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in the central-western Pacific
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June 1999

Working document for the 12th Standing Committee on Tuna and Billfish, Papeete, Tahiti, June 16-23, 1999.

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INTRODUCTION

Distant-water, small-scale commercial and artisanal fisheries of the United States target tropical tunas and billfishes in the central-western Pacific with purse seine, longline, pole-and-line, troll or handline fishing gears. In the South Pacific, U.S. troll and longline vessels target albacore. The small-scale and 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 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 1994 to 1998. While other species are caught by these fisheries, the scope of this report has been limited to catches of yellowfin, skipjack and bigeye tuna, blue and striped marlin and South Pacific albacore. Special emphasis is given to comparisons of the 1997 and 1998 fishing seasons including a summary on the disposition of catches, size distributions of the major species in the 1998 catch, by-catch estimates for 1998 and finally an outlook for the fisheries in 1999.

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.

Total catch in 1998 rebounded from a declining trend that started in 1995 and increased from 144,082 t in 1997 to 176,763 t in 1998 (Table 1). The rebound was led by the skipjack tuna catch that increased over 59%. The fleet size increased from 35 vessels in 1997 to 39 in 1998. In 1994-1996 and in 1998 skipjack tuna comprised between 70-80% of the catch; in 1997 skipjack tuna accounted for only 59% of the catch. In 1998 as in 1997, the fleet concentrated the majority of its sets on drifting objects; 55%.

The majority (89%) of the 1998, U.S. purse seine catch was landed at, or transshipped to, canneries in American Samoa. The rest of the catch was landed in the Solomon Islands (6%), Guam (2%), and other south Pacific Island locations (3%) . Approximately 83% of the 1997 catch was processed in American Samoa. The remainder was exported to other canneries in the Pacific region, Puerto Rico and Europe.

Tropical tunas in U.S. purse seine catches were measured for fork length (FL) as vessels unloaded in American Samoa and on board vessels by Forum Fisheries Agency (FFA) observers. Results of both sampling programs were very similar (Figure 2). The mean size of skipjack tuna, in 1998, was 49 cm FL, while yellowfin tuna and bigeye tuna averaged 70 and 54 cm FL respectively (Figure 2). In 1997, mean sizes were larger; 53 cm FL for skipjack tuna, 76 cm FL for yellowfin tuna, and 61 cm FL for bigeye tuna. In 1997 and 1998, larger fish were caught in free-swimming schools while smaller fish were caught in drifting object schools.

Longline Fisheries

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

The Hawaii-based longline fishery accounts for approximately 90% of the U.S. central-western Pacific longline catch (Table 2). The primary target species is bigeye tuna and swordfish. Catches of tropical tunas and billfish (excluding swordfish, *Xiphias gladius*) increased from 4,543 t in 1997 to 4,802 t in 1998. The increase in catch is attributed to record high bigeye tuna catches that increased 32% in 1998. The number of vessels participating in the fishery increased from 105 in 1997 to 114 in 1998. 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 the local fish auction. Size sampling of the catch is conducted in Hawaii at the fish auction where fish are measured for processed weight and converted to round weight in pounds. In 1998, the average size of yellowfin tuna caught was 35 kg, bigeye tuna 33 kg, striped marlin 27 kg and blue marlin 75 kg.

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 1998, there were 27 vessels actively fishing, up from 22 in 1997, and consequently, albacore catches also increased from 300 t in 1997 to 454 t in 1998. Lesser quantities of skipjack, yellowfin and bigeye tuna and blue marlin were also caught.

As in the past, the 1998 fishery landed directly to local canneries or markets. Skipjack, yellowfin and bigeye tuna and albacore, in the 1998 catch, were measured at the canneries and averaged 61, 95, 115 and 99 cm, respectively (Figure 4).

The small-scale longline fishery based in the Marshall Islands - FSM targets mainly yellowfin tuna. Five vessels fished in 1997, and four in 1998 (Table 2). In 1997, 160 t of yellowfin tuna, bigeye tuna and South Pacific albacore were landed and in 1998, 175 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 120°W longitude (Figure 5) and targets South Pacific albacore. Catches peaked in the 1995-96 fishing season (December-March) at 2,186 t, decreased to 1,403 t in the 1996-97 season and increased to 1,721 t in the 1997-98 season (Table 3). The number of vessels fishing peaked at 50 in the 1995-96 fishing season, decreased to 28 in the 1996-97 season then increased to 35 in the 1997-98 season. The 1997-98 distant-water troll fishery delivered primarily to canneries in Fiji. However, some landings were also made in American Samoa. The fishery was sampled for sizes of fish in the catch as the vessels unloaded in American Samoa. Due to limited landings in American Samoa only 200 fish were sampled. The average size of fish landed in the 1997-98 season was 66 cm (Figure 6).

Small-scale and artisanal troll and handline fisheries are conducted in 4 areas; Hawaii, 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 then the Northern Marianas and American Samoa with 4% and 3% respectively. Catches in 1998 were mainly yellowfin and skipjack tuna (71%) and decreased slightly from 2,700 t in 1997 to 2,500 t in 1998 (Table 4). 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 1998 landings for all except the Hawaii-based fishery are shown in Figures 7a-c. Average sizes of both yellowfin and skipjack tunas in the 1998 American Samoa fishery are generally larger than those in either the Guam or Northern Marianas fisheries.

Pole-and-line Fishery

The pole-and-line fishery is based in Hawaii. The fleet fishes exclusively in the Hawaiian EEZ. Catches are predominately skipjack tuna (99%) with small quantities of yellowfin tuna (1%). Total catch peaked in 1997 at 883 t and decreased to 338 t in 1998 (Table 5). Catches from this fishery are landed at local fish markets and are limited to maximize revenues while meeting the needs of these markets. Six vessels fished in 1998, down from 7 in 1997.

BY-CATCHES

By-catch estimates for 1998 U.S. fisheries in the central-western Pacific are available for the distant-water purse seine and Hawaii-based longline fisheries. Starting with the 1998-99 season, the U.S. distant-water troll fishery will be required to record by-catch in logbooks.

Discarded by-catch in the distant-water purse seine fishery is reported on the vessel's Regional Purse Seine Logbook. Since recording of discarded by-catch is voluntary, their reliability and completeness is questionable. In 1998, 52% of the trips reported discarding by-catches of tunas and 72% reported discarding by-catches of other species. Approximately 840 t of tunas and 250 t of by-catch species were discarded at sea (Table 6). Skipjack tuna was the most frequently discarded tuna species. Among the by-catch species, rainbow runner, *Elagatis bipinnulata* were the most frequently discarded, followed by baitfish, sharks, and marlins.

Discarded by-catch is reported in number of fish in the NMFS Western Pacific Daily Longline Fishing Logbook data. Logbook data are self reported by vessel operators and therefore accuracy is questionable. Since almost all the species caught by the longline fishery are marketable, there is a good economic incentive for longline fishermen to return to port with most of what they catch. Ninety-three of 114 boats (82%) or 662 of 1,140 total trips (58%) reported discards. Sharks made up 80% of the discarded by-catch (1,820 t). Billfish (214 t) and tunas (209 t) each made up about 9% of the total longline discarded by-catch. Other miscellaneous pelagic species (29 t) such as oilfish (*Ruvettus pretiosus*), mahimahi (*Coryphaena hippuras*), moonfish (*Mene maculata*), wahoo (*Acanthocybium solandri*), pomfrets (*Pompus spp.*), and barracuda (*Sphyrna spp.*) made up the remainder of the discarded by-catch.

OUTLOOK FOR 1999

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 1999. The U.S. distant-water purse seine fishery in 1999 should be very similar to the 1998 fishery. Logbooks received so far in 1999 indicate that the fleet is continuing to fish in areas west of 180° longitude. The majority of the catch has come from waters between Kirabati, Tuvalu and Papua New Guinea, however, if El Niño conditions such as those in 1997 reoccur, the fleet will likely shift to the east.

The 1998 Hawaii-based longline fishery continued to target mainly tunas instead of swordfish. The shift in target was caused partially because restaurant boycotts on Atlantic swordfish depressed swordfish prices in 1998. While the fishery will probably continue to target tunas in 1999, swordfish prices are starting to recover and may motivate the fleet to direct more effort towards swordfish.

The 1998-99 fishing season for the distant-water troll fleet has ended and the preliminary estimate of the South Pacific albacore catch is 1,089 t. Most of the vessels unloaded in American Samoa.

Table 1. Catches¹ (metric tons) and number of vessels for the U.S. central-western Pacific purse seine fishery 1994-1998. Values for 1998 are preliminary.

YEAR	VESSELS	TROPICAL TUNAS			TOTAL
		SKIPJACK	YELLOWFIN	BIGEYE	
1994	49	151,486	56,426	1,711	209,623
1995	44	132,518	31,845	3,190	167,553
1996	40	120,127	19,417	9,860	149,404
1997	35	84,729	50,208	9,145	144,082
1998	39	135,024	36,231	5,508	176,763

¹ Catches include discards.

Table 2. Catches (metric tons) and number of vessels for U.S. central-western Pacific longline fisheries 1994-1998. Values for 1998 are preliminary.

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

HAWAII

1994	125	54	607	1,791	363	327		3,142
1995	110	103	972	2,055	575	543		4,248
1996	103	41	631	1,796	468	420		3,356
1997	105	106	1,143	2,454	488	352		4,543
1998	114	76	722	3,231	394	379		4,802

AMERICAN SAMOA

1994								0
1995	6	<1	2		3		25	31
1996	13	<1	11	4	9		84	109
1997	22	1	22	4	14		300	341
1998	27	18	40	3	20		454	535

MARSHALL ISLANDS/FEDERATED STATES OF MICRONESIA

1994	16		108	28			34	170
1995	17		236	131			27	394
1996	12		265	145			15	425

1997	5		106	46			8	160
1998	4		105	39			31	175

Table 3. Catches (metric tons) and number of vessels for the U.S. distant-water troll fishery, 1993-1994 to 1997-1998. Values for 1997-98 are preliminary.

YEAR	TROLL	
	VESSELS	ALBACORE
1993-94	14	530
1994-95	21	2,092
1995-96	50	2,186
1996-97	28	1,403
1997-98	35	1,721

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, 1994-1998 (NA indicates that data are not available). Values for 1998 are preliminary.

YEAR	VESSELS	TROPICAL TUNAS			MARLINS		TOTAL
		SKIPJACK	YELLOWFIN	BIGEYE	BLUE	STRIPED	
HAWAII-BASED SMALL-SCALE TROLL/HANDLINE							
1994	NA	148	1,266	164	301	35	1,914
1995	NA	155	1,266	68	318	53	1,860
1996	NA	224	1,124	185	404	54	1,991
1997	NA	196	944	92	374	39	1,645
1998	NA	150	919	163	224	23	1,479
AMERICAN SAMOA, GUAM, NORTHERN MARIANAS TROLL/HANDLINE							
1994	NA	196	60		62		318
1995	750	216	71		60		1,097
1996	750	192	91		37		1,070
1997	750	167	60		47		1,024
1998	750	166	71		22		1,009

Table 5. Catches (metric tons) and number of vessels for the U.S. central-western Pacific pole- and-line fishery 1994-1998 (NA indicates that data are not available). Values for 1998 are preliminary.

YEAR	VESSELS	TROPICAL TUNAS		TOTAL
		SKIPJACK	YELLOWFIN	
1994	7	515	9	524
1995	7	571	16	587
1996	7	837	1	838
1997	7	883	0	883
1998	6	337	1	338

Table 6. Logbook reports¹ of discarded by-catch and retained catch from U.S. tuna purse seiners fishing in the central-western Pacific Ocean in 1998.

Species	Weight (t) Discarded	Weight (t) Retained
Tunas	840.00	175,923.00
Billfishes		0.00
Black marlin	0.32	
Blue marlin	1.29	
Marlin	10.90	
Sailfish	0.05	
Sharks		0.00
Sharks	21.22	
Others		0.00
"Baitfish" ²	65.51	
Dolphinfish	0.07	
Dolphinfish/barracuda	0.05	
Mackerel	1.04	
Mackerel/"baitfish"	3.80	
Mackerel scad/rainbow runner	8.51	
Manta ray	0.23	
Marlin/rainbow runner	0.02	
Marlin/shark ³	0.42	
Oceanic whitetip shark/triggerfish ³	0.07	
Rainbow runner	126.83	
Rainbow runner/mackerel	2.00	
Rainbow runner/triggerfish	0.21	
Shark/rainbow runner ³	1.39	
Shark/rainbow runner/scad mackerel ³	5.09	
Sunfish	0.03	
Triggerfish	0.31	
Triggerfish/"baitfish"	0.01	
Unknown species	1.92	

¹ Fishermen are instructed to report by-catch in weight or numbers. Reports in numbers were not used and consisted of 19 marlins, 209 sharks and 2,000 rainbow runners caught and discarded.

² Included mackerel, bonito, and other species.

³ Sharks were sometimes reported in combination with other species.

Table 7. Logbook reports of discarded by-catch¹ and retained catch from the Hawaii-based longline fishery in the central-western Pacific Ocean in 1998.

Species	Weight (t) Discarded	Weight (t) Retained
Billfish		
Blue marlin	6	387
Striped marlin	6	377
Marlins	4	176
Swordfish	198	3,268
Sharks		
Blue sharks	1,594	2,512
Mako	23	88
Thresher	177	115
Sharks ²	26	106
Tunas		
Albacore	99	1,113
Bigeye tuna	91	3,227
Bluefin tuna	2	116
Skipjack tuna	1	76
Yellowfin tuna	16	721
Other pelagics		
Mahimahi	7	150
Moonfish	3	419
Oilfish	15	12
Pomfret	1	102
Wahoo	2	119
Barracuda	1	5

¹ By-catch in weight is calculated by multiplying the number of fish by the average whole weight. Estimates are based on date of landing; not actual date of capture.

² Sharks were reported into a general Ashark@ category.

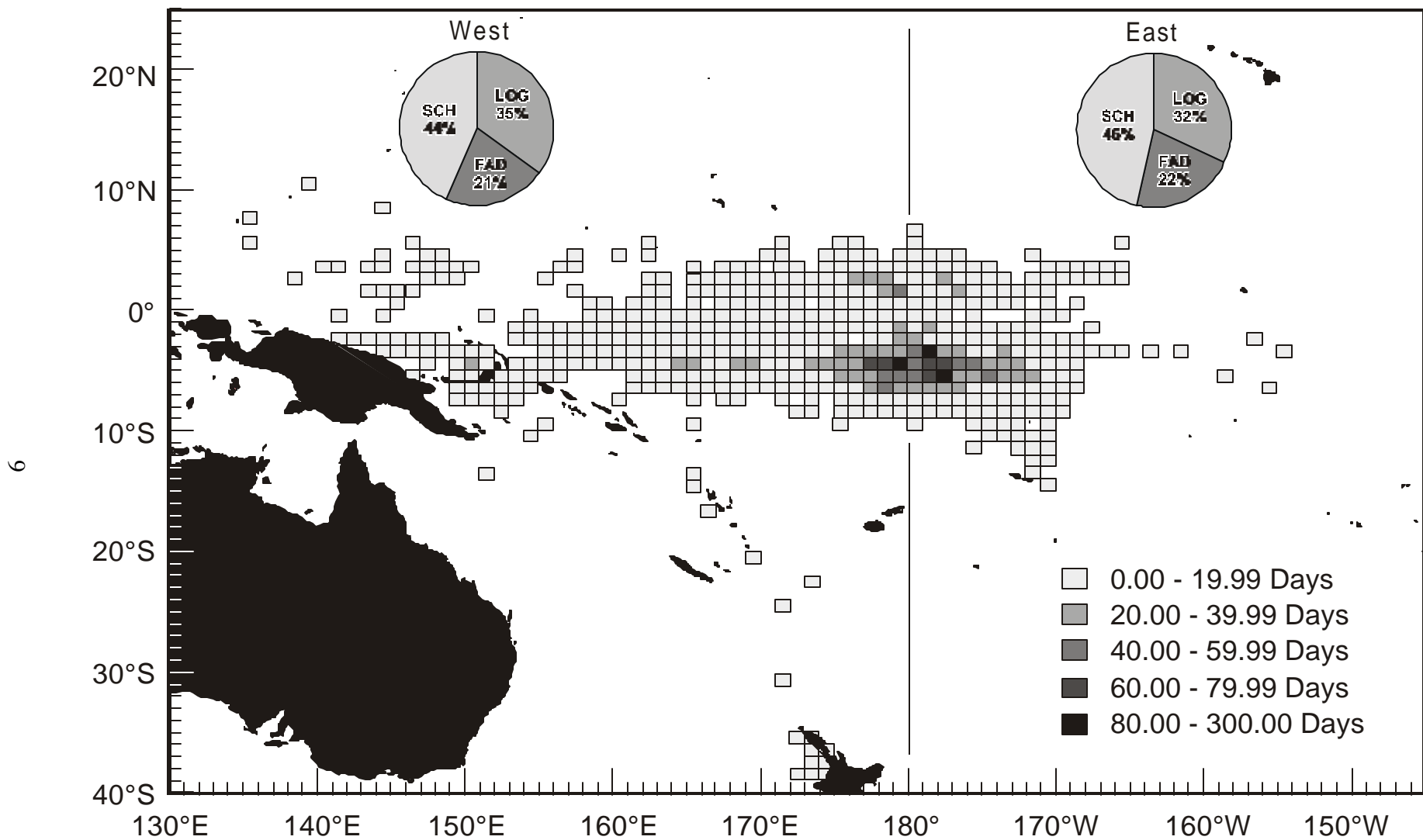


Figure 1. Distribution of fishing effort (days fished) for the 1998 U.S. tuna purse seine fishery in the central-western Pacific Ocean. Proportion of types of sets for east and west of 180E is shown in pie diagrams.

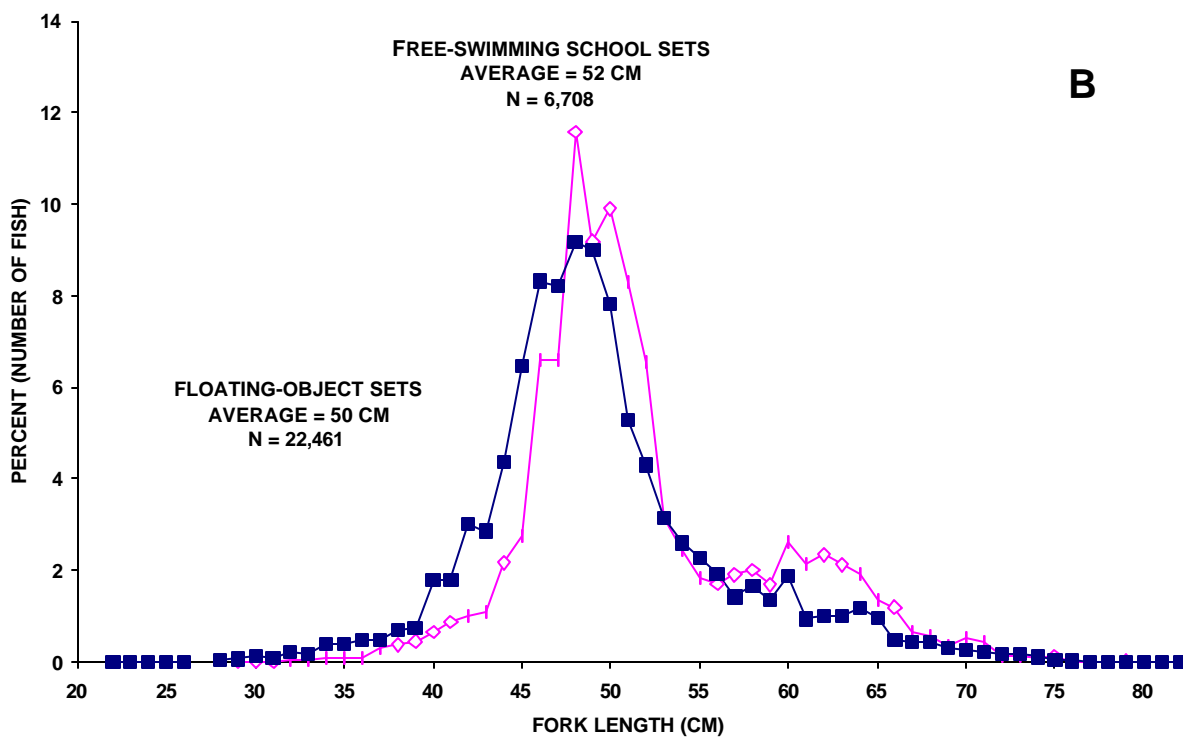
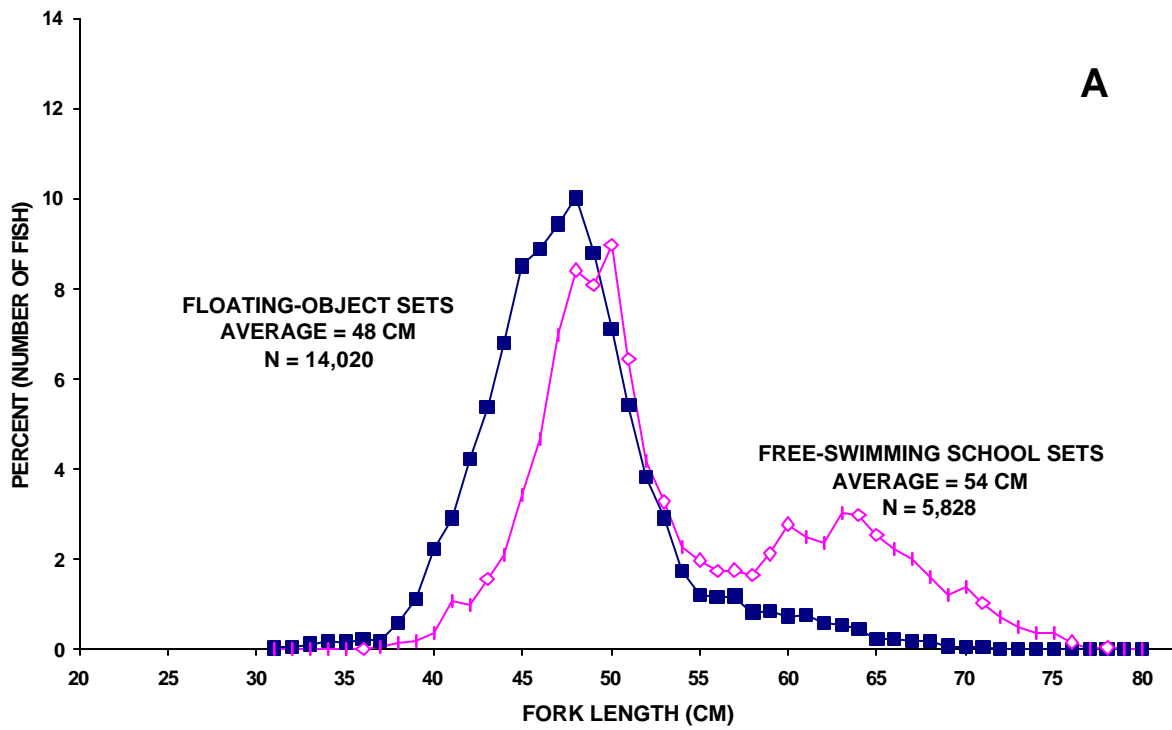


Figure 2a. Size-frequency distribution of skipjack tuna caught in floating-object sets and free-swimming school sets by U.S. tuna purse seiners fishing in the central-western Pacific Ocean in 1998. Measurements were taken by port samplers (A) and observers (B).

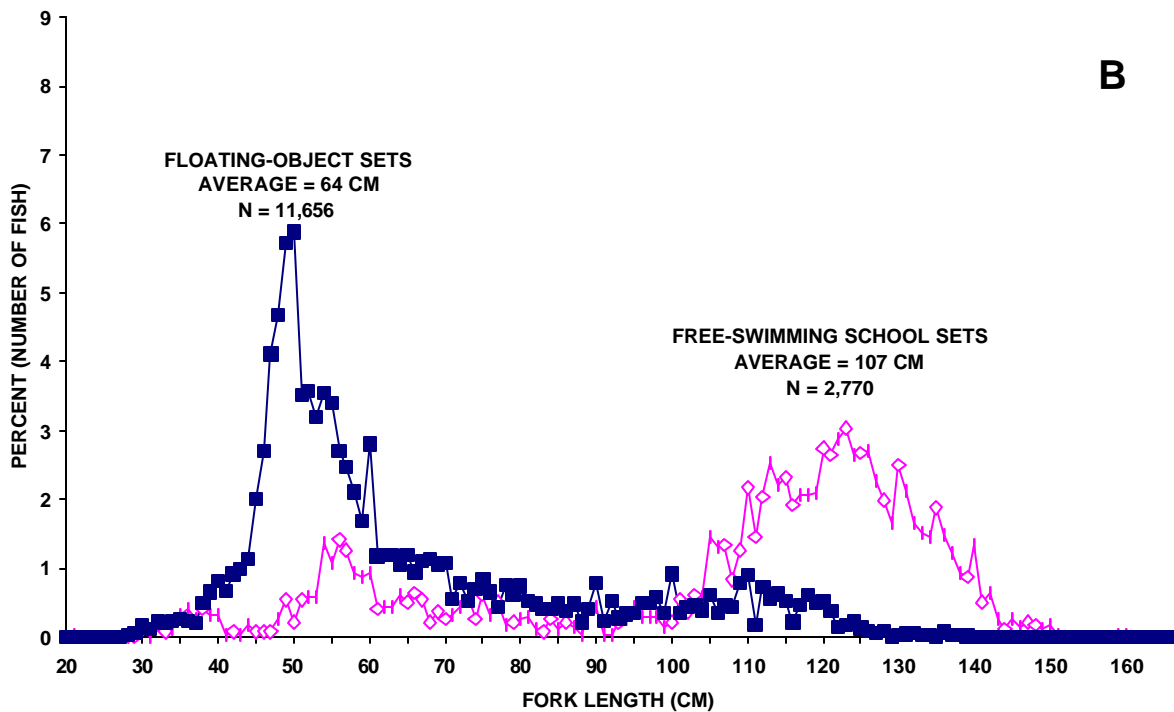
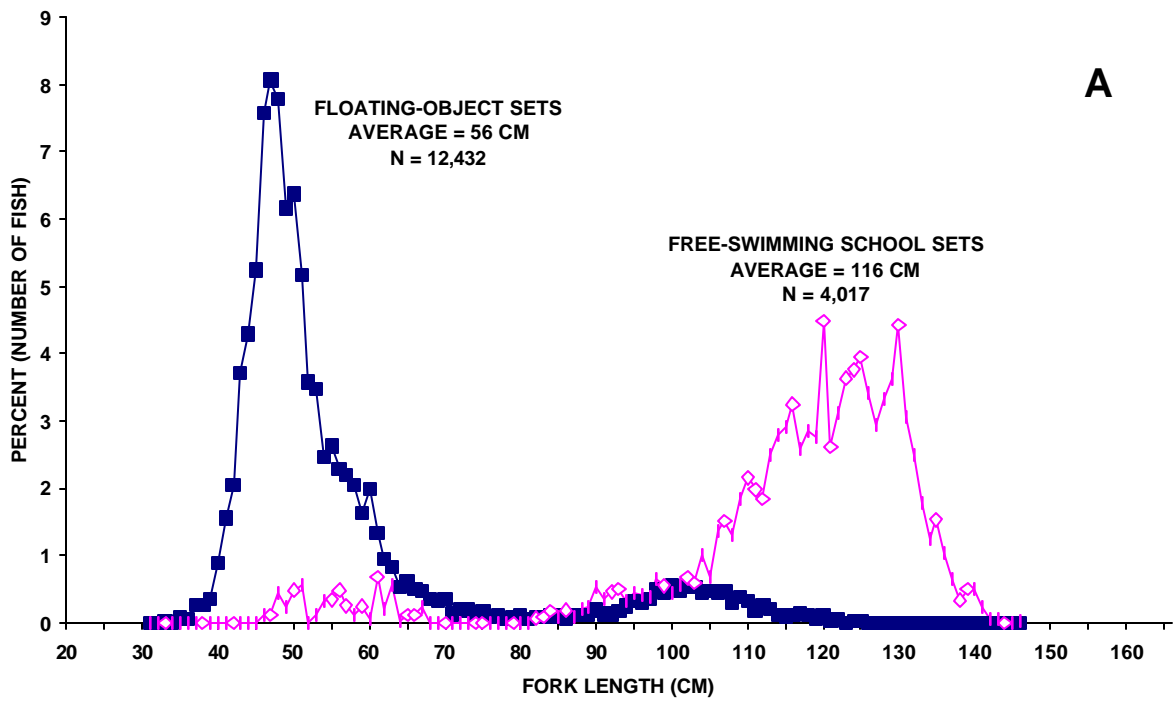


Figure 2b. Size-frequency distribution of yellowfin tuna caught in floating-object sets and free-swimming school sets by U.S. tuna purse seiners fishing in the central-western Pacific Ocean in 1998. Measurements were taken by port samplers (A) and observers (B).

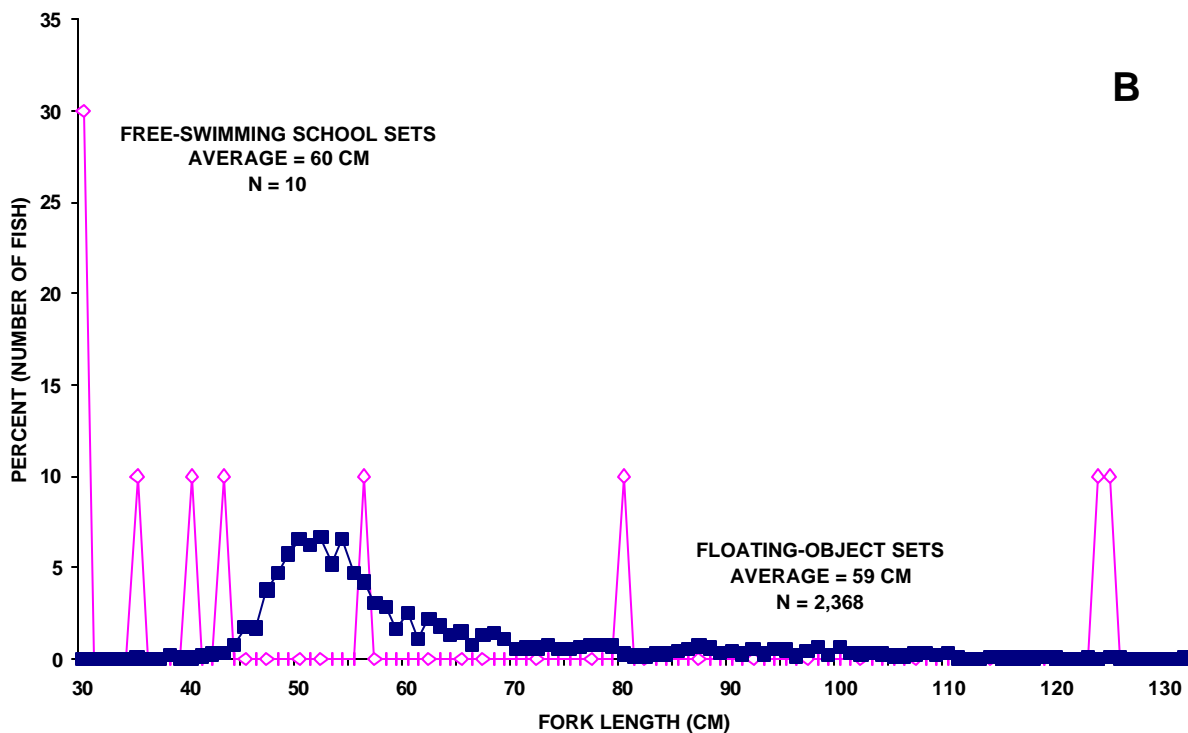
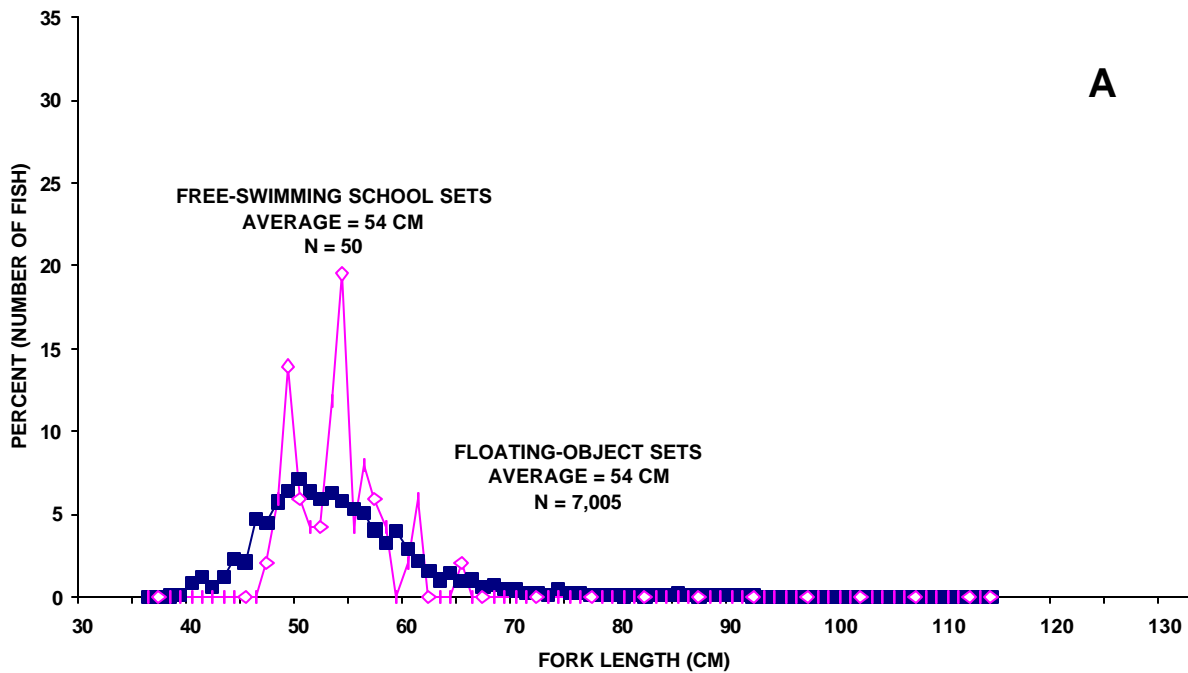


Figure 2c. Size-frequency distribution of bigeye tuna caught in floating-object sets and free-swimming school sets by U.S. tuna purse seiners fishing in the central-western Pacific Ocean in 1998. Measurements were taken by port samplers (A) and observers (B).

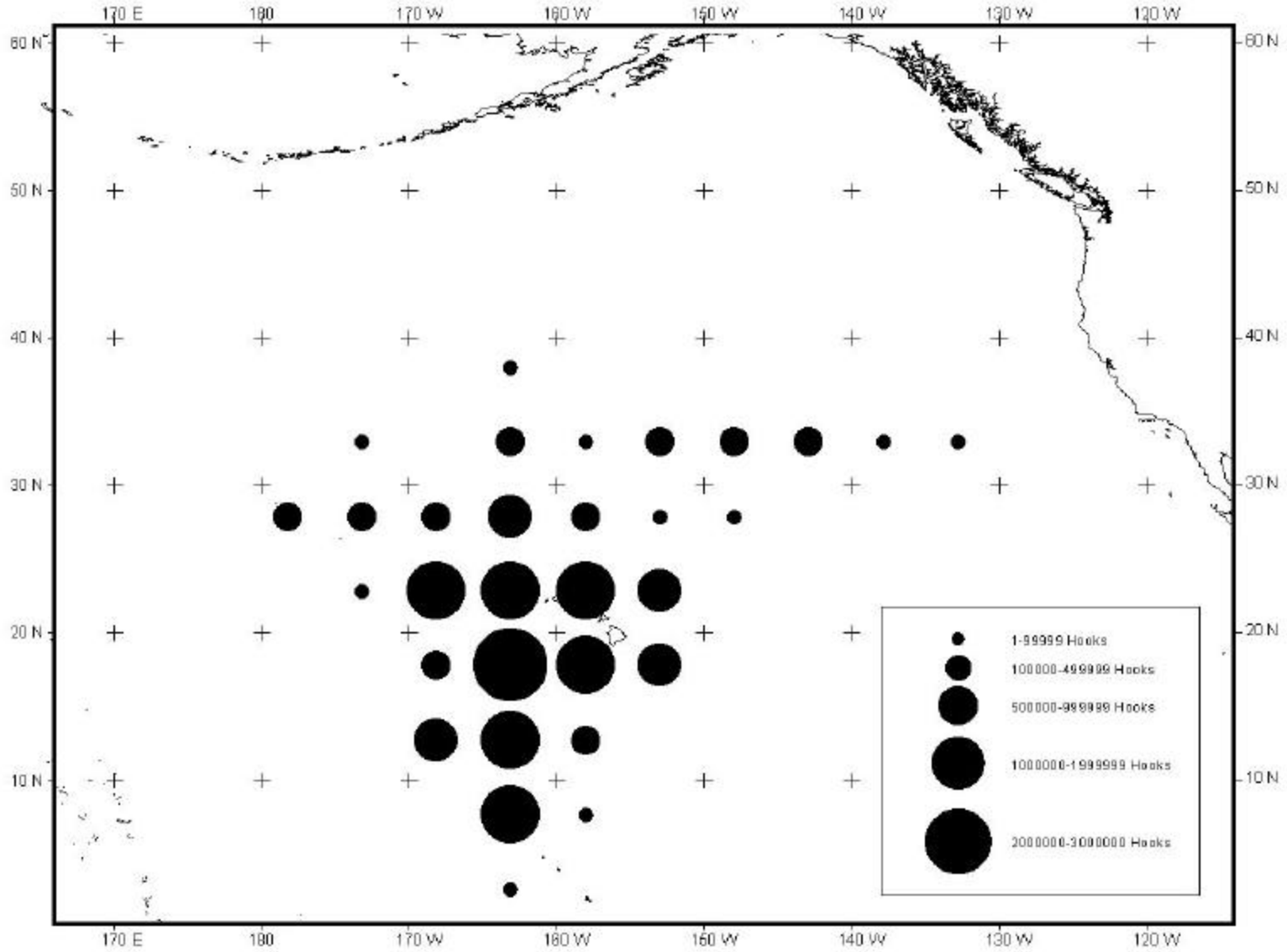


Figure 3. Location of fishing effort (number of hooks) for the 1998 Hawaii-based longline fishery.

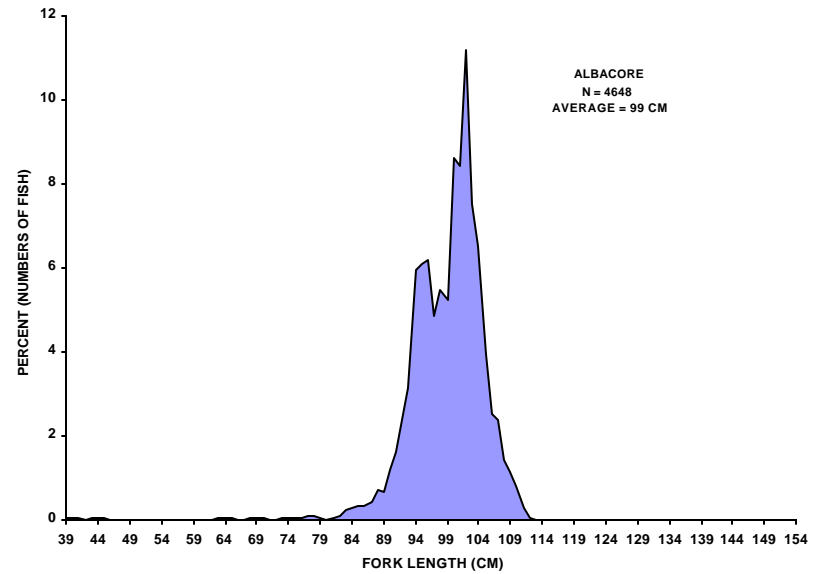
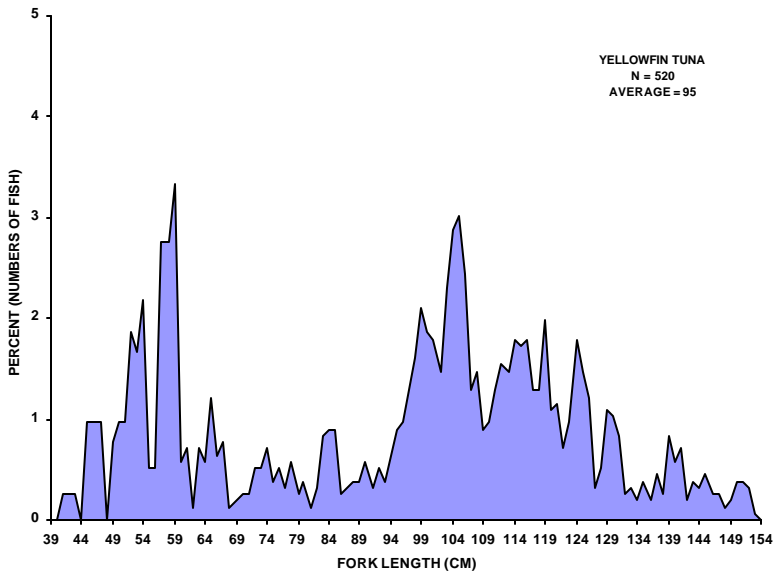
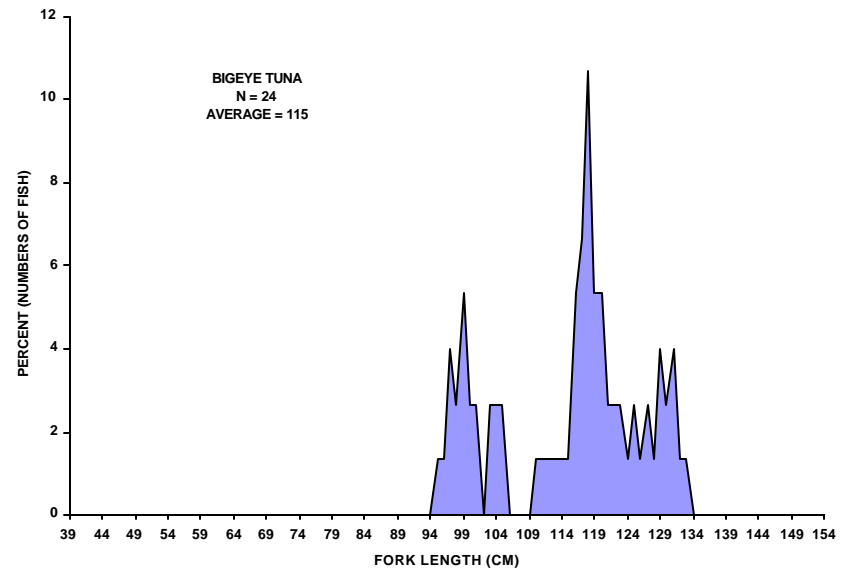
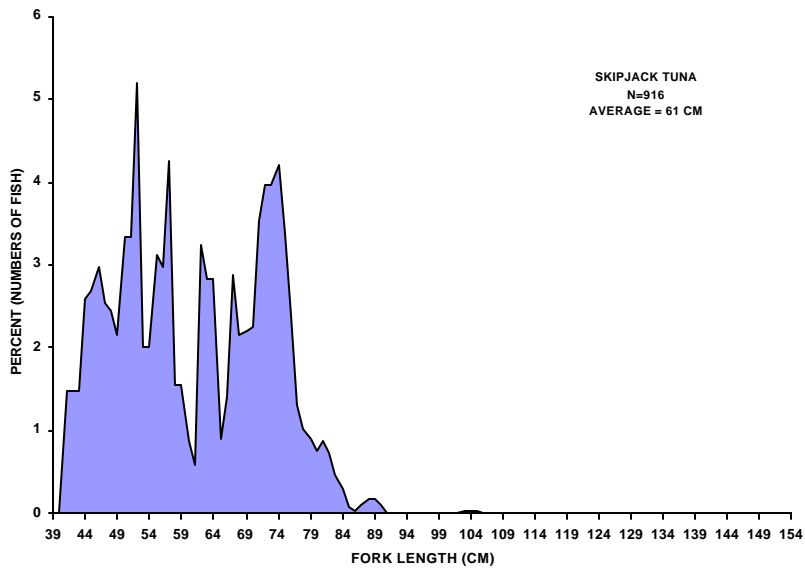


Figure 4. Length-frequency distributions of catches from the 1998 American Samoa longline fishery.

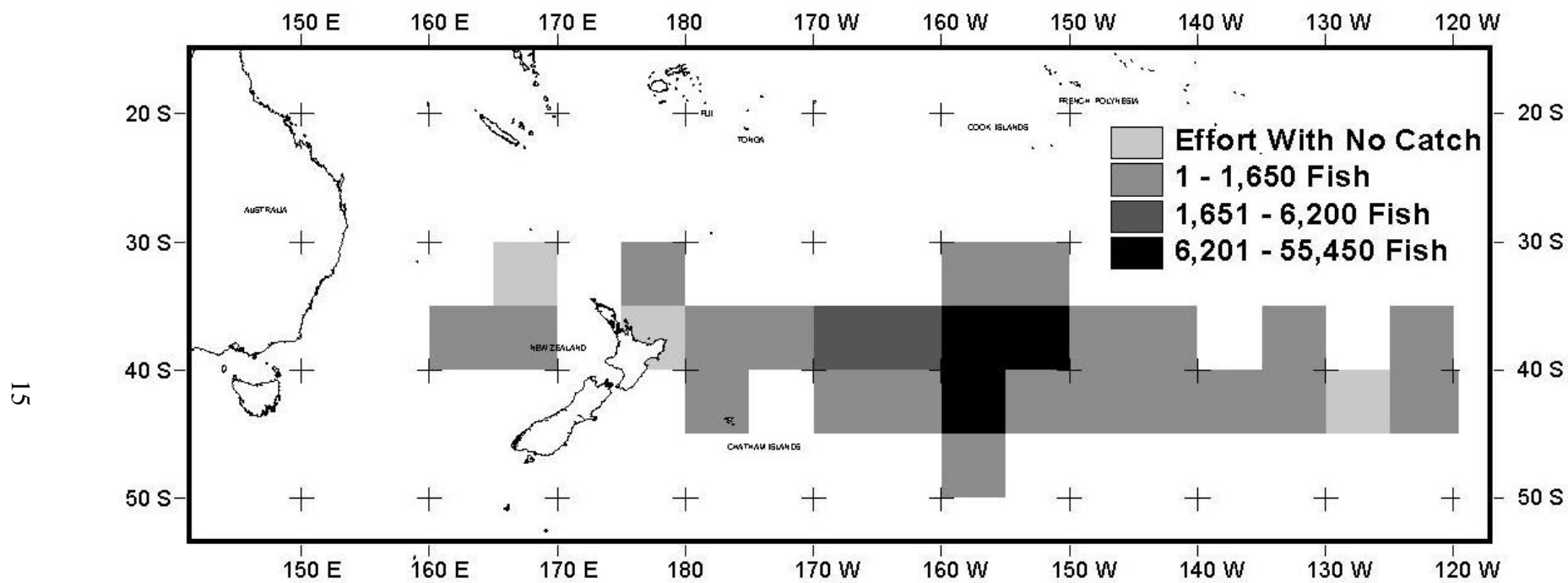


Figure 5. Location of South Pacific albacore catches from 1997-98 U.S. distant-water troll fishery.

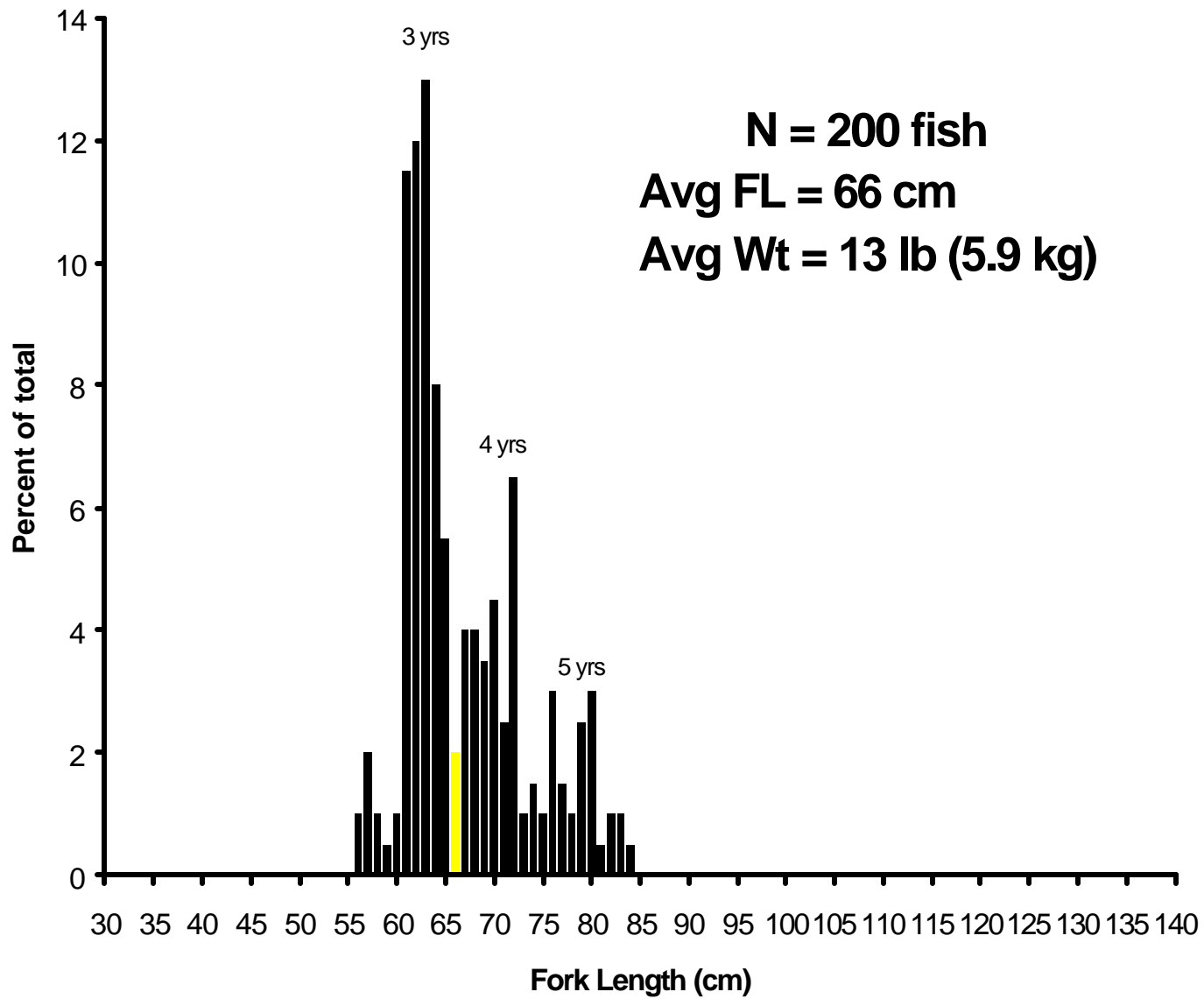


Figure 6. Length-frequency distribution of South Pacific albacore caught in the 1997-98 U.S. distant-water troll fishery.

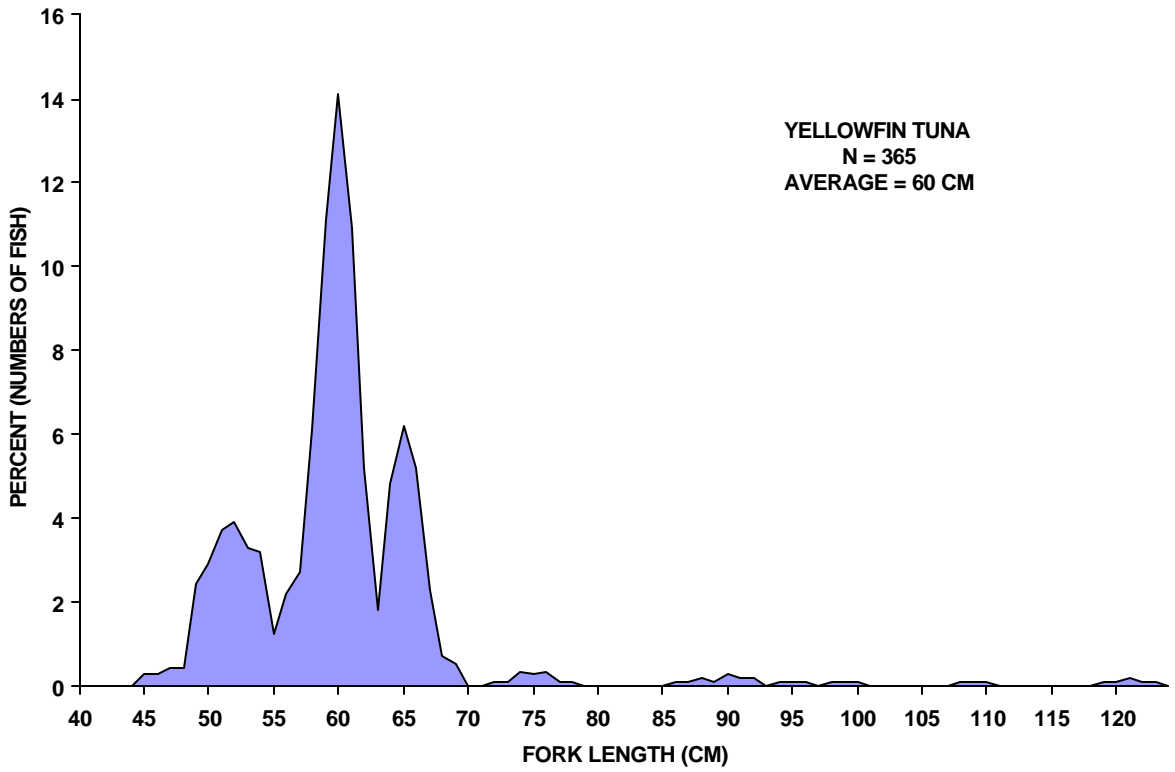
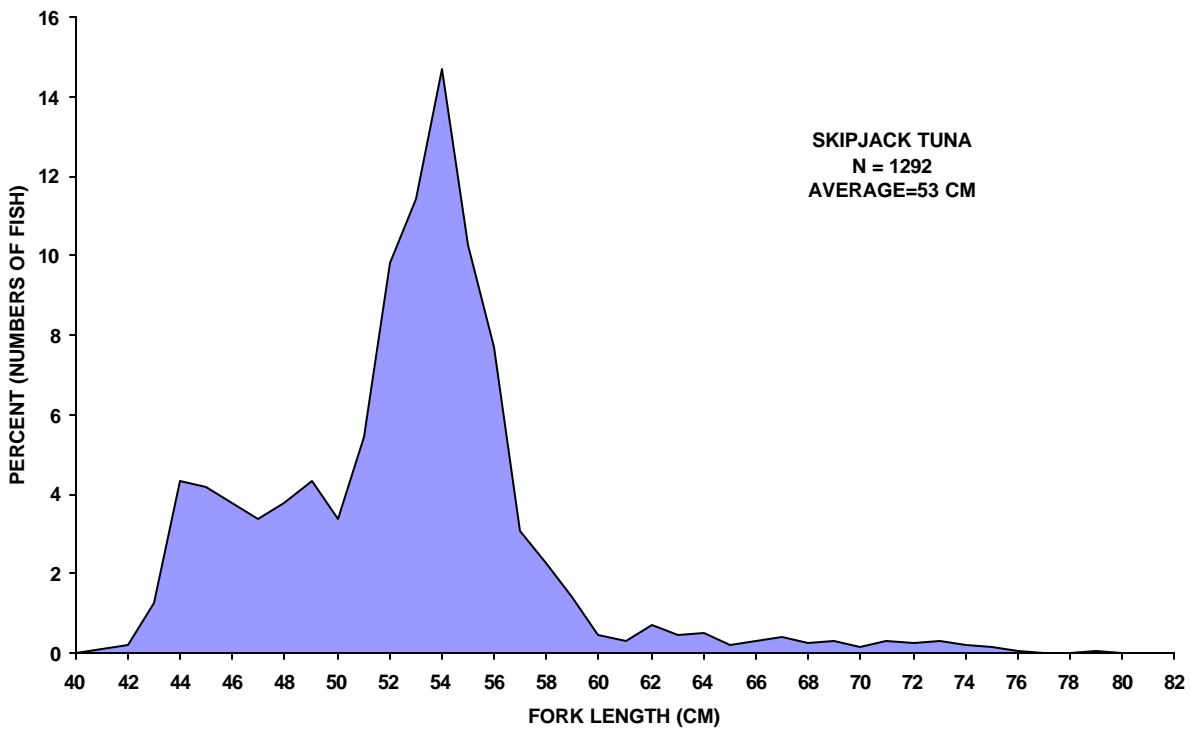


Figure 7a. Length-frequency distributions of skipjack and yellowfin tuna from the 1998 American Samoa troll/handline fishery.

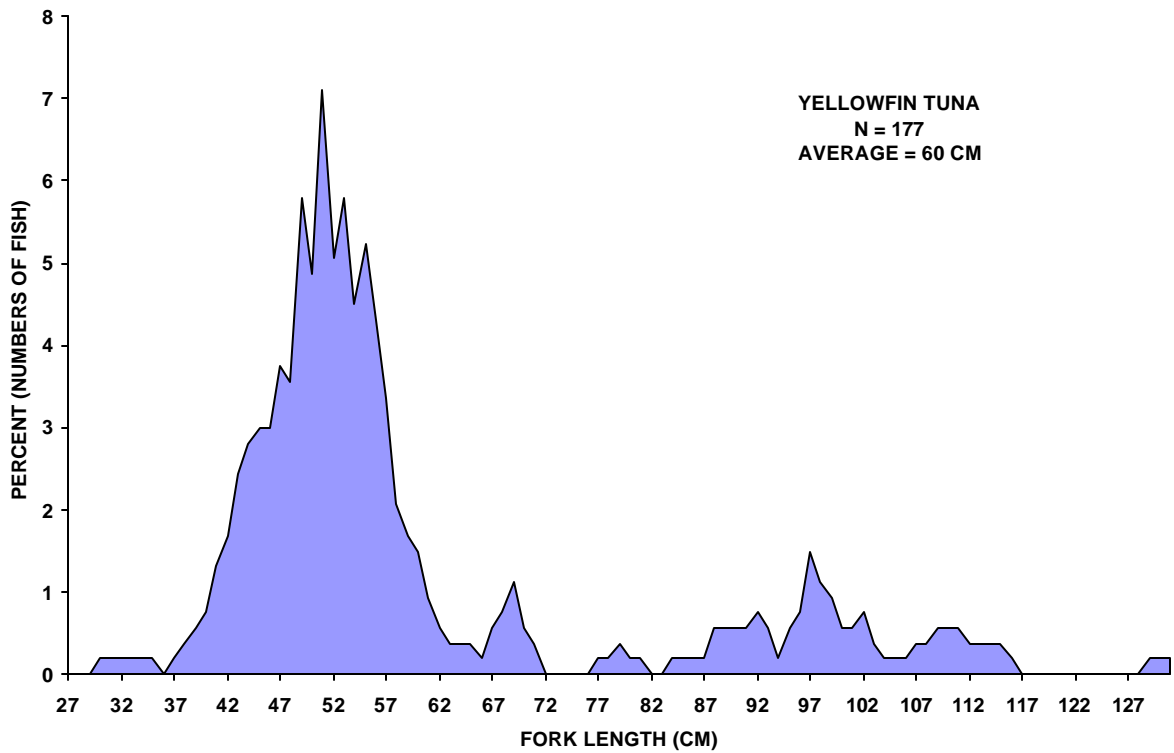
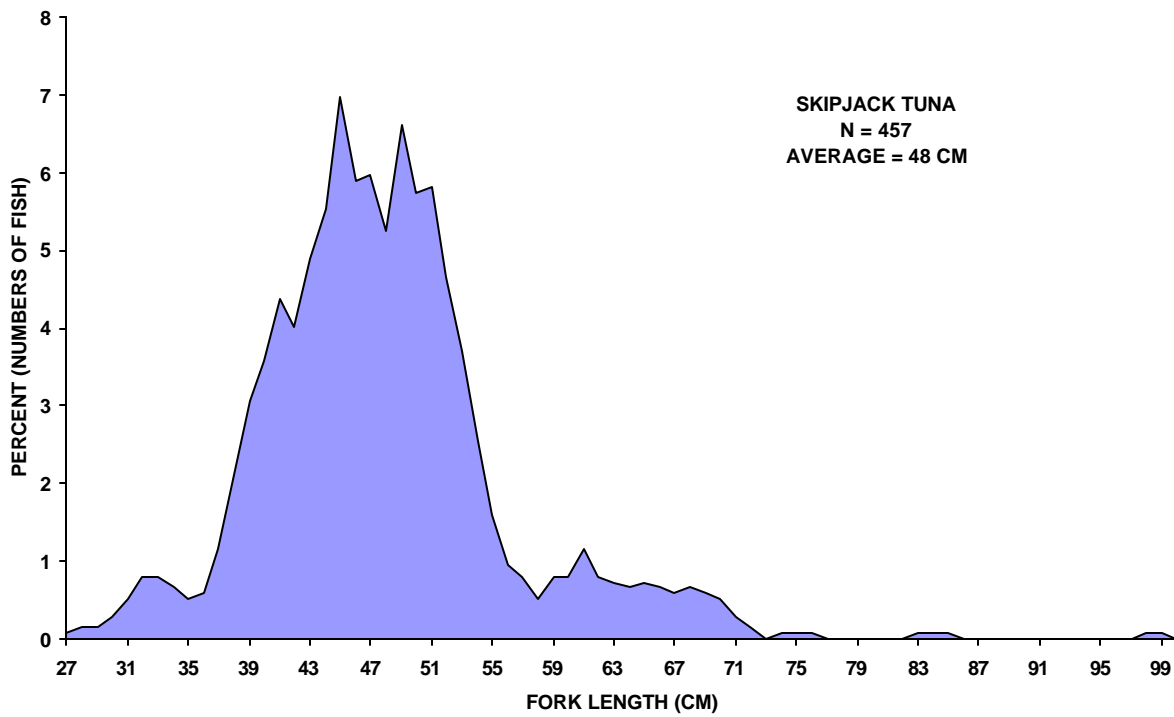


Figure 7b. Length-frequency distributions of skipjack and yellowfin tuna from the 1998 Guam troll/handline fishery.

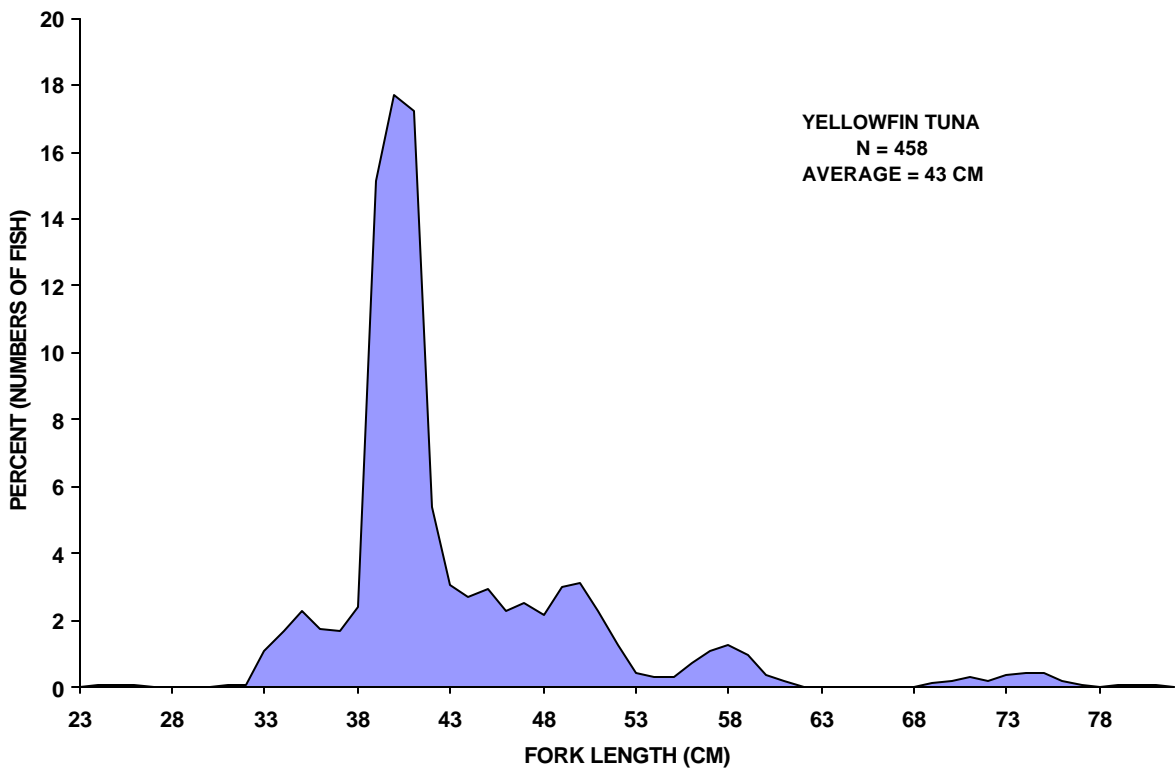
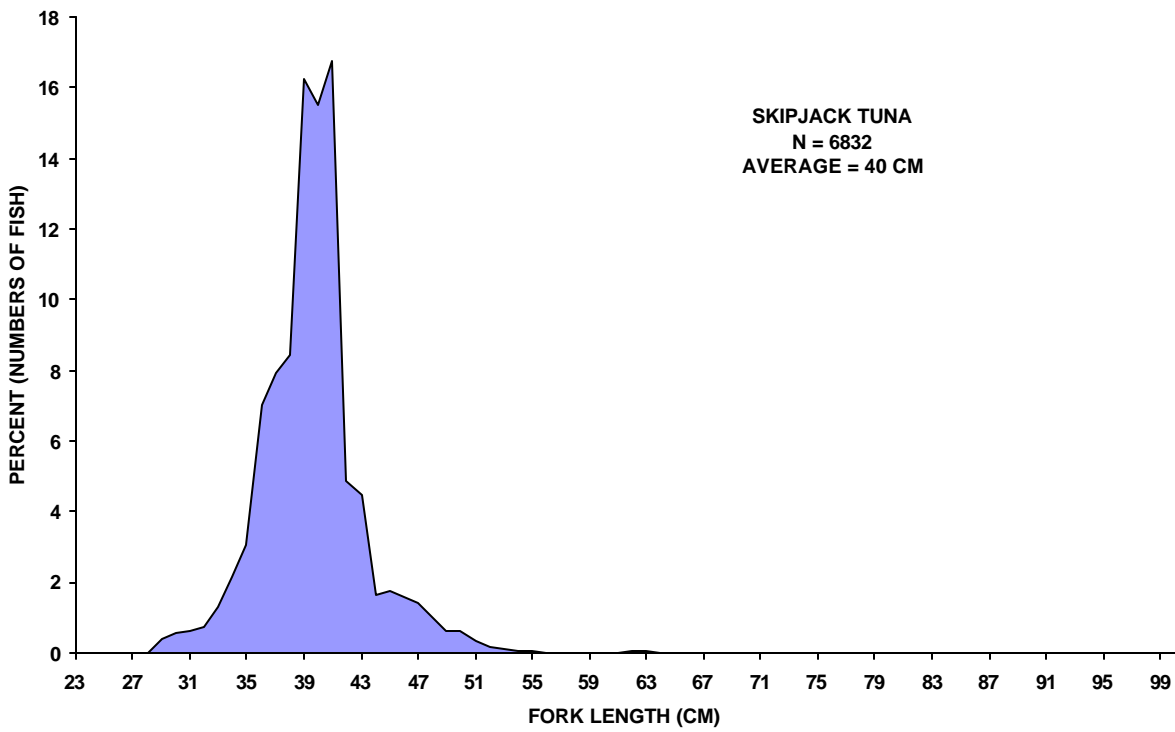


Figure 7c. Length-frequency distributions of skipjack and yellowfin tuna from the 1998 Northern Marianas troll/handline fishery.