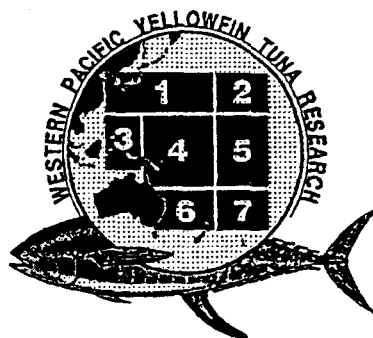




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in the central and western Pacific, 1992-1994

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U.S. FISHERIES CATCHING YELLOWFIN TUNA IN THE CENTRAL AND WESTERN PACIFIC, 1992-1994

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INTRODUCTION

Yellowfin tuna landings for the period 1988 to 1993, from U.S. commercial and artisanal fisheries in the central and western Pacific, have averaged approximately 44,000 t annually. These fisheries use a variety of fishing gears and target a variety of pelagic species including yellowfin tuna. However, for most of these fisheries, yellowfin tuna is an incidental catch.

Commercial tuna fisheries have operated out of Hawaii since the early 1950s using longline, pole-and-line, troll, and handline fishing gears. These fisheries account for approximately 4% of the annual U.S. yellowfin tuna landings in the central and western Pacific. Longline vessels fish in areas as far away as 1,000 nm north of the Hawaiian Islands, and vessels using other gears usually operate within the 200-mile Hawaiian EEZ. Longline gear recently have been used to target swordfish, pole-and-line for skipjack tuna, and handline and troll for yellowfin or bigeye tunas.

Commercial distant-water tuna purse seiners have operated continuously out of American Samoa or Tinian since 1976, and since 1988, have fished under the South Pacific Regional Tuna Treaty (SPTT). The fleet accounts for approximately 95% of the annual U.S. yellowfin tuna landings from the central and western Pacific. Purse seiners target both skipjack and yellowfin tunas; however, the majority of the catch is skipjack tuna.

Artisanal fisheries operate off Guam, American Samoa and the Northern Marianas, and land a variety of tuna and tuna-like species. These fisheries use mainly troll fishing gear, fish mainly inside the U.S. EEZ, and account for less than 1% of the annual U.S. yellowfin tuna landings from the central and western Pacific.

This report presents yellowfin tuna landings data collected from U.S. central and western Pacific fisheries during the period 1992 to 1993. It also reviews logbook and biological data collected from the U.S. distant-water purse seine fishery, since these data for the other U.S. fisheries are not available. Data for previous years are for comparison purposes. Data for 1994 are preliminary and represent catches for January to March.

DATA COLLECTION

Tuna landings data were collected from all U.S. fisheries by the National Marine Fisheries Service, Hawaii Department of Aquatic Resources, and various other agencies in American Samoa, Guam, and the Northern Marianas. The data were compiled from landing receipts or landing surveys prepared at the time of landing or sale of fish.

Since 1980, logbook data were collected from the U.S. distant-water tuna purse seiners in American Samoa and Tinian. Catches were recorded daily and the geographical positions at noon or for each purse seine set were recorded to the nearest minute. Coverage was poor during the early years, but has been 100% of the fleet since 1988 when the SPTT went into effect.

Length measurements of yellowfin tunas were collected from purse seine catches by port samplers since 1980. In 1993, over 37,000 yellowfin tuna were measured and in 1992, over 41,000. The sampling objective was to obtain at least 13 fifty-fish samples from each month and area stratum (Figure 1) that produced at least 1,000 t of yellowfin tuna. This objective was achieved in both 1992 and 1993.

LANDINGS AND VESSEL PARTICIPATION

Landings of skipjack and yellowfin tunas from the distant-water tuna purse seine fishery in 1993 (Table 1) decreased approximately 12% from 1992 landings of 208,000 t. Yellowfin tuna accounted for approximately 24% of the total landings in both 1992 and 1993. The decrease in total landings in 1993 was the first recorded since the start of the SPTT, and appears to be the result of decreased fishing effort in 1993 (46 vessels in 1992, 42 vessels in 1993).

Landings of yellowfin tuna from Hawaii commercial and artisanal fisheries increased from 1,361 t in 1992 to 1,770 t in 1993 (Table 2). The majority of the landings are made by troll, handline, and longline fishing gears.

Artisanal fishery landings of yellowfin tuna from Guam, American Samoa, and the Northern Marianas decreased from a high of 89 t in 1992 to 44 t in 1993. The majority of the landings were from Guam and involved mainly troll fishing gear.

DISTANT-WATER TUNA PURSE SEINE FISHERY

The distant-water tuna purse seine fishery in 1992 and 1993 continued to concentrate the majority of its fishing effort in areas south of Kiribati and north of Tuvalu. In both 1992 and 1993, the fleet fished in western Pacific yellowfin (WPYF) areas 4 and 5 (Figure 2). In 1992, 79% of the catch was from WPYF area 4 and in 1993, 95% (Table 3).

The number of trips made by the fleet continued to decline from a high of 200 in 1991 to 160 in 1993 (Figure 3). The fleet averaged 40 to 41 sets per trip in 1992 and 1993, and spent an average of 53 days at sea per trip in 1992 and 56 days per trip in 1993. This compares to 45 sets per trip and 49 days per trip in 1991.

The purse seine fleet made sets on either free swimming schools (school sets) or floating objects (log sets). School fish sets have been the preferred set type used by the fleet since the start of the SPTT, and accounted for 77% of the sets in 1992 and 72% in 1993.

Nominal catch rates (metric tons of yellowfin + skipjack tuna per day fished) continued a decline that started in 1991, from 28 t/day in 1992, to 24 t/day in 1993 (Figure 4). Since yellowfin tuna catch rates held relatively constant at approximately 6.2 to 6.3 t/day in 1992 and 1993, the decline was due to reduced skipjack tuna catches.

SIZES OF YELLOWFIN TUNA IN PURSE SEINE CATCHES

Average sizes (fork length) of yellowfin tunas caught by the distant-water purse seine fleet increased slightly from 68 cm in 1992 to 70 cm in 1993 (Figure 5). On the average, sizes of yellowfin tuna caught in school sets in 1992 and 1993 were 24 to 29 cm larger than those caught in log sets.

While the ranges of sizes of yellowfin tuna caught in 1992 and 1993 were quite similar (38 cm to 145 cm), the length distributions were quite different (Figure 6,7). In 1992, very distinct modes were evident in the 41-61 cm and 81-121 cm ranges, and there was a distinct absence of fish in the 61-81 cm range. However in 1993, the length distribution of yellowfin tuna was flatter with more medium-sized fish, 61 cm to 81 cm long. This increase in medium-sized fish in 1993 was probably the result of a large incoming year class in 1992, a weak incoming year class in 1993 or a change in availability in 1993 or 1992 due to environmental conditions in the area. Preliminary data on yellowfin tuna measurements thus far in 1994 (Figure 8) indicate that the medium-sized fish may be missing again as in 1992.

SUMMARY AND 1994 OUTLOOK

Reduced vessel participation, reduced catches of both yellowfin and skipjack tunas and catch rates, and a slight increase in the average size of yellowfin tuna highlight the differences between the 1992 and 1993 distant-water tuna purse seine fisheries. School fish sets continue to be the dominant set type, and skipjack tuna continues to comprise the majority of the landings. While the ranges of sizes of yellowfin tuna caught by the fleet remained relatively the same in 1992 and 1993, the actual size distributions were quite different with larger fish being caught in 1993 than in 1992.

Preliminary data collected for the 1994 U.S. purse seine fishery indicate that landings of yellowfin tuna, and the average size of yellowfin tuna caught, may increase from those recorded in 1993. The fleet has moved further east and fished areas near Jarvis Island (WPYF area 5) in June where large yellowfin tuna (>120 cm) were found in free-swimming schools.

In 1990, this same area similarly produced large yellowfin tuna, but in January. If this improved yellowfin tuna fishing continues, the total 1994 landing is expected to increase by 5 to 10% over that of 1993.

Yellowfin tuna landings from Hawaii-based commercial and artisanal fisheries have remained relatively stable between 1,500 and 2,100 t during the period 1985 and 1993. While fishing effort may increase, yellowfin tuna landings in 1994 are expected to remain in this range since most of the effort will likely target swordfish.

Yellowfin tuna landings in American Samoa and the Northern Marianas have remained relatively stable over the years while Guam landings have returned to historical levels since the high recorded in 1992. Total landings from these three fisheries in 1994 are expected to remain below 50 t.

Table 1. Total landings (metric tons) and number of U.S. purse seiners fishing in the western Pacific Ocean. Data for 1993 are preliminary.

YEAR	VESSELS	YELLOWFIN	SKIPJACK	BIGEYE	TOTAL
1976	3	200	500	-	700
1977	1	200	700	-	900
1978	2	200	800	-	1,000
1979	8	600	8,000	20	8,620
1980	14	1,100	9,900	-	11,000
1981	14	13,000	17,400	170	30,570
1982	24	22,000	37,900	-	59,900
1983	62	49,600	104,100	-	153,700
1984	61	45,100	124,300	60	169,460
1985	40	29,000	87,700	-	116,700
1986	36	36,600	93,500	-	130,100
1987	35	66,400	79,800	-	146,200
1988	32	25,200	99,400	-	124,600
1989	34	41,600	91,100	-	132,700
1990	41	57,100	107,400	-	164,500
1991	42	35,000	171,400	-	206,400
1992	46	50,000	158,000	-	208,000
1993	42	44,200	139,100	-	183,300

Note: Landings in each calendar year may contain some catches from the previous year.

Table 2. Yellowfin tuna landings (metric tons) from U.S. commercial and artisanal fisheries in the central and western Pacific.

YEAR	HAWAII					AMERICAN SAMOA	NORTHERN MARIANAS	GUAM
	TOTAL	LL	BB	TROLL	HL			
1954	240	-	-	-	-	-	-	-
1955	200	-	-	-	-	-	-	-
1956	140	-	-	-	-	-	-	-
1957	170	-	-	-	-	-	-	-
1958	180	-	-	-	-	-	-	-
1959	256	175	60	14	7	-	-	-
1960	161	137	5	14	5	-	-	-
1961	209	152	26	28	3	-	-	-
1962	180	110	48	20	2	-	-	-
1963	175	118	29	18	10	-	-	-
1964	226	133	58	27	8	-	-	-
1965	226	153	44	23	6	-	-	-
1966	228	159	22	35	12	-	-	-
1967	228	141	36	38	13	-	-	-
1968	188	99	46	35	8	-	-	-
1969	191	106	38	31	16	-	-	-
1970	320	251	18	24	27	-	-	-
1971	388	191	22	28	147	-	-	-
1972	357	143	25	43	146	-	-	-
1973	340	88	14	66	172	-	-	-
1974	519	126	23	126	244	-	-	-
1975	761	84	25	333	319	-	-	-
1976	839	111	43	315	370	-	-	-
1977	932	176	21	280	455	-	-	-
1978	932	172	62	328	370	-	-	-
1979	1,130	233	49	365	483	-	2	13
1980	1,627	495	91	360	681	-	0.4	22
1981	1,835	614	89	285	847	-	3	49
1982	1,189	397	106	188	498	3	4	62
1983	1,407	556	55	223	573	9	8	30
1984	1,451	607	54	246	544	27	7	32
1985	1,538	466	103	388	581	17	4	56
1986	2,162	479	114	595	974	24	6	21
1987	2,012	272	78	829	833	13	4	19
1988	1,740	590	76	355	719	23	6	35
1989	1,866	998	10	251	607	25	4	16
1990	1,946	998	17	500	431	11	4	31
1991	1,682	726	20	295	641	15	5	22
1992	1,361	349	16	297	699	11	9	69
1993	1,770	680	4	271	815	4	5	35

Table 3. Catches of yellowfin tuna by western Pacific yellowfin tuna (WPYF) areas for the U.S. purse seine fishery in the central and western Pacific.

YEAR	WPYF AREAS			
	3	4	5	6
1988	535	10,667	45	0
1989	1,389	45,632	0	68
1990	0	36,716	21,260	0
1991	4,687	35,557	691	0
1992	0	37,579	10,163	0
1993	0	45,497	2,256	0

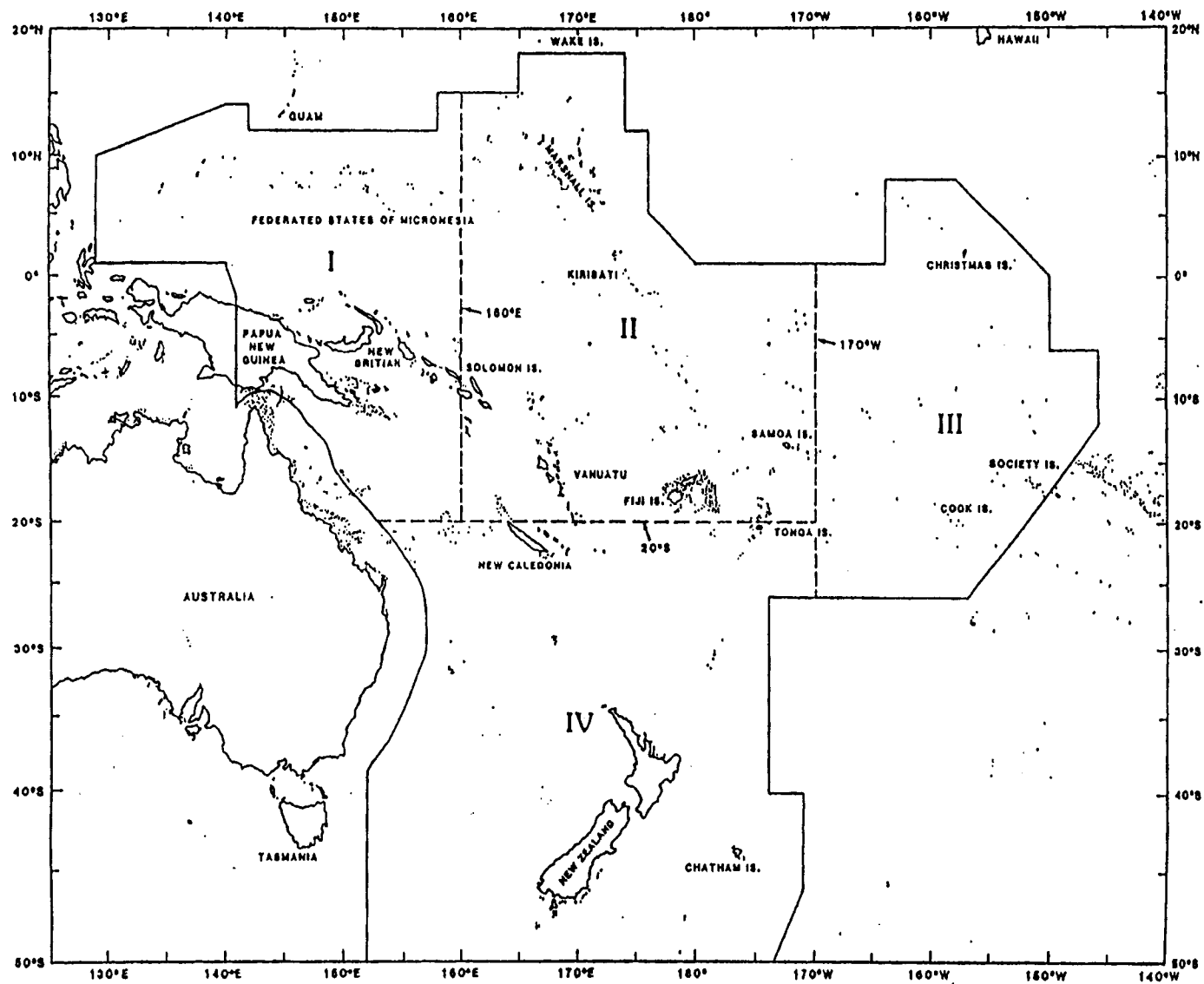


Figure 1. Statistical areas used to sample tuna landings from U.S. distant water purse seiners fishing in the South Pacific Regional Tuna Treaty Area.

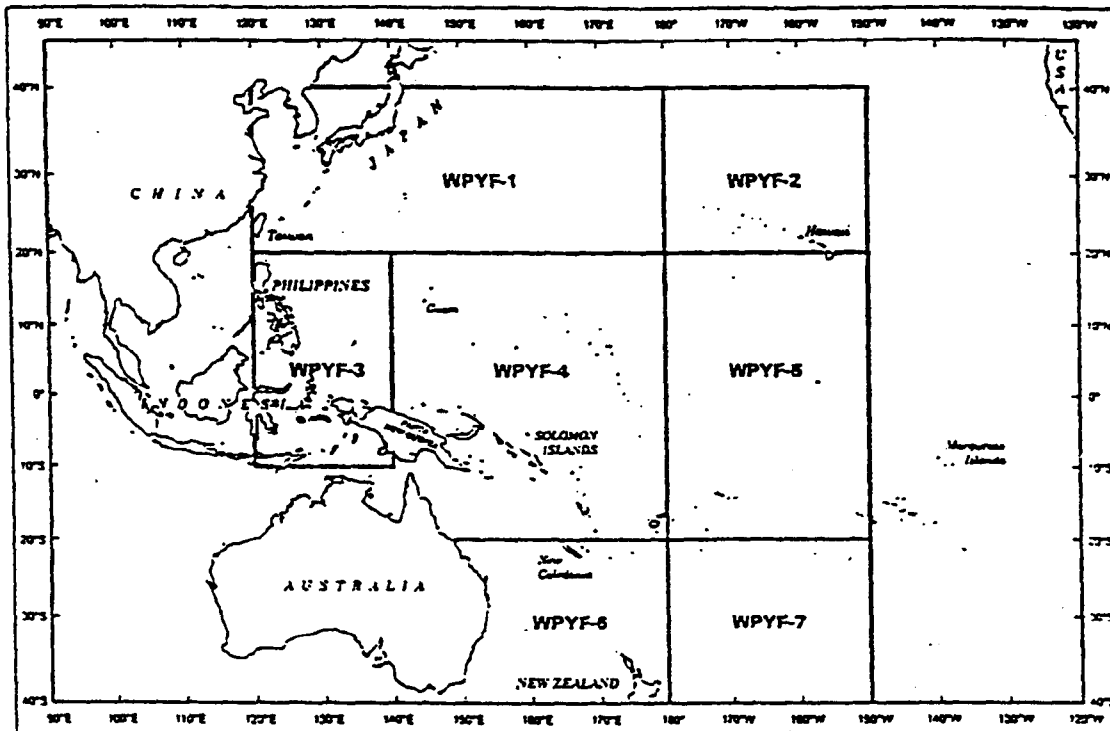


Figure 2. Western Pacific yellowfin tuna (WPYF) study areas used to report yellowfin tuna statistics from fisheries in the central and western Pacific.

WESTERN PACIFIC U.S. PURSE SEINE

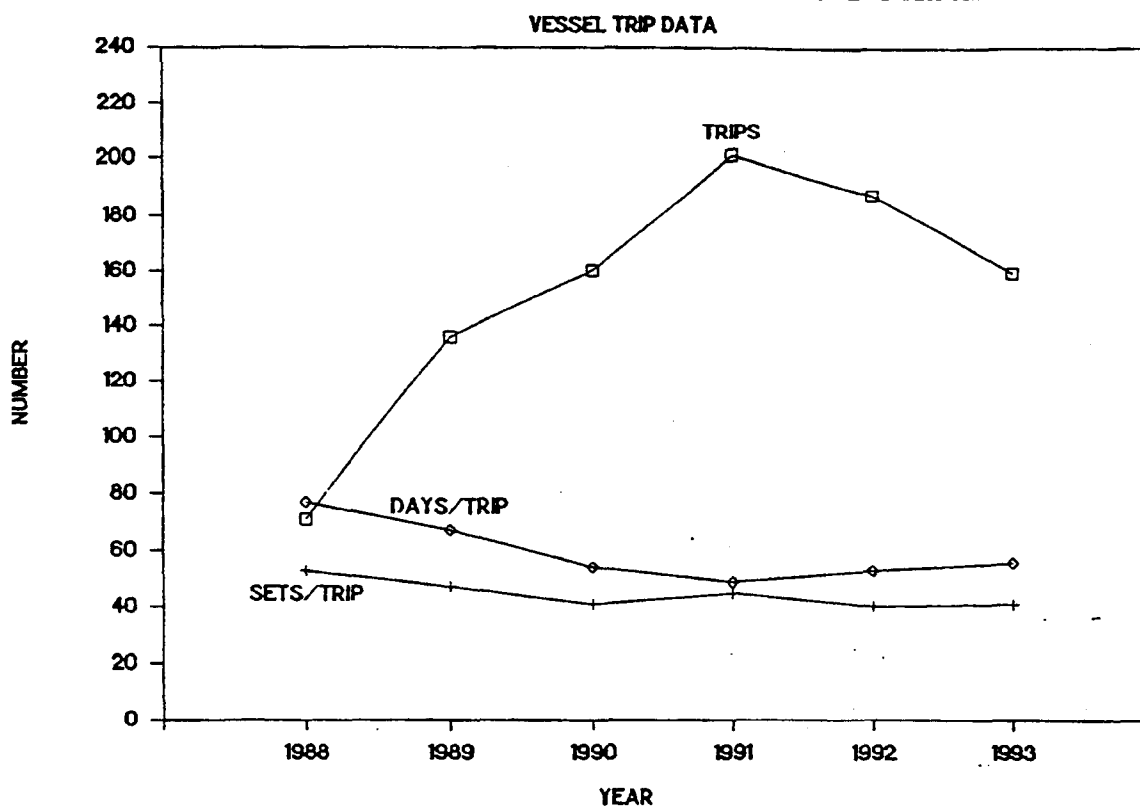


Figure 3. Number of trips, days spent at-sea per trip and number of sets made per trip by U.S. distant-water tuna purse seiners fishing in the central and western Pacific.

U.S. DISTANT-WATER PURSE SEINE FISHERY

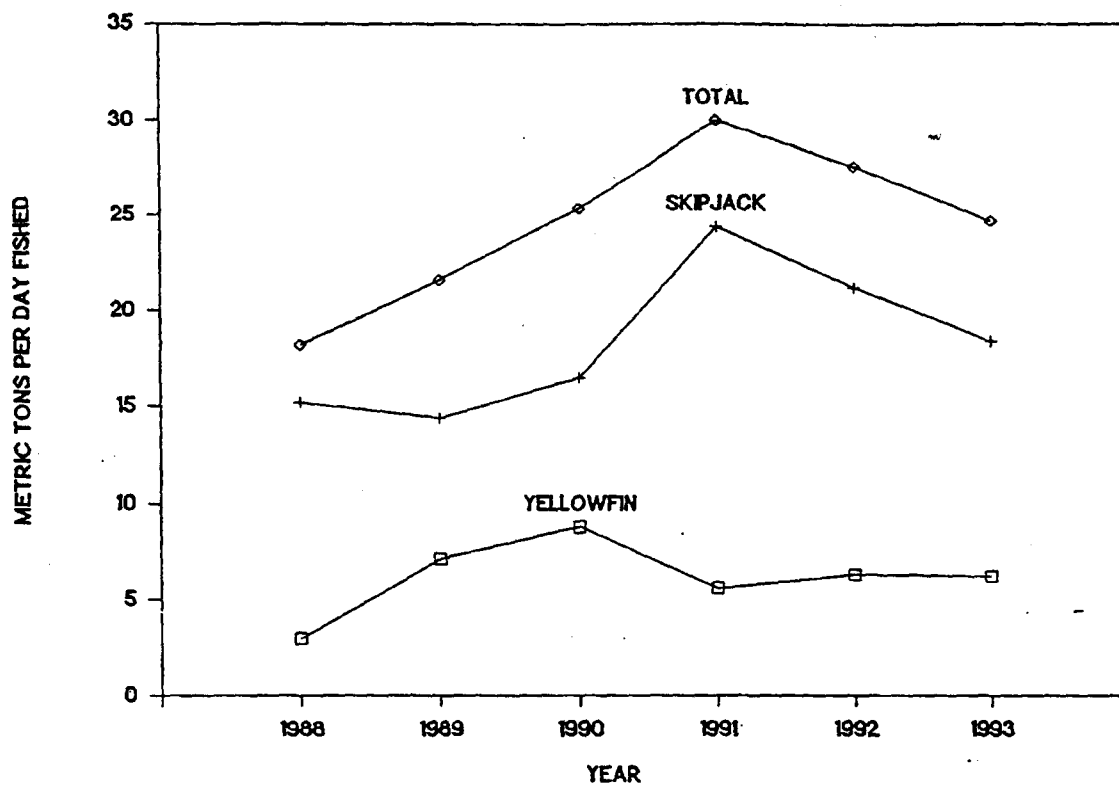


Figure 4. Catch rates for yellowfin and skipjack tunas caught by the U.S. distant-water tuna purse seine fishery in the central and western Pacific.

U.S. DISTANT-WATER PURSE SEINE FISHERY

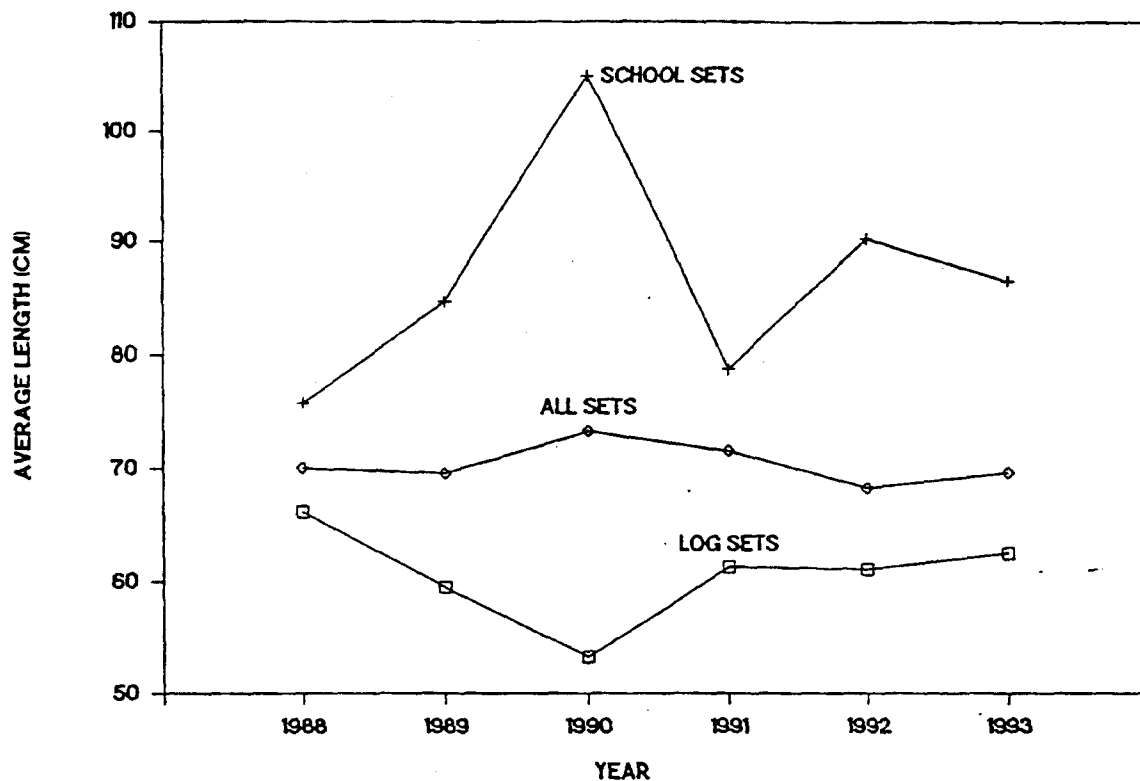


Figure 5. Average sizes (fork length) of yellowfin tuna caught by the U.S. distant-water tuna purse seine fishery in the central and western Pacific. Log sets are sets associated with floating objects; school sets are free-swimming, unassociated schools; all sets include log, school and other sets that are a combination of both or not specified.

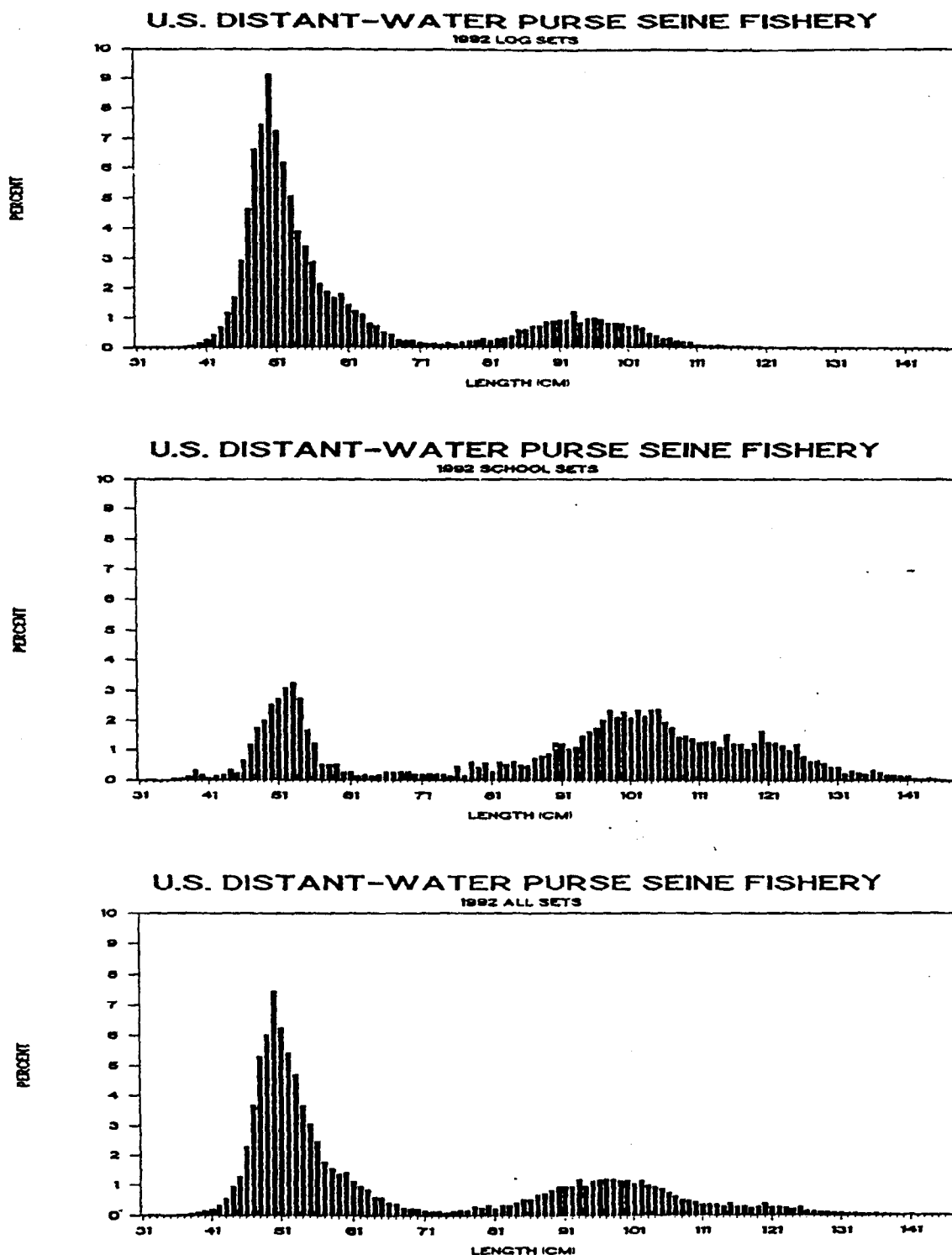


Figure 6. Length-frequency distributions (fork length) of yellowfin tuna caught by the U.S. distant-water tuna purse seine fishery in the central and western Pacific in 1992. Log sets are sets associated with floating objects; school sets are free-swimming, unassociated schools; all sets combine log, school and other sets that are a combination of both or not specified.

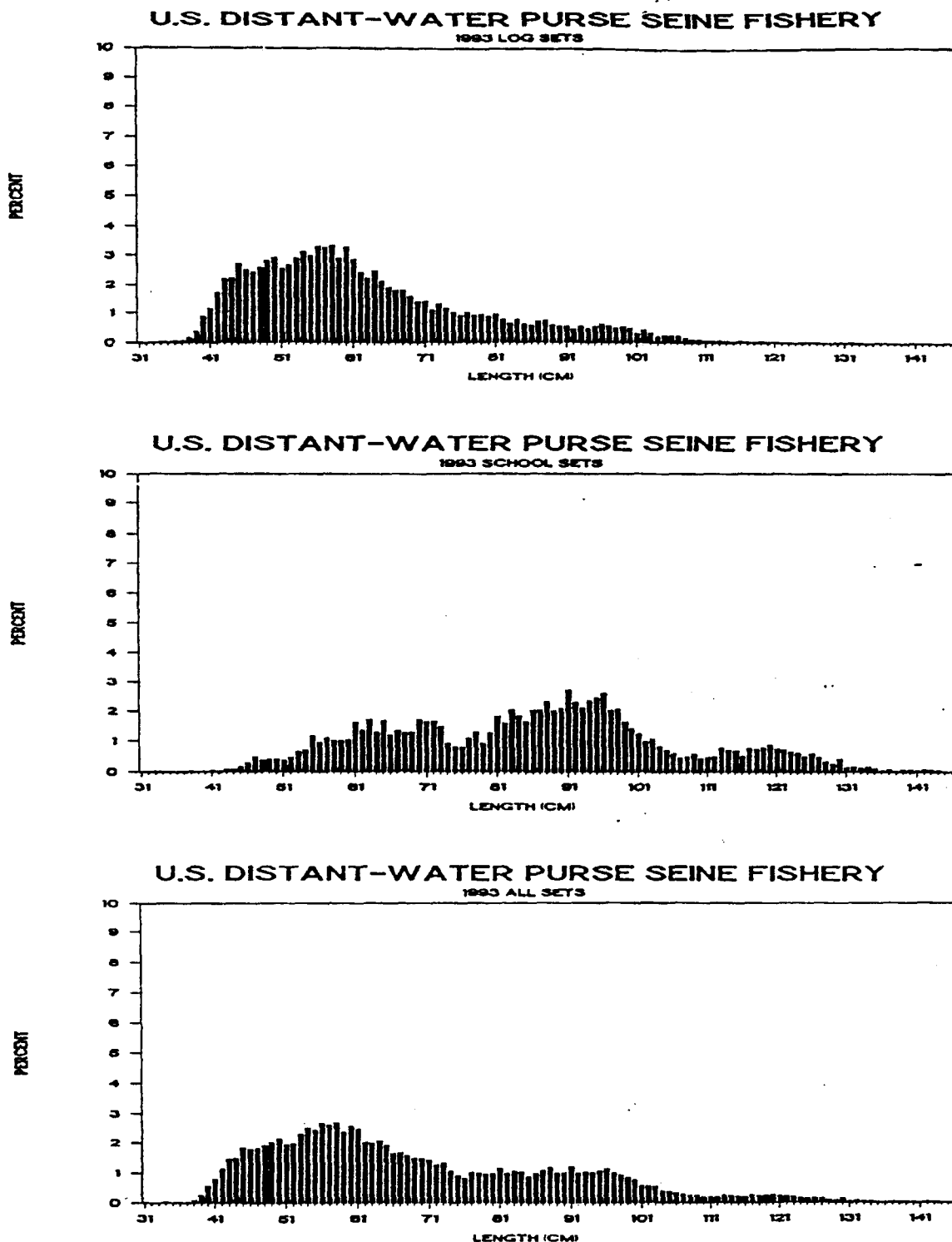


Figure 7. Length-frequency distributions (fork length) of yellowfin tuna caught by the U.S. distant-water tuna purse seine fishery in the central and western Pacific in 1993. Log sets are sets associated with floating objects; school sets are free-swimming, unassociated schools; all sets combine log, school and other sets that are a combination of both or not specified.

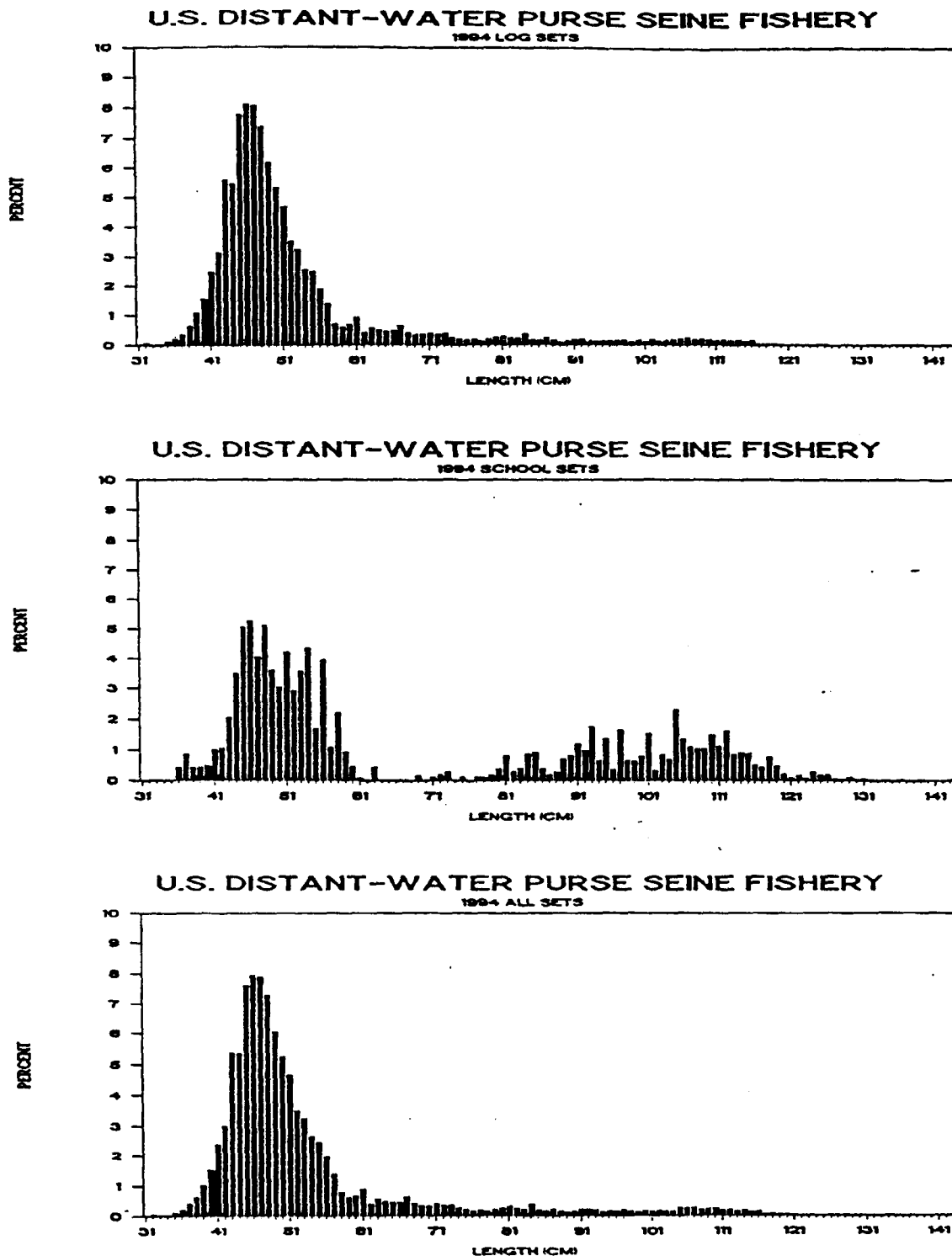


Figure 8. Length-frequency distributions (fork length) of yellowfin tuna caught by the U.S. distant-water tuna purse seine fishery in the central and western Pacific in 1994. Log sets are sets associated with floating objects; school sets are free-swimming, unassociated schools; all sets combine log, school and other sets that are a combination of both or not specified. Data are preliminary and only represent January to March catches.