
Striped marlin	0.07
Swordfish	0.16 ¹
Sharks (16% by weight)	
Lemon shark	0.05
Sharks	145.28 ¹
Others (31% by weight)	
Albacore	0.06
"Baitfish" ²	40.05
Barracuda	0.11
Bat ray	0.10
Black marlin and dolphinfish	0.11
Dolphinfish	101.01
Dolphinfish and wahoo	0.08
Mackerel	17.82
Mackerel, scad and rainbow runner	5.40
Manta ray	0.23
Mixed species ³	2.29
Rainbow runner	111.33
Shark and "baitfish"	0.18
Trevaly	0.01
Triggerfish	0.03
Unknown species ³	0.82
Wahoo	0.69
Wahoo and "baitfish"	0.01

¹ Estimated weights from numbers of fish caught and reported.

² Includes scads and mackerel.

³ The exact species included in these categories are unknown.

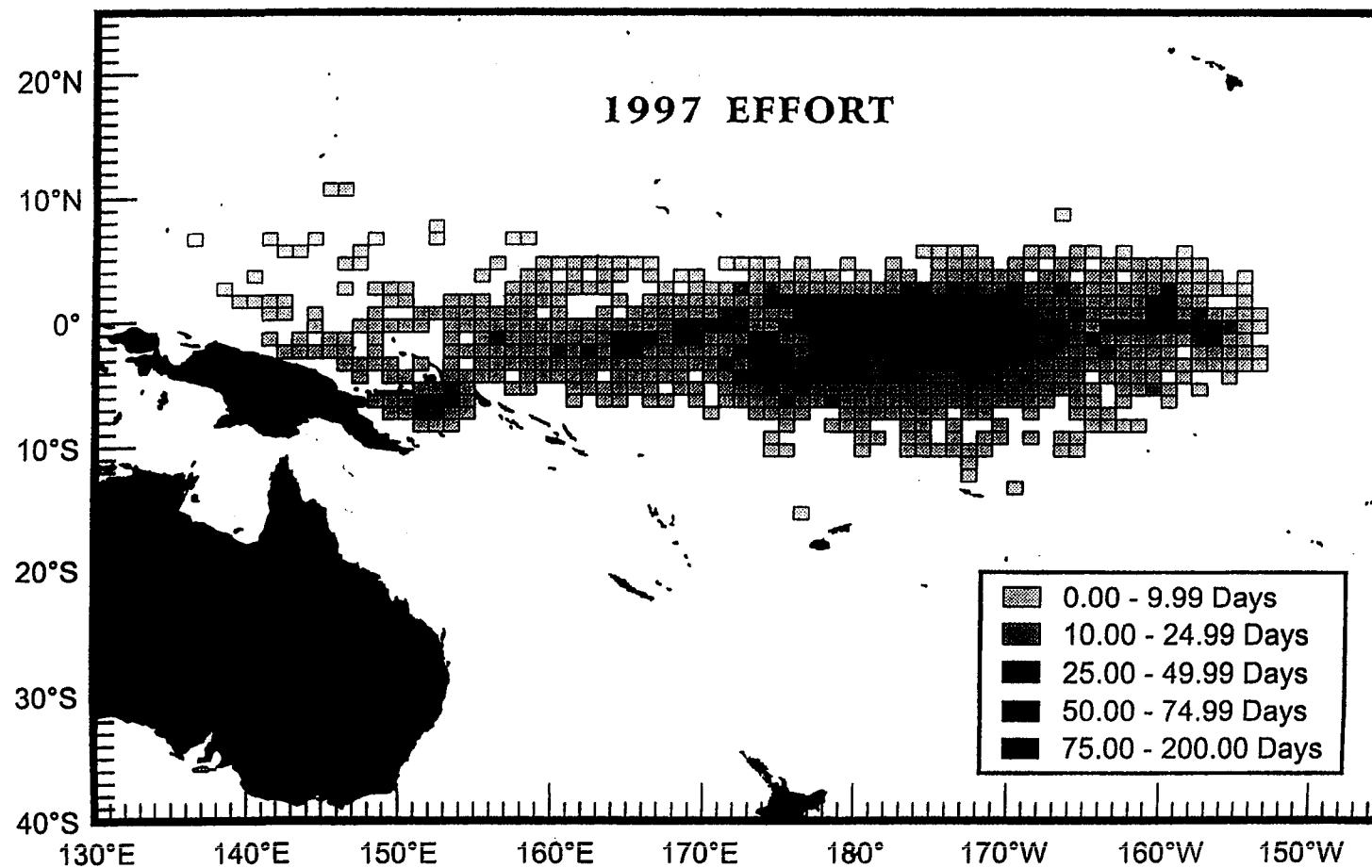


Figure 1. Location of fishing effort (days fished) for the 1997 U.S. distant-water purse seine fishery in the central-western Pacific.

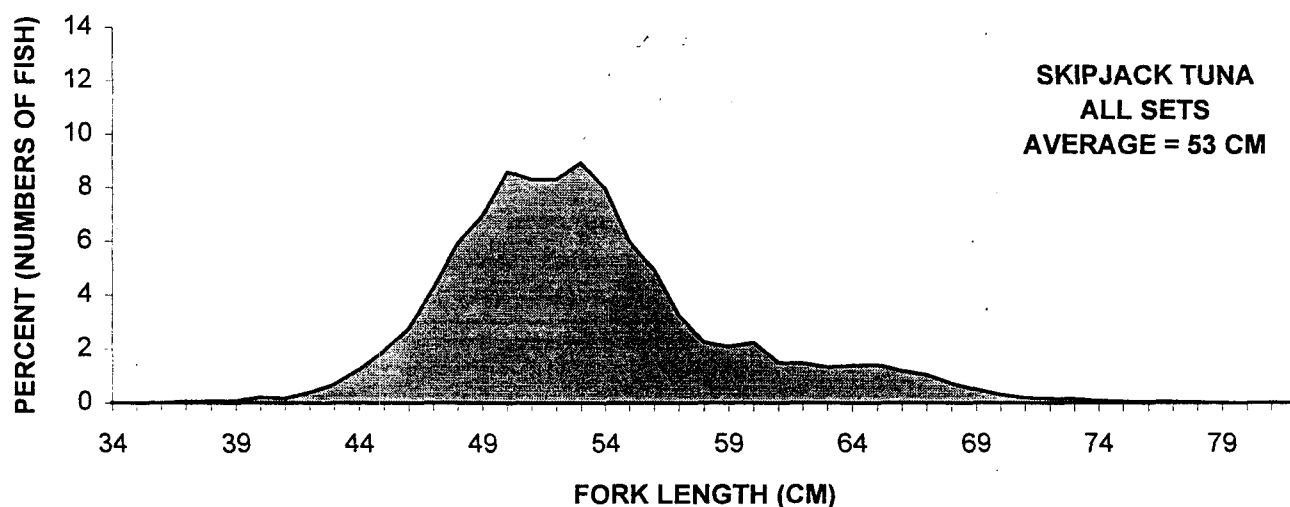
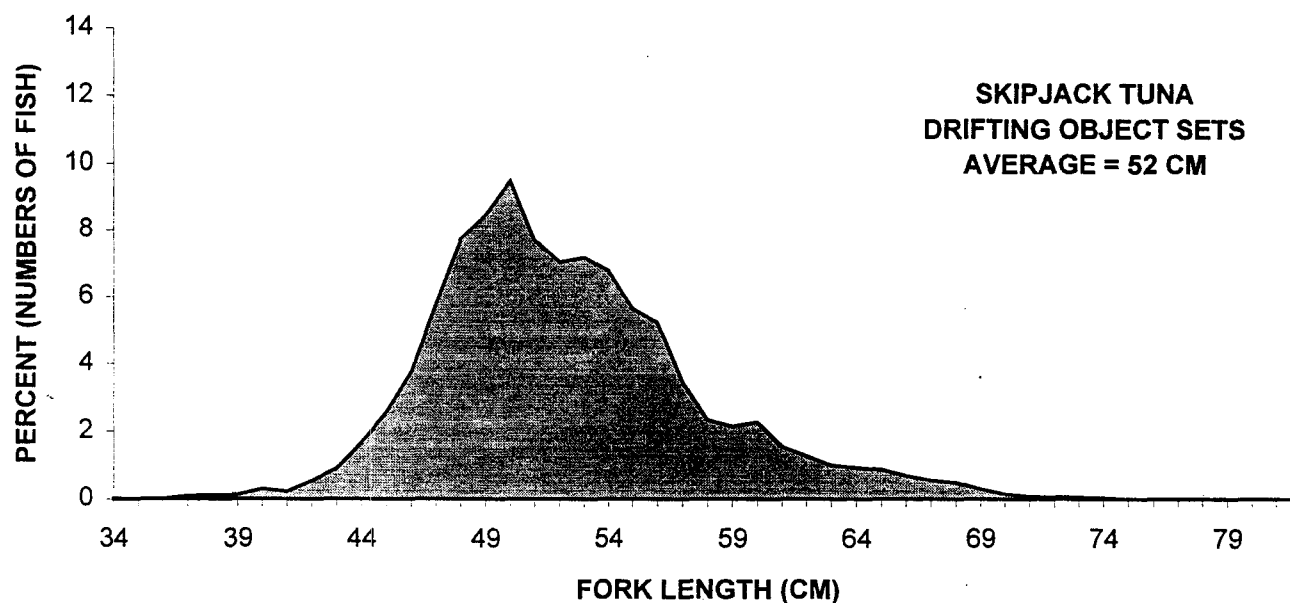
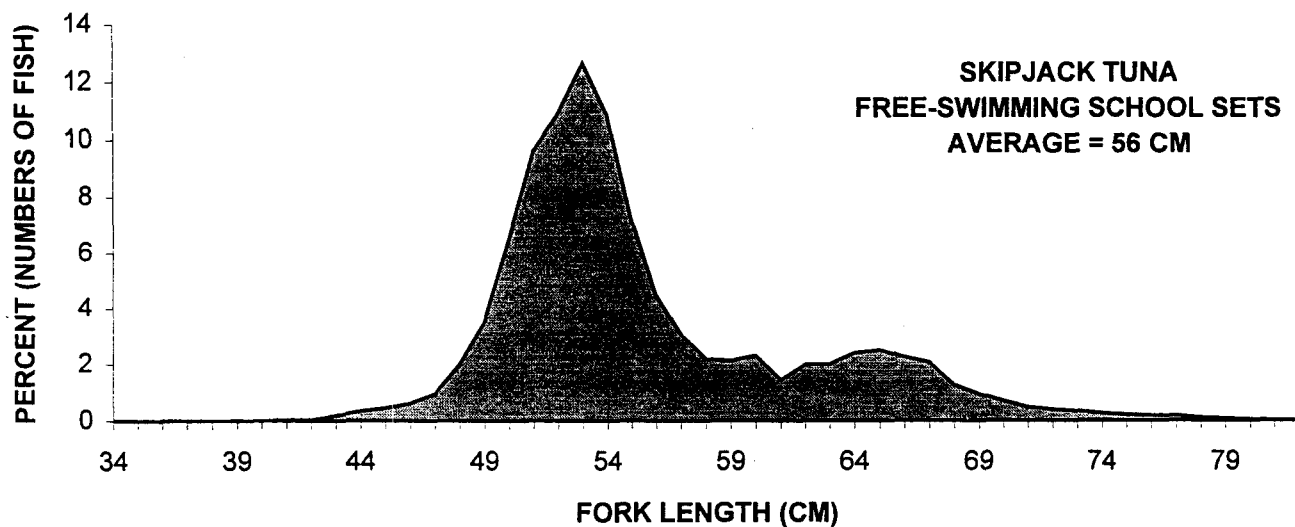


Figure 2a. Length-frequency distributions of skipjack tuna catches from the 1997 U.S. Distant-water purse seine fishery in the central-western Pacific.

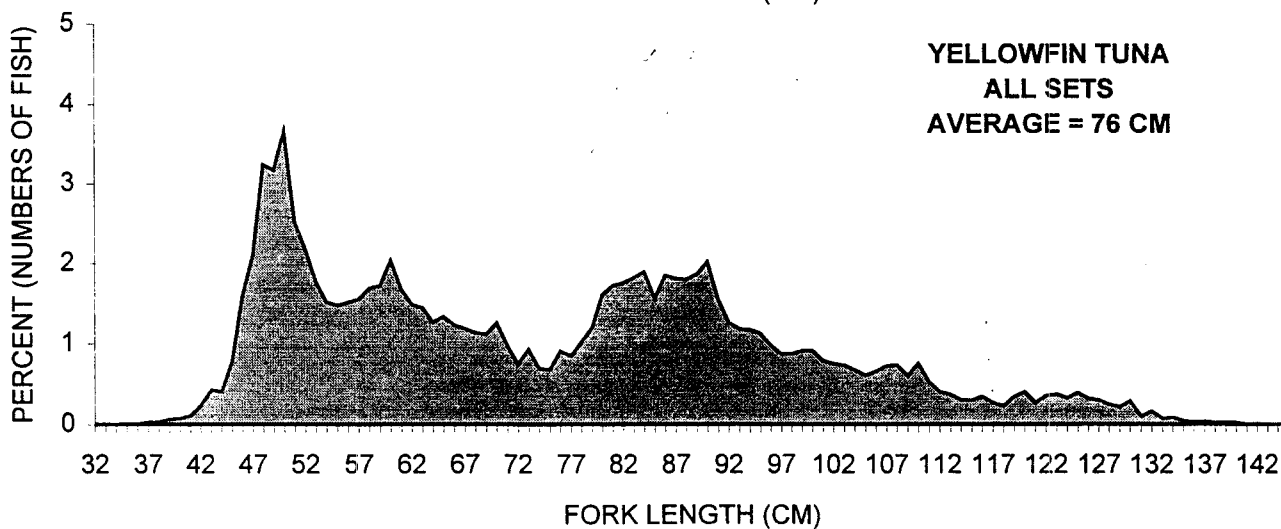
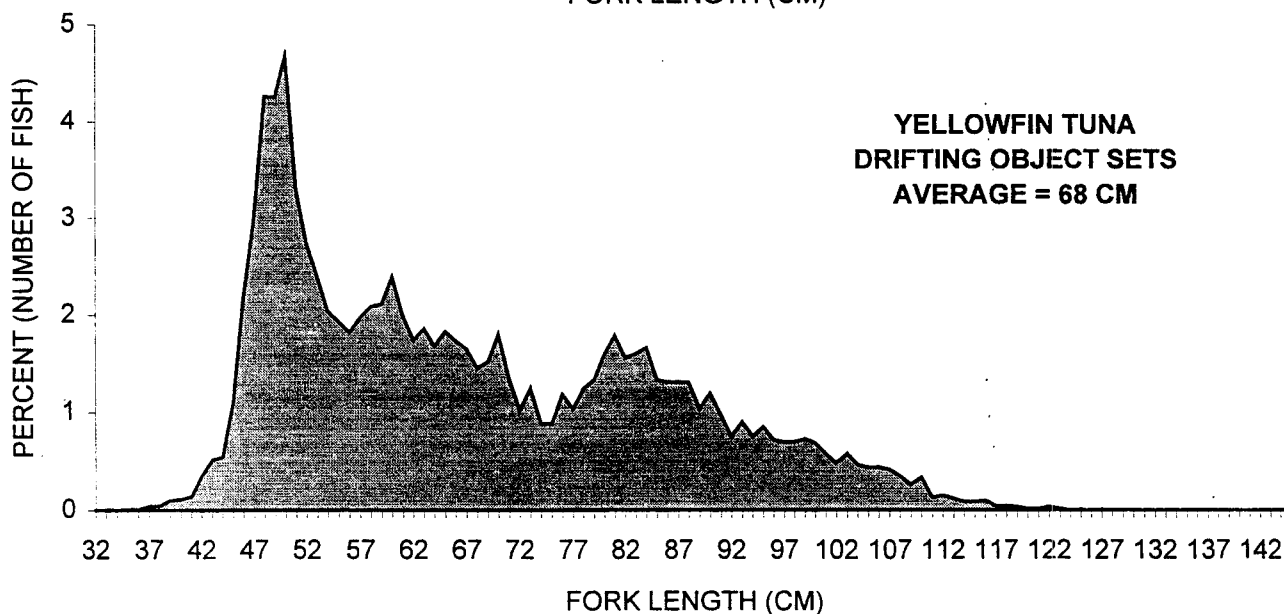
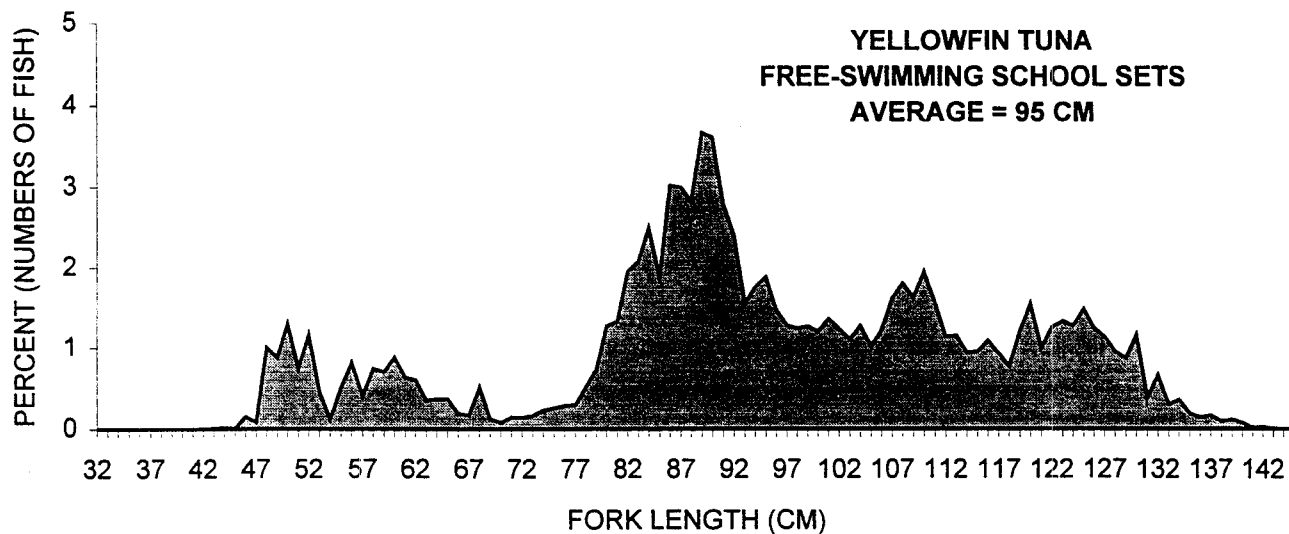


Figure 2b. Length-frequency distributions of yellowfin tuna catches from the 1997 U.S. distant-water purse seine fishery in the central-western Pacific.

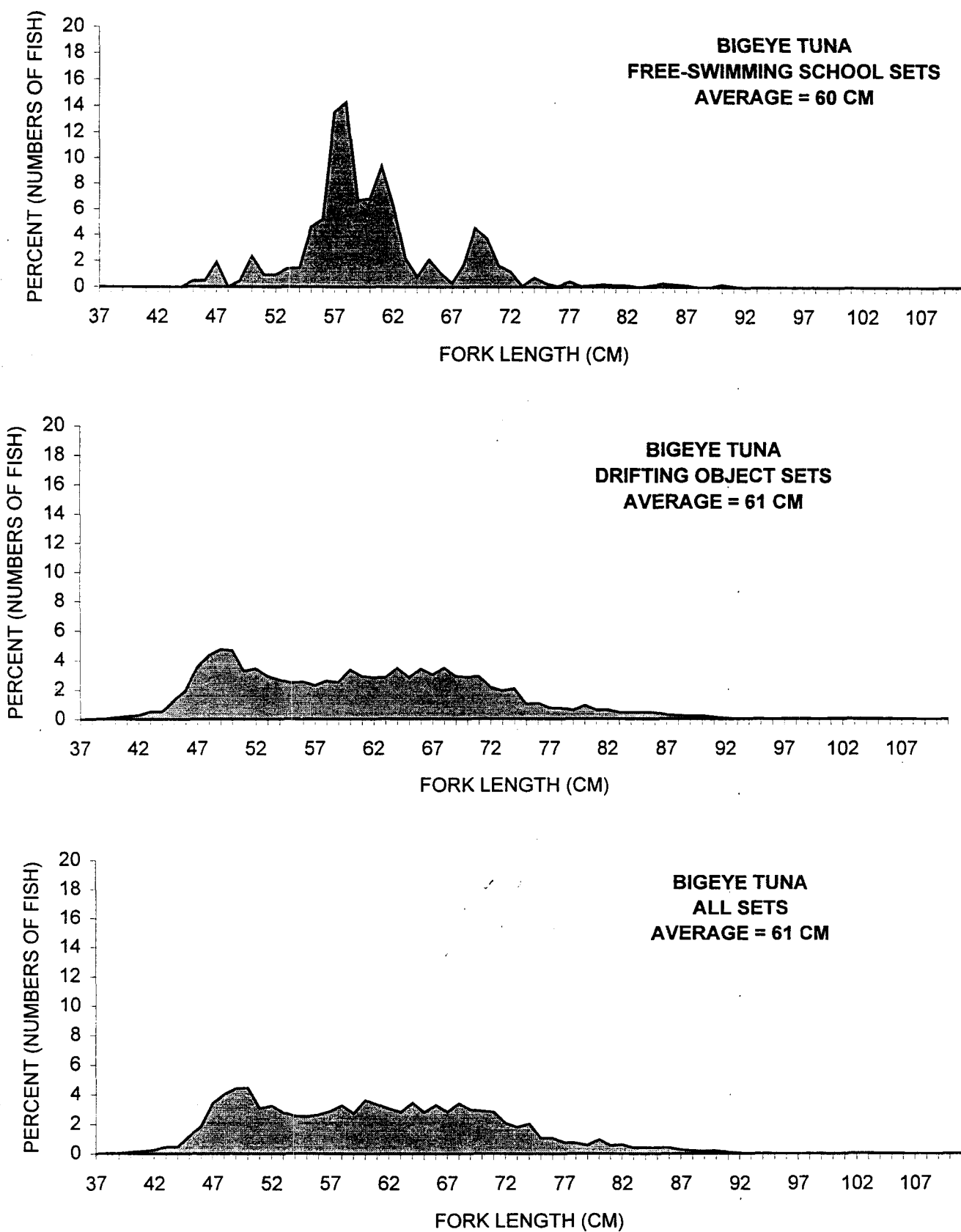


Figure 2c. Length-frequency distributions of bigeye tuna catches from the 1997 U.S. distant-water purse seine fishery in the central-western Pacific.

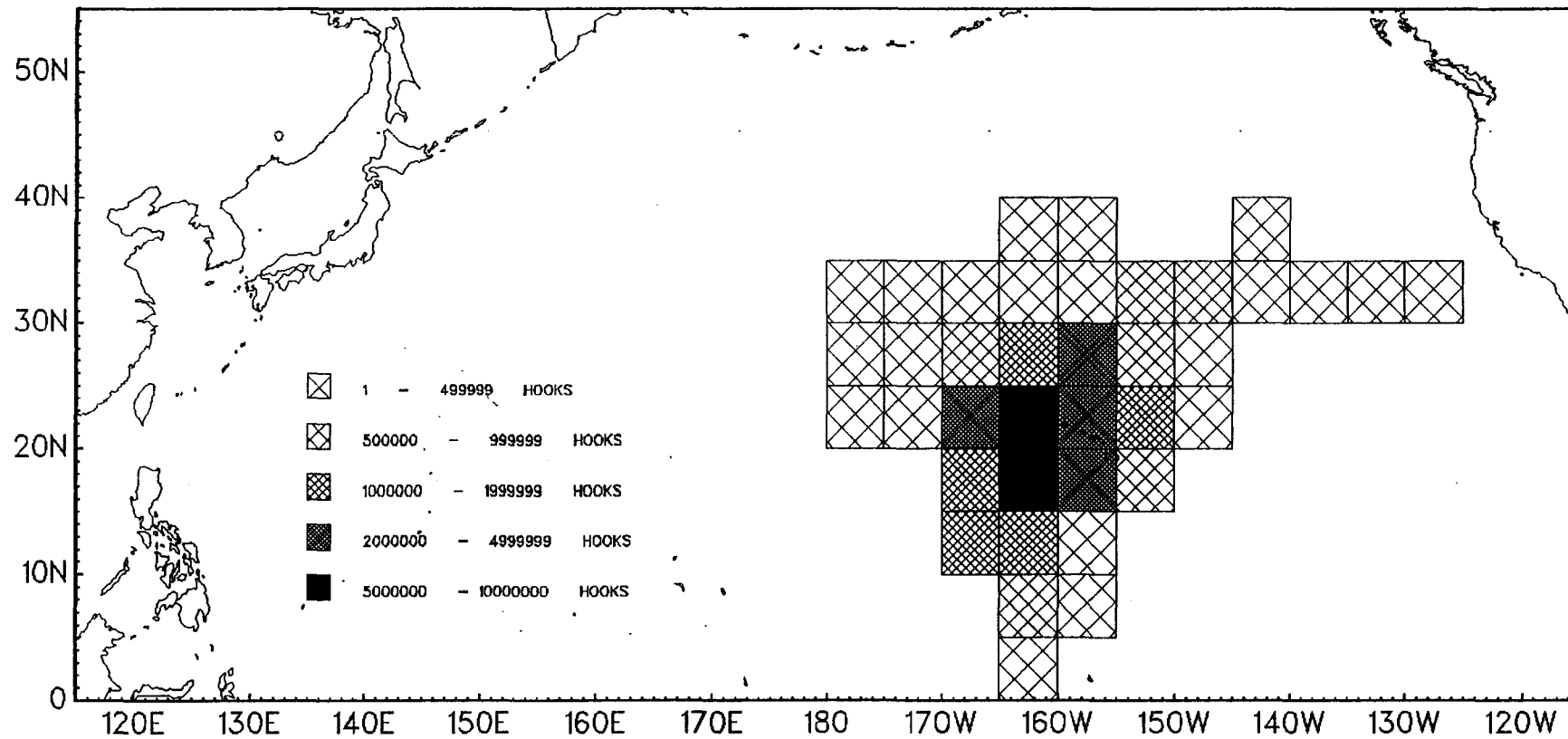


Figure 3. Location of fishing effort (number of hooks) for the 1997 Hawaii-based longline fishery.

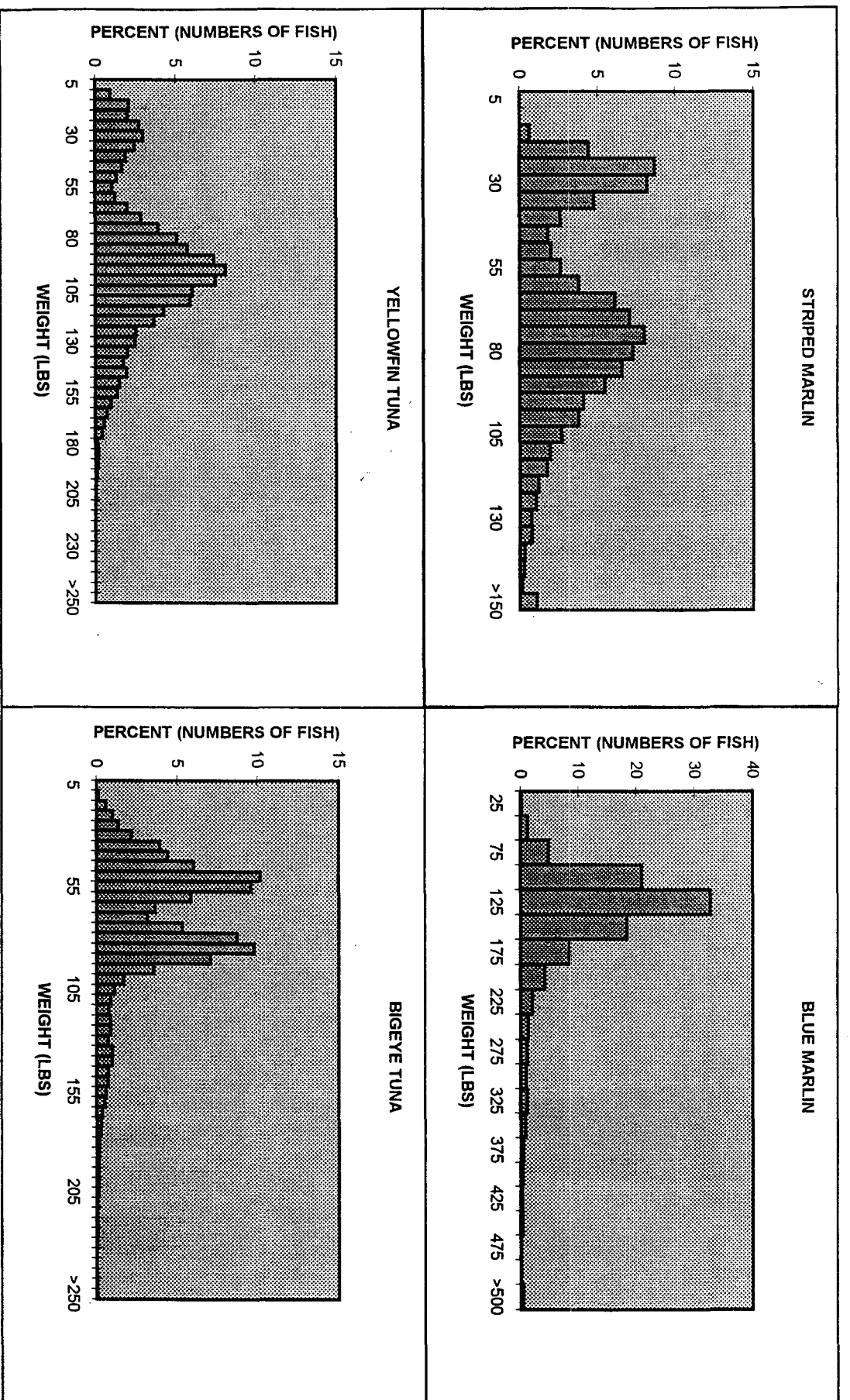


Figure 4. Weight-frequency distributions of catches from the 1997 Hawaii-based longline fishery.

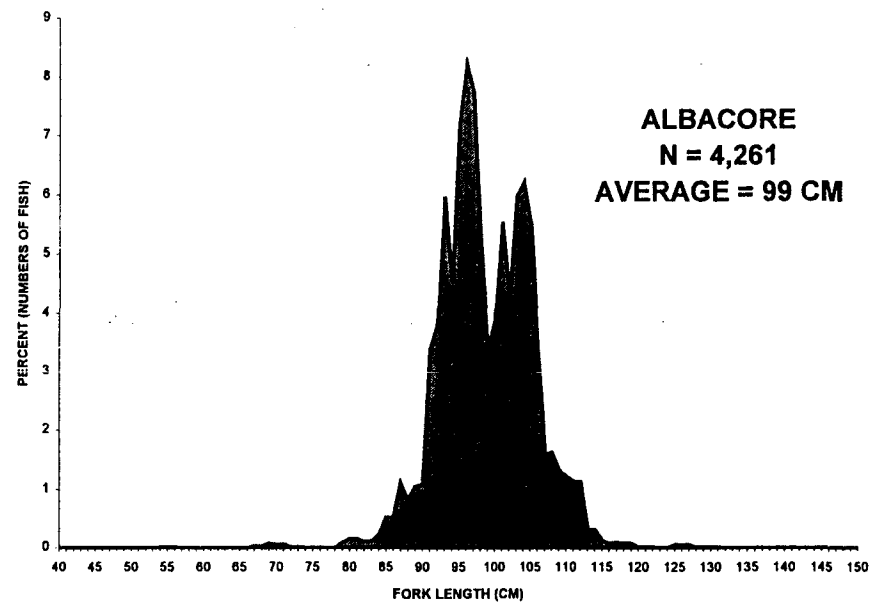
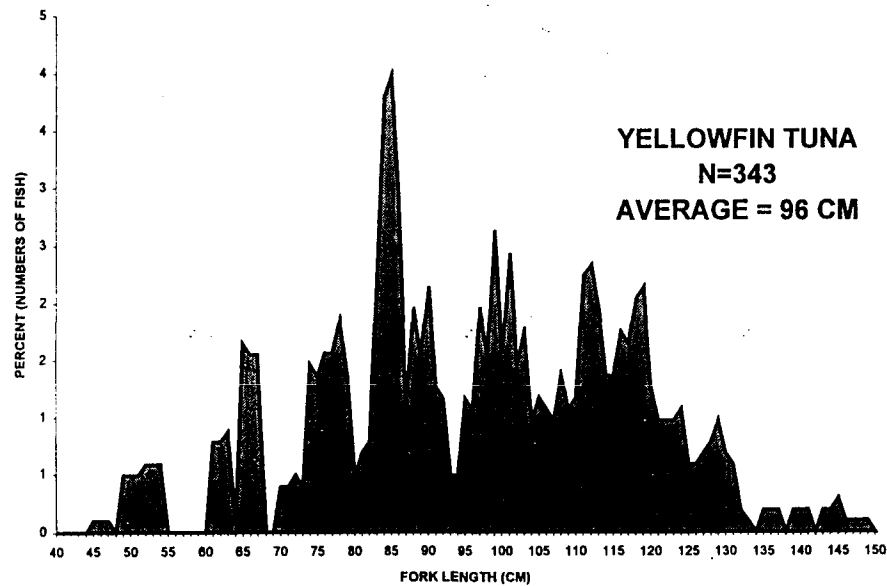
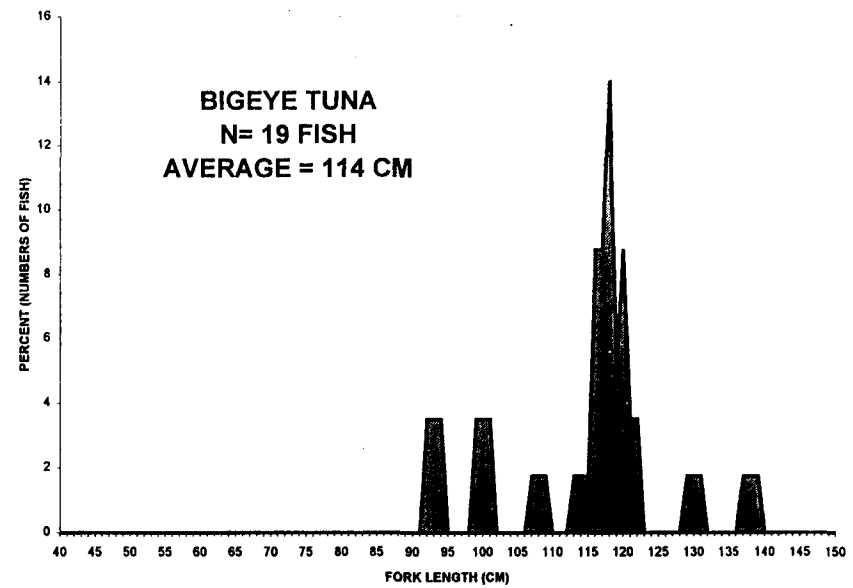
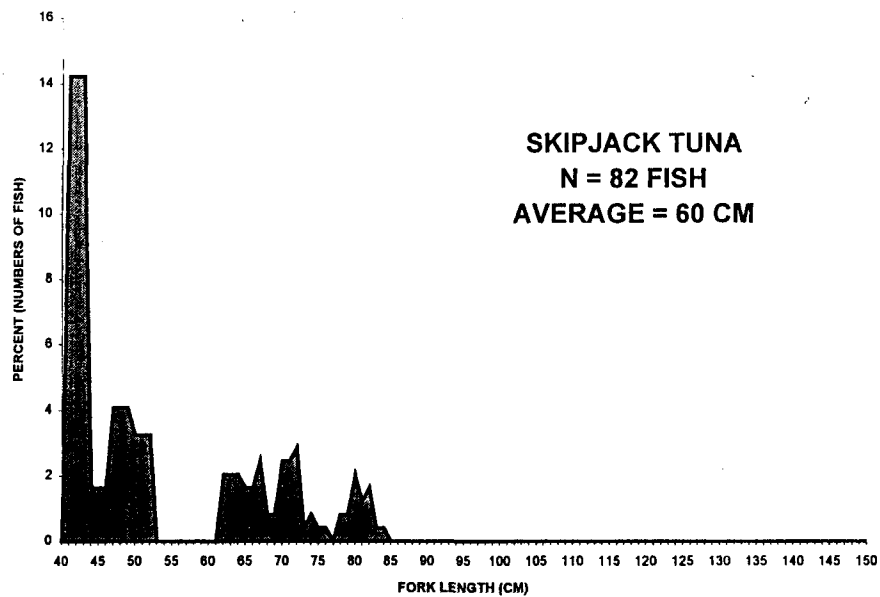


Figure 5. Length-frequency distributions of catches from the 1997 American Samoa longline fishery.

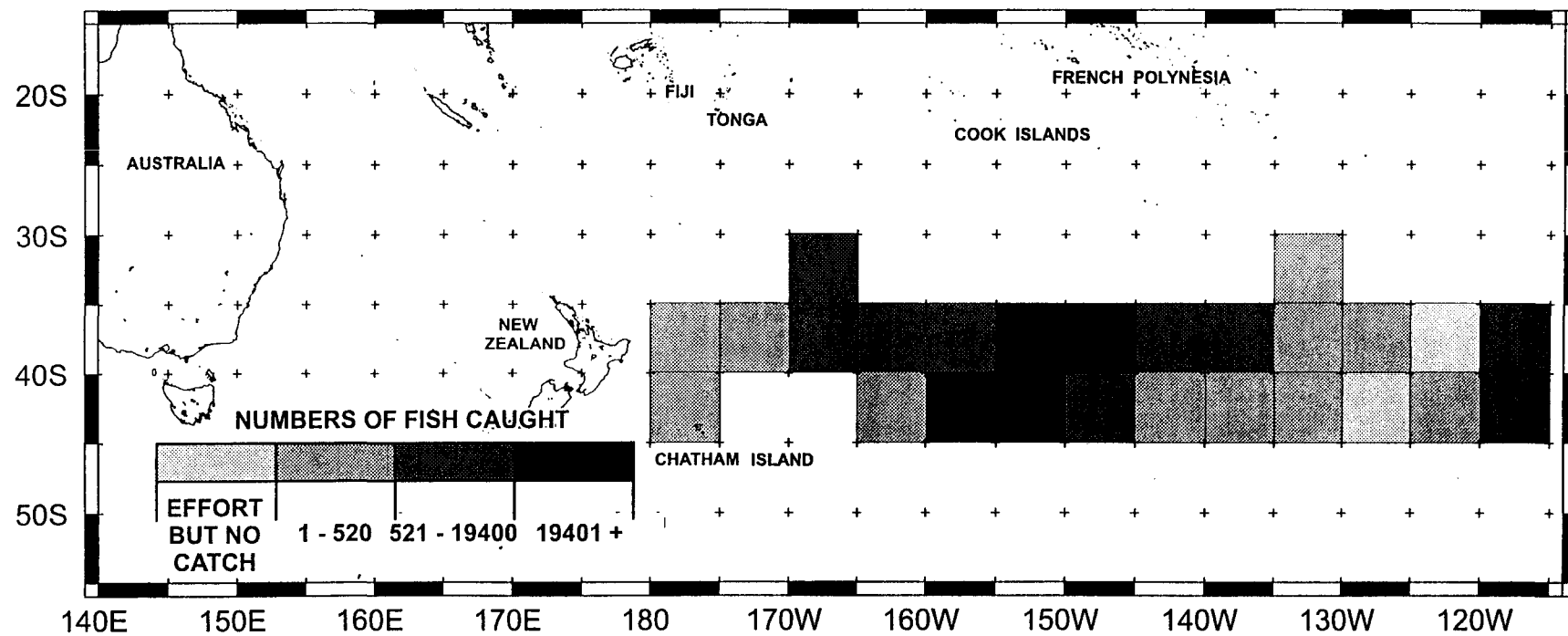


Figure 6. Location of South Pacific albacore catches from the 1996-97 U.S. distant-water troll fishery.

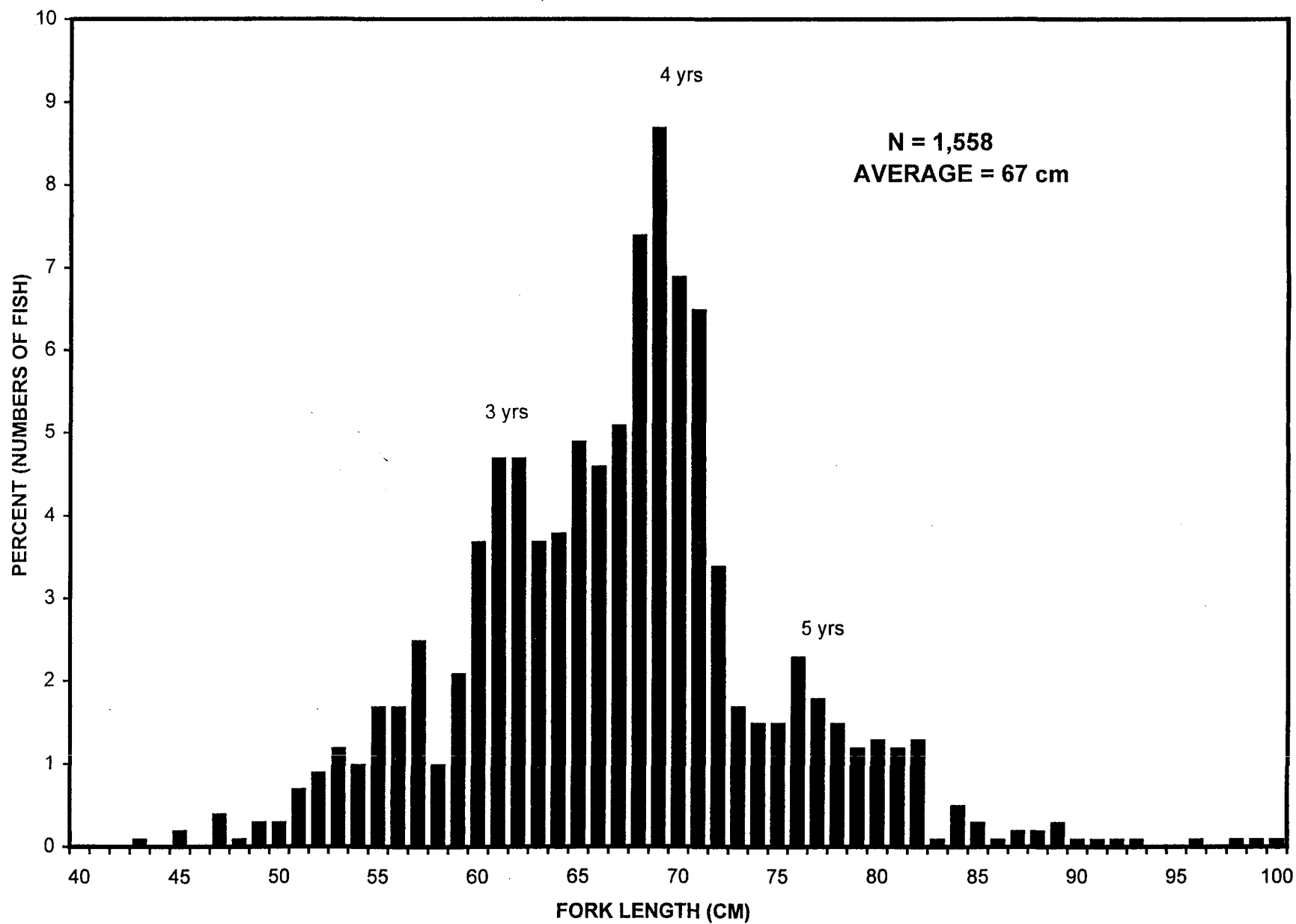


Figure 7. Length-frequency distribution of South Pacific albacore caught in the 1996-97 U.S. distant-water troll fishery.

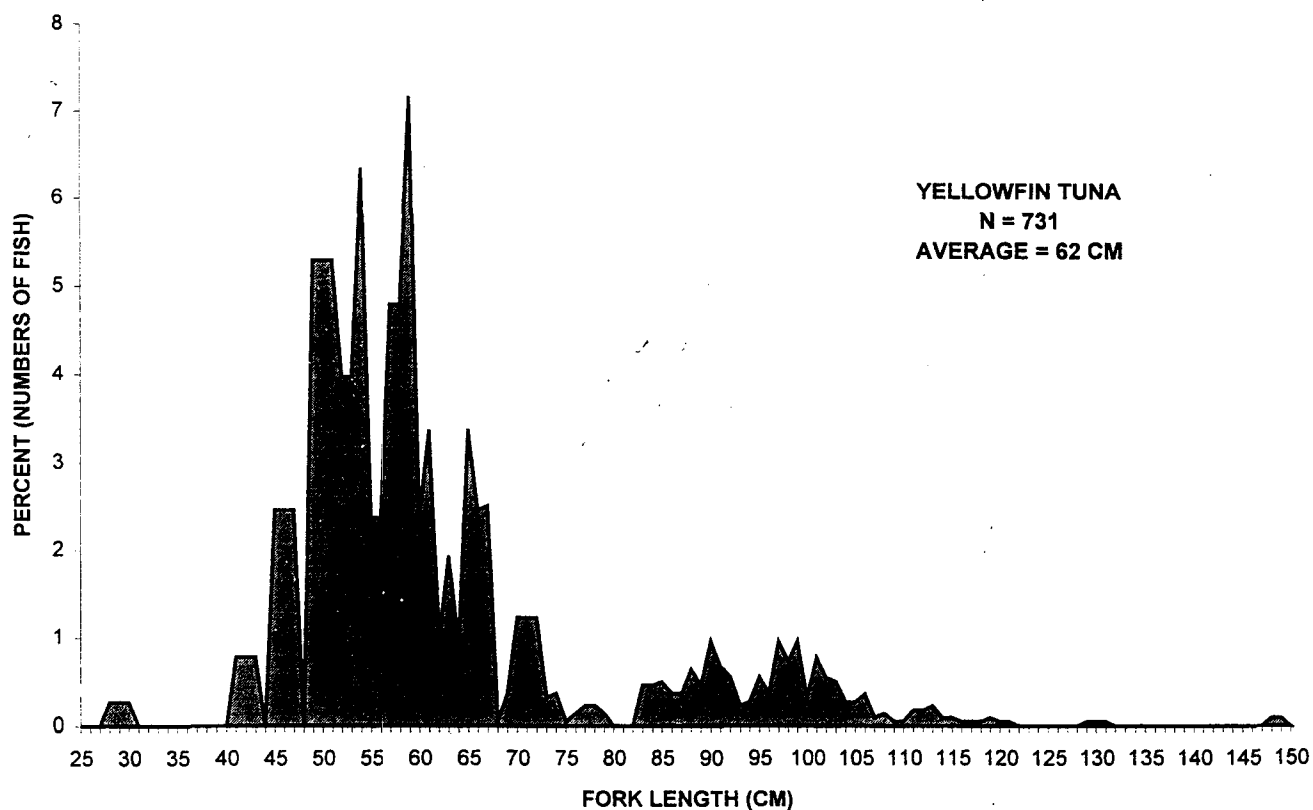
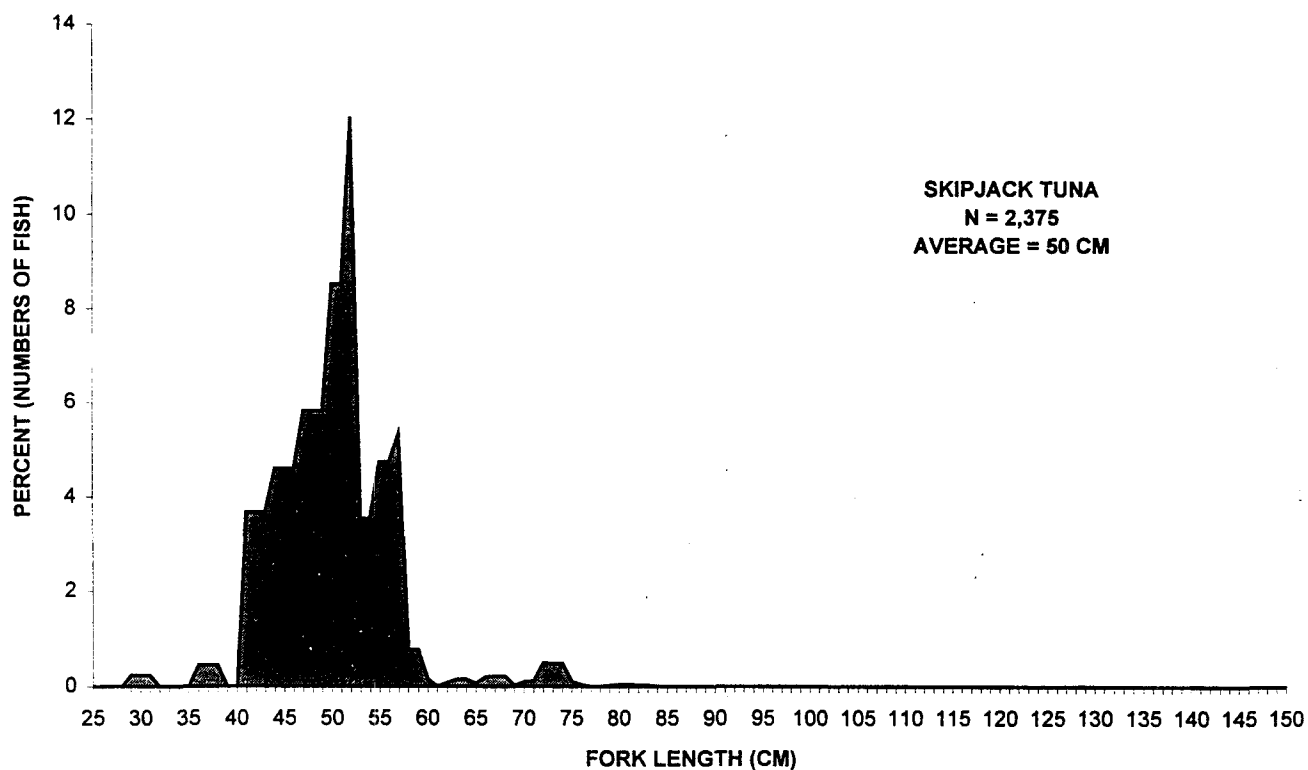


Figure 8a. length-frequency distributions of catches from the 1997 American Samoa troll/handline fishery.

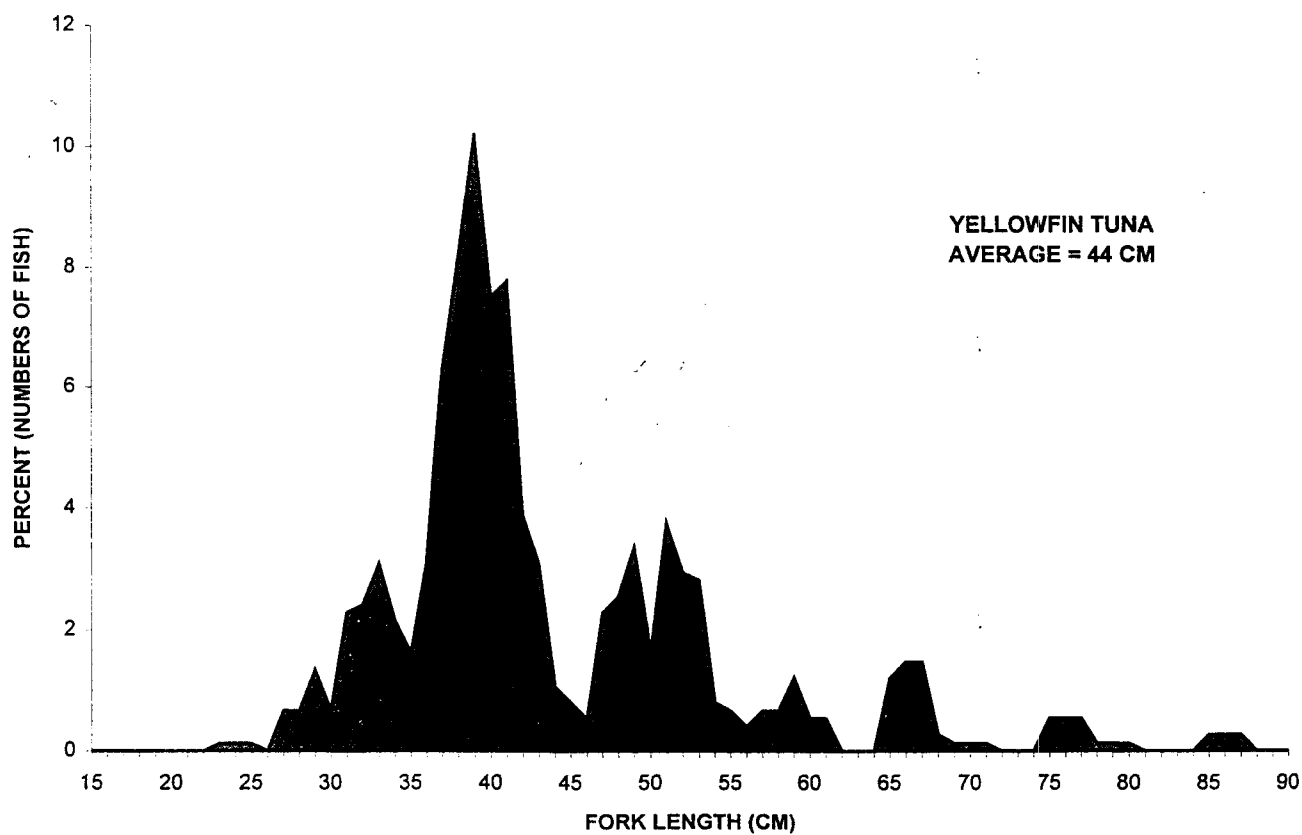
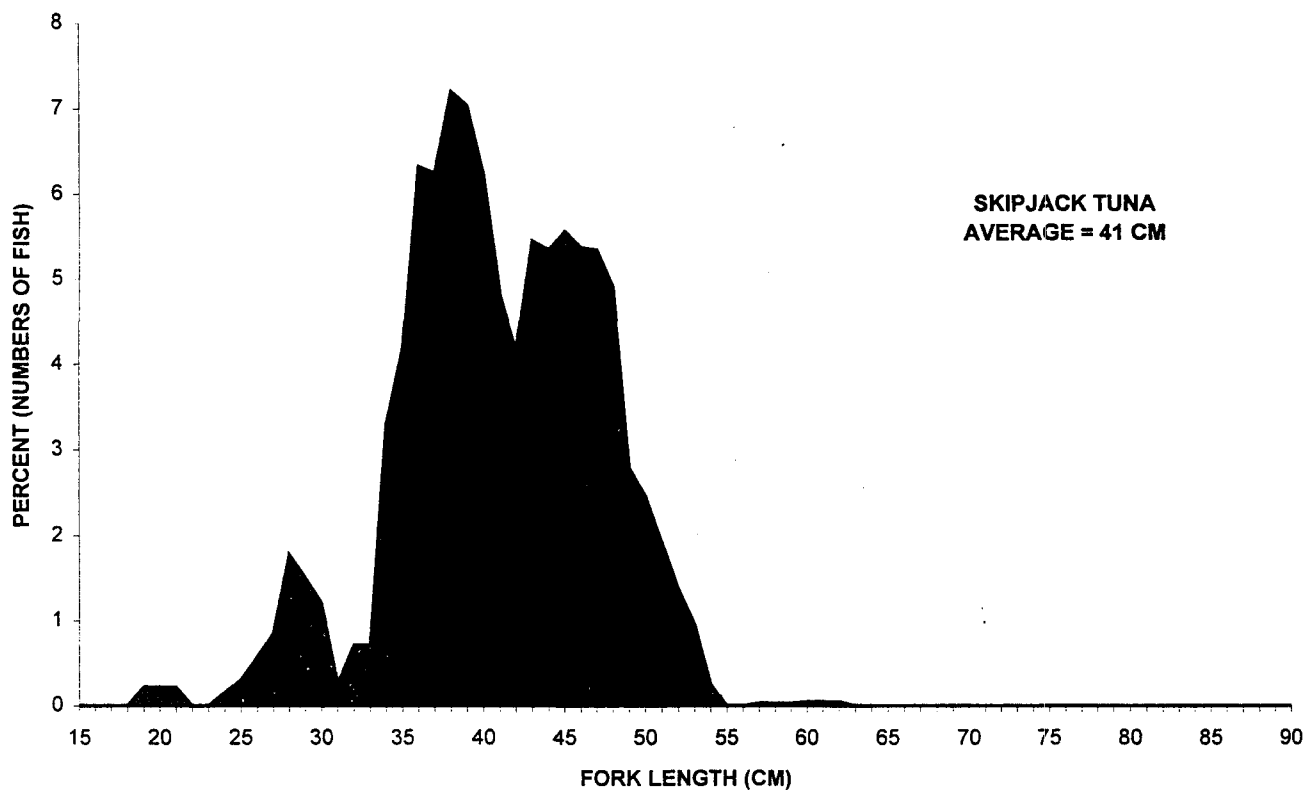


Figure 8b. Length-frequency distributions of catches from the 1997 Guam troll/handline fishery.

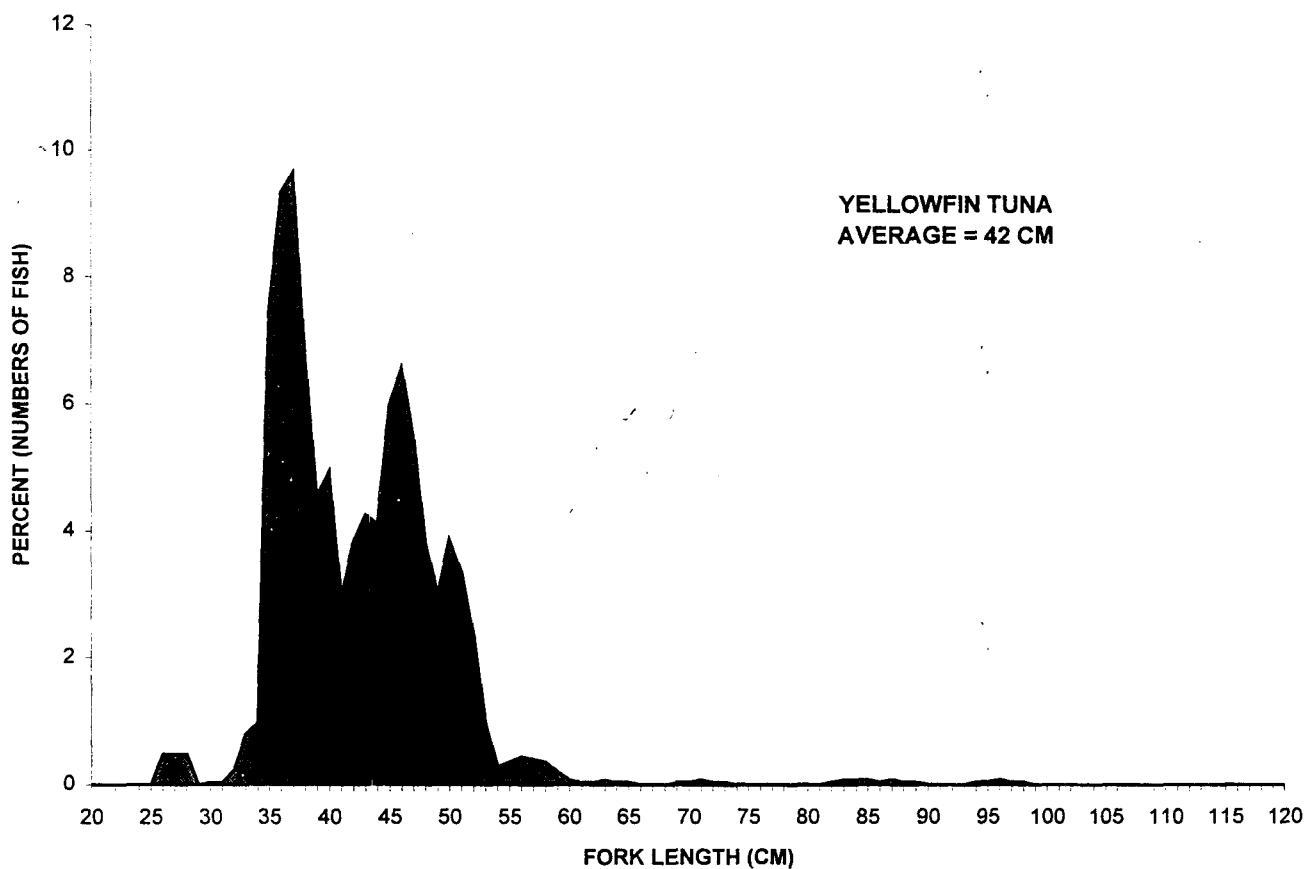
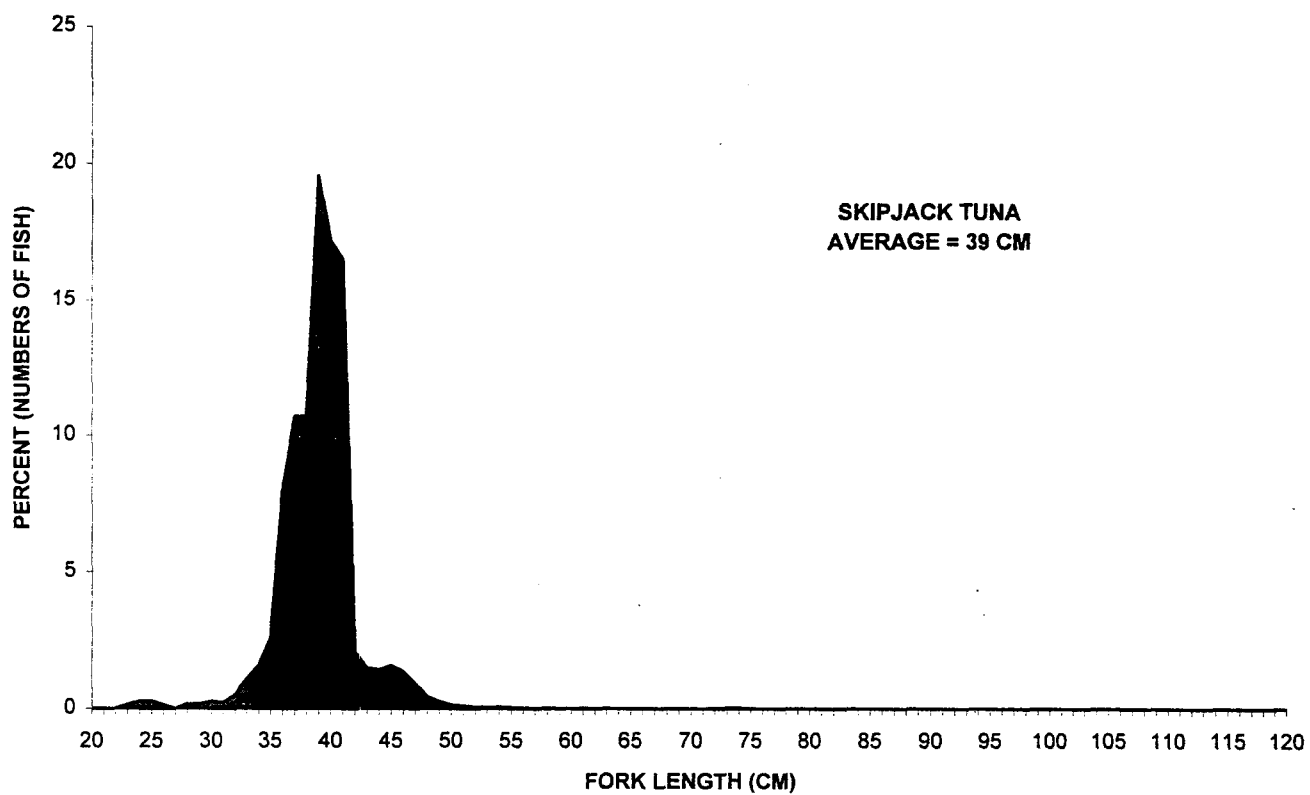


Figure 8c. Length-frequency distributions of catches from the 1997 Northern Marianas troll/handline fishery.