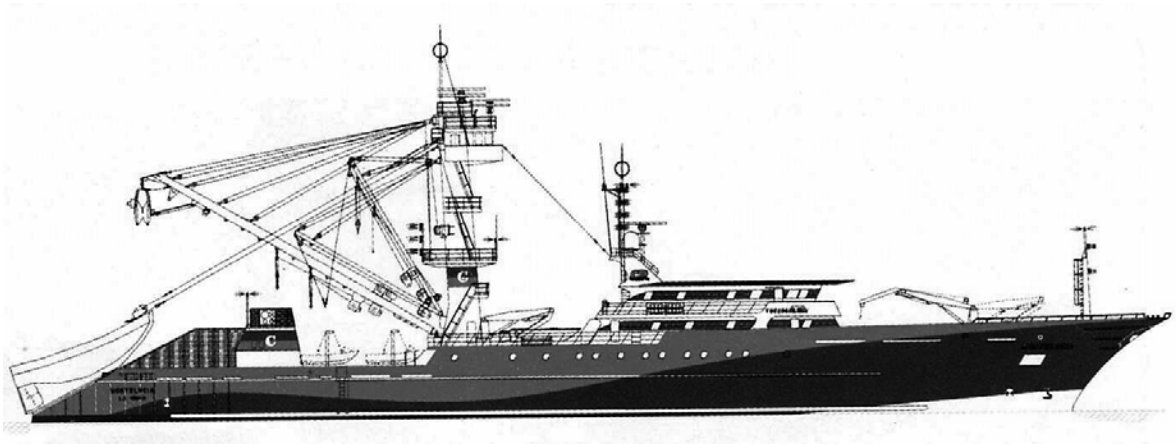
SCTB15 Working Paper

FTWG–1

The 2001 U.S. purse seine fishery for tropical tunas in the central-western Pacific



Atilio L. Coan Jr., Gary T. Sakagawa[1]

and

Gordon Yamasaki[2]

[1] National Marine Fisheries Service, Southwest Fisheries Science Center, La Jolla, California, U.S.A.

[2] National Marine Fishery Service, Southwest Regional Office, Pago Pago, American Samoa, U.S.A.

The 2001 U.S. purse seine fishery for tropical tunas in the central-western Pacific[3]

Atilio L. Coan Jr., Gary T. Sakagawa

National Marine Fisheries Service
Southwest Fisheries Science Center
La Jolla, California, U.S.A.

and

Gordon Yamasaki

National Marine Fishery Service
Southwest Regional Office
Pago Pago, American Samoa, U.S.A.

INTRODUCTION

The South Pacific Regional Tuna Treaty between the United States and 16 Pacific Island nations provides U.S. purse seine fishermen with access to the rich tuna fishing areas of the central-western Pacific. This Treaty came into force in 1988, was extended in 1993 for 10 years, expires in June 2003, and is expected to be extended for an additional 10 years. A key provision of this Treaty is timely reporting of fishery statistics, including landings, catch and effort, and size and species composition by the United States. Statistics are collected by the National Marine Fisheries Service (NMFS) from fishermen, canneries and through direct sampling of landings at the primary landing port, Pago Pago, American Samoa. The statistics are processed, transmitted to the Forum Fisheries Agency (FFA) and archived by the Southwest Fisheries Science Center, NMFS. The FFA through an at-sea observer program that targets 20% of vessel trips collects additional data on the U.S. fleet's operations.

Data collected by NMFS and the FFA from the 2001 fishery are summarized in this report. The format of presentation is similar to that used in previous reports on U.S. purse seine fisheries in the central-western Pacific Ocean and is based on the calendar year. The Oceanic Fisheries Program, Secretariat of the Pacific Community, provided data from the at-sea observer program.

FLEET PERFORMANCE

Depressed ex-vessel prices for tuna in 2000 continued into early 2001 (Figure 1). A large portion of the U.S. fleet remained in port in December 2000 and January 2001 as prices paid by the canneries in American Samoa remained at $400/short ton. In late February, ex-vessel prices inched upward and vessels gradually set sail for their first trip of the 2001, fishing season. By the end of May, thirty-one of the 35 licensed vessels were fishing in the Treaty area (Table 1).

[3] Report prepared for the 15th Standing Committee on Tunas and Billfishes, Fishing Technology Working Group, July 18-27, 2002, Honolulu, Hawaii.

However, unloading delays in Pago Pago affected the fleet's ability to take full advantage of the higher prices and good fishing conditions. Vessels not on preference lists maintained by the canneries, waited upwards of 21 days for berthing to unload. Vessels unwilling to wait traveled to other ports, such as in Southeast Asia.

The fleet spent 4,931 days fishing in 2001, slightly more than in 2000 (4,320 days), and with two fewer vessels. Fishing was over a wide area between the 10°N and 10ES, and primarily between Kiribati (Gilbert Is.) and Tuvalu (Figure 2). Less effort was spent in western areas around Papua New Guinea whereas more effort was spent to the north around the Marshall Islands than in 2000.

In 2001, the fleet's fishing effort was almost equally divided between sets on free-swimming schools and sets on logs and Fish Aggregating Devices (FADs, Figure 3). In contrast, 33% of the fleet's sets were on free-swimming schools and 67% on logs and FADs in 2000. Sets per trip increased by 6% and days-at-sea per trip decreased by 7% respectively in 2001 over 2000 rates (Table 2). Overall catch rate (24 t/day fished) in 2001 was approximately 11% lower than in 2000 (27 t/day fished).

CATCHES

The total catch for the 2001 season of 115,524 t is 11% less than the 2000 reported catch, and represents the lowest catch reported since 1989 (Table 1). The catch of skipjack tuna increased a modest 6%, and the catches of yellowfin tuna and bigeye tuna decreased significantly by 27% and 48% respectively from catches in 2000. The 2001 record low total catch is primarily caused by the late start of the fishing season. However, the decrease in the fleet size by two vessels in 2001 and the unloading delays at the canneries are probably secondary causes for the low catch.

The bulk (93%) of the 2001 catch was unloaded at canneries in American Samoa, an increase from 85% in 2000. The remainder was unloaded to canneries or for processing in Bangkok, Thailand (3.2%); Levuka, Fiji (1.4%); Pohnpei, Federated States of Micronesia (1.4%); and Majuro, Marshall Islands (1.0%).

Size Composition

Port samplers in American Samoa measured 23,035 yellowfin tuna, 12,968 bigeye tuna, and 25,860 skipjack tuna for fork length (FL). Yellowfin tuna averaged 75 cm FL, bigeye tuna, 56 cm FL and skipjack tuna, 54 cm FL in the 2001 landings (Figure 4). Yellowfin and bigeye tunas caught in 2001 tended to be larger than those caught in 2000. There was no significant change in the skipjack tuna average size.

FFA observers also collected size composition samples on 28 trips in 2001. The samples represent 10,311 yellowfin tuna, 3,776 bigeye tuna and 36,907 skipjack tuna. The average sizes were 80 cm FL for yellowfin tuna, 59 cm FL for bigeye tuna and 56 cm FL for skipjack tuna (Figure 4). These averages are all greater than measurements collected by NMFS port samplers

in American Samoa, which indicates that FFA observers measured more large fish than port samplers. Otherwise, the sampling results of both fisheries were quite similar.

Species Composition

In 2001, approximately 62,000 fish were examined for species composition of which 26,000 fish came from mixed species landings. The results were very similar to findings of past seasons. That is, the percentage of bigeye tuna occurring in yellowfin tuna landings, i.e., mislabeled, is highest when small fish (<9 kg or 78 cm FL) are involved in log and FAD sets (51%) and lowest when large fish (>9 kg or 78 cm FL) are involved in free-swimming school sets (<1%). The average was 22% bigeye tuna in landings labeled as yellowfin tuna. For skipjack tuna landings, the results indicate a small amount of mislabeling. Approximately 2% of yellowfin tuna and 1% of bigeye tuna was found mixed in skipjack tuna landings. These results were used to obtain corrected landing statistics (Table 1).

By-catch and discards

Logbook and FFA observer records were used to compile information on tuna discards and by-catch species in 2001 (Table 3). Significant differences continue to be found between these two sources of data. For instance, total discards of tuna at sea from logbook reports (100% coverage amounted to 1,770 t and observers onboard 24% of the trips reported 2,700 t. Logbooks showed sharks (38%), billfishes (24%), baitfish (22%) and amberjack (9%) as the primary by-catch species caught and largely discarded at sea. In contrast, observers reported rainbow runner (32%), sharks (25%), wahoo (13%) and billfishes (9%) as the primary by-catch species.

Similar differences in by-catch and tuna discards have been observed in past years and are probably due to differences in the priorities of vessel captains and observers. That is, vessel captains are more attentive to the ship's operations and to landing economically important tuna during completion of a set than to accurately recording by-catch and discards in logbooks. Logbook records, therefore, would tend to typically underestimate by-catch and discards. Observers, on the other hand, are trained to be attentive to recording accurate information on the entire catch of each set. Observer records, hence, should generally be a more accurate accounting of the by-catch species and discards of a set.

BROADER CONSIDERATIONS

The U.S. tuna purse seine fleet is one of several that operates in the central-western Pacific Ocean and since 1991, has accounted for a decreasing share of the total catch from the region. Most recent complete statistics for all fleets are for 2000. The statistics indicate that the U.S. purse seine catch that year represented about 12% of the total catch of tropical tunas landed by all purse seiners in the central-western Pacific Ocean and 7%, landed by all gears in the region. In contrast, the U.S. catch in 1991, represented 22% of the total catch of tropical tunas landed by all purse seiners.

Despite its decreasing share, the fundamental requirements for long-term sustainability of the U.S. fishery continue to be a healthy resource and dependable markets. Recent indicators of resource health and markets suggest increased uncertainty in these fundamental requirements for a sustainable fishery. The collapse of ex-vessel price in 2000 and 2001 demonstrated that the tuna market is sensitive to excessive global production and more than sufficient fishing capacity is available to meet those production demands. The SCTB in 2001 sensed some weakness in stock condition and recommended caution in further increases of fishing mortality on yellowfin tuna and bigeye tuna in the central-western Pacific region. Finally, fishing capacity and production in the region appear to be on the upswing, which will contribute to increased fishing pressure and competition.

Table 1. Catch[1] and number of U.S. tuna purse seiners fishing in the central-western Pacific Ocean.

Year	Central-Western				
	No. of Seiners	Catch (t)			
		Skipjack	Yellowfin	Bigeye	Total
1988	31	93,636	18,832	1,948 [2]	114,416
1989	35	95,027	42,886	2,421	140,334
1990	43	110,044	52,089	1,762	163,895
1991	43	177,389	37,330	1,550	216,269
1992	44	155,898	43,693	3,480	203,071
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	39	120,127	19,417	9,860	149,404
1997	35	79,386	54,638	10,058	144,082
1998	39	131,573	37,530	5,525	174,628
1999	36	129,262	35,820	17,403	182,485
2000	33	80,272	32,126	12,953	125,351
2001	31	85,436	23,430	6,658	115,524

[1] Catches include discards.
[2] Estimate based on only 6 months (June to December 1988) of species composition data.

Table 2. Fleet performance statistics for U.S. tuna purse seiners fishing in the central-western Pacific Ocean.

Year	Vessels			Days/ Trip[3]	Sets/Trip	Trips/ Vessel	Capacity[4]/ Vessel (mt)	Catch-Per-Unit Effort (t/day fished)		
	Licensed[1]	Fished[1]	Trips[2]					Yellowfin[5]	Skipjack	Total
1988	35	31	71	69.42	46.07	2.29	1,164	3.01	15.37	18.38
1989	35	35	154	58.07	41.88	4.40	1,148	7.26	14.59	21.85
1990	51	43	181	47.32	34.79	4.21	1,131	8.91	16.66	25.57
1991	48	43	229	42.38	40.40	5.33	1,139	5.70	24.78	30.48
1992	44	44	212	46.32	35.11	4.82	1,144	6.39	21.48	27.87
1993	42	42	199	51.92	37.27	4.74	1,144	6.46	18.29	24.75
1994	48	49	241	44.11	35.21	4.88	1,142	7.63	18.61	26.24
1995	47	44	206	49.14	33.38	4.68	1,138	4.68	17.39	22.07
1996	40	39	182	50.09	33.02	4.67	1,122	4.13	16.93	21.06
1997	35	35	177	58.05	35.60	5.06	1,129	8.45	12.06	20.51
1998	39	39	200	46.49	27.48	5.13	1,167	6.74	21.64	28.38
1999	38	36	176	42.35	20.73	4.89	1,184	7.34	26.77	34.11
2000	36	33	120	56.48	32.03	3.64	1,249	6.28	21.01	27.29
2001	35	31	117	51.62	34.39	3.69	1,401	5.51	18.01	23.52

[1] The number of vessels that fished during the calendar year may be different from number based on licensed year; June 15 of one year to June 14 of the next year.
[2] Includes all trips that started or ended in the calendar year. Trips that overlap years and have sets in each year are counted in in both years.

[3] Days are days at-sea.
[4] Average carrying capacity of vessels that fished in the calendar year.
[5] Includes bigeye tuna catch.

Table 3. Reported tuna discards and catch of by-catch species from logbooks and observers for the U.S. purse seine fishery for tunas in the central-western Pacific in 2001.[3]

Species	Logbook reports Metric tons	Observer reports Metric tons[1,2]
Tuna discards		
Skipjack tuna	1,728.35	2301.82
Yellowfin/bigeye tuna	40.46	412.38
By-catch		
Billfish:	**16.23**	**14.72**
Black marlin	0.69	9.84
Blue marlin	0.30	3.96
Marlin unspecified	15.20	-
Sailfish	0.04	0.50
Short-billed spearfish	-	0.14
Striped marlin	-	0.28
Sharks:	**25.35**	**42.95**
Basking Shark	0.91	-
Bule shark	-	0.02
Hammerhead shark	-	0.15
Mako shark	-	0.24
Oceanic white-tip shark	-	5.59
Shark Unspecified	24.44	9.77
Silky shark	-	23.85
Silver-tip shark	-	0.53
Whale shark	-	2.80
Other tunas/Tuna-like:	**0.20**	**23.23**
Albacore	-	0.07
Bullet tuna	-	0.01
Frigate/bullet tuna	-	0.02
Frigate tuna	-	0.01
Kawakawa	-	0.28
Wahoo	0.20	22.84
Other:	**24.49**	**91.44**
Amberjack	6.21	1.34
Baitfish	14.70	-
Barracuda	0.02	5.44
Filefishes	-	0.08
Mackerel	0.25	0.04
Mackerel scad	-	0.13
Mahimahi	0.10	13.41
Manta Ray	0.36	4.38
Milkfish	-	0.02
Moonfish	-	0.00
Triggerfish	-	0.50
Pelagic sting ray	-	0.00
Pomfrets/breams	-	0.01
Rainbow Runner	0.07	54.62
Squid	-	0.00
Trevallies	-	0.10
Other unspecified	2.79	6.44
Turtle unspecified	-	0.01
Marine mammal unspecified	-	1.92
Whale unspecified	-	3.00

1/ Data are preliminary and represent 20% observer coverage.
2/ 0.00 values in the table indicate by-catch <0.01 t.

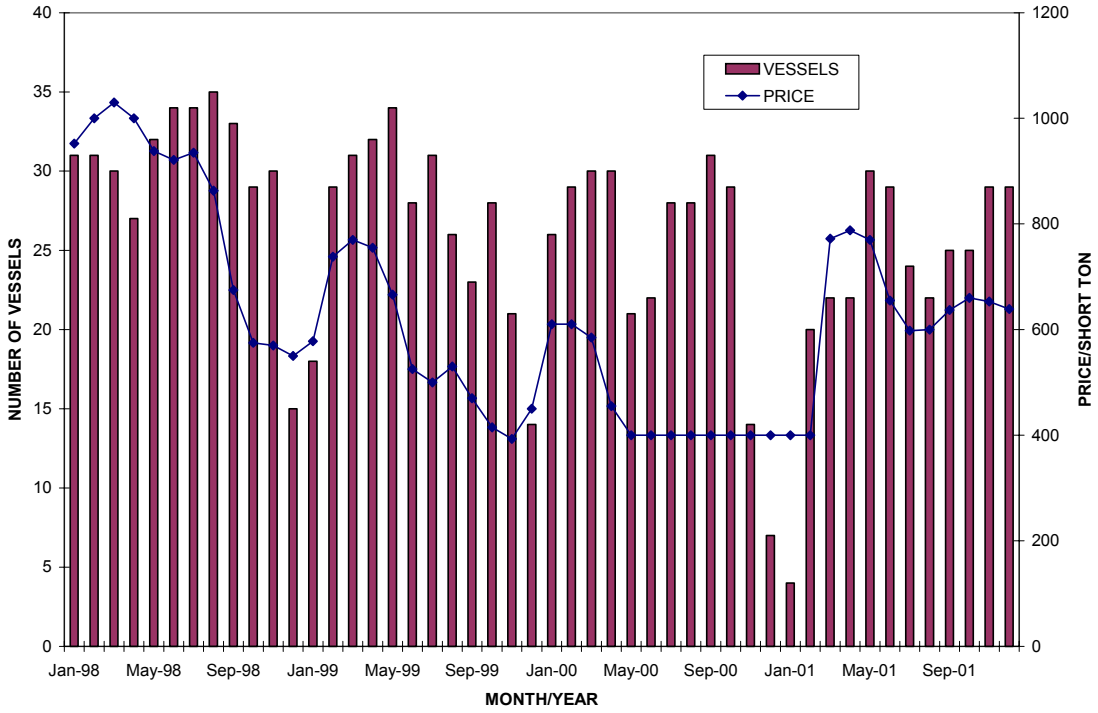


Figure 1: Monthly distribution of the number of U.S. purse seiners fishing in the central-western Pacific and price for tunas, 4 to 7.5 pounds, in American Samoa. (Price data from Paul Krampe, pers. comm.).

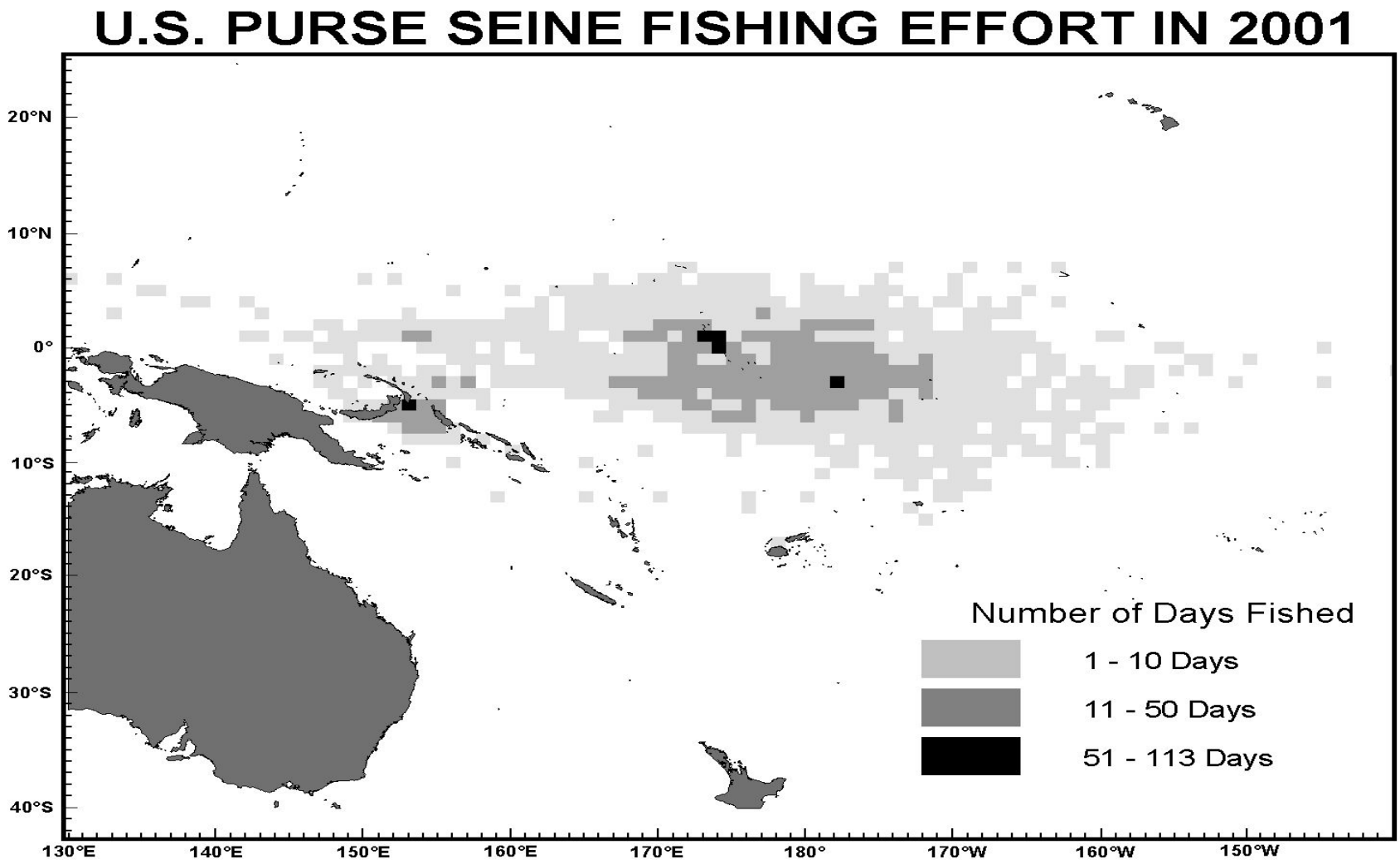


Figure 2. Distribution of fishing effort (days fished) for the 2001 U.S. tuna purse seine fishery in the central-western Pacific Ocean.

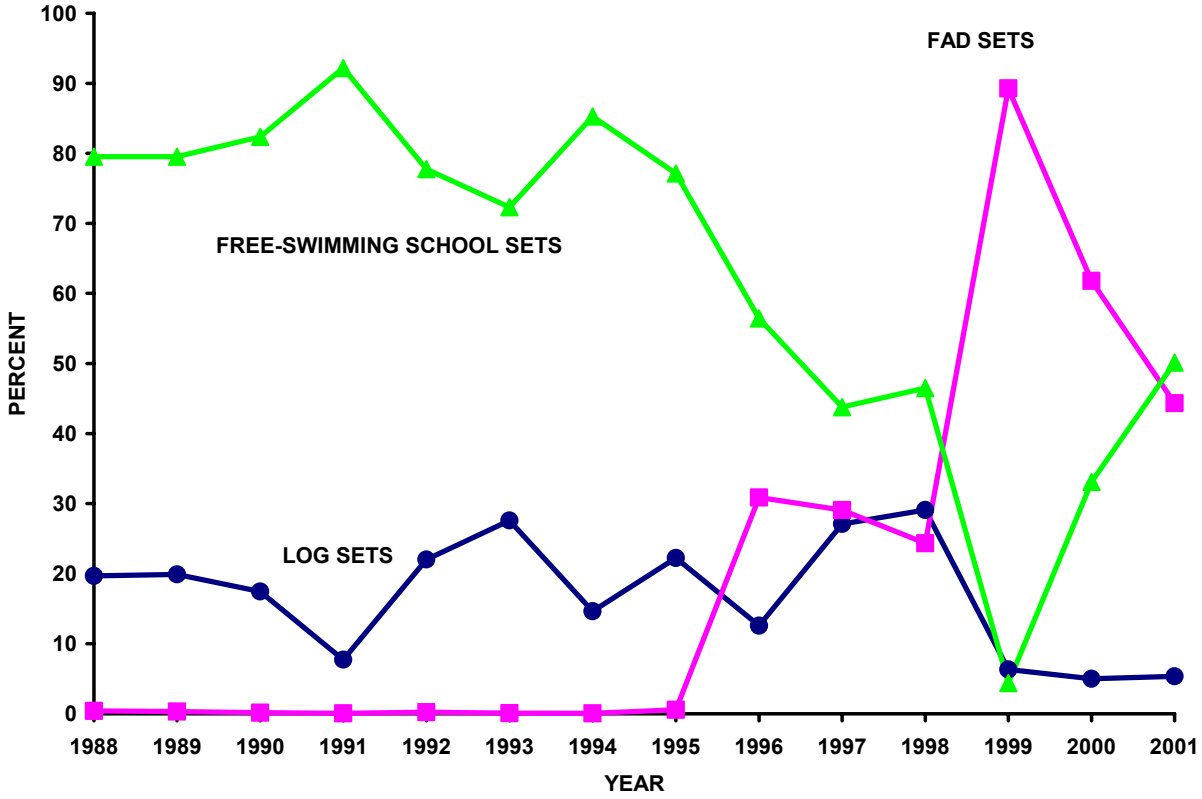


Figure 3. Percentage of sets by set type (free-swimming school, log and Fish Aggregation Device (FAD)) for U.S. purse seiners fishing in the central-western Pacific Ocean.

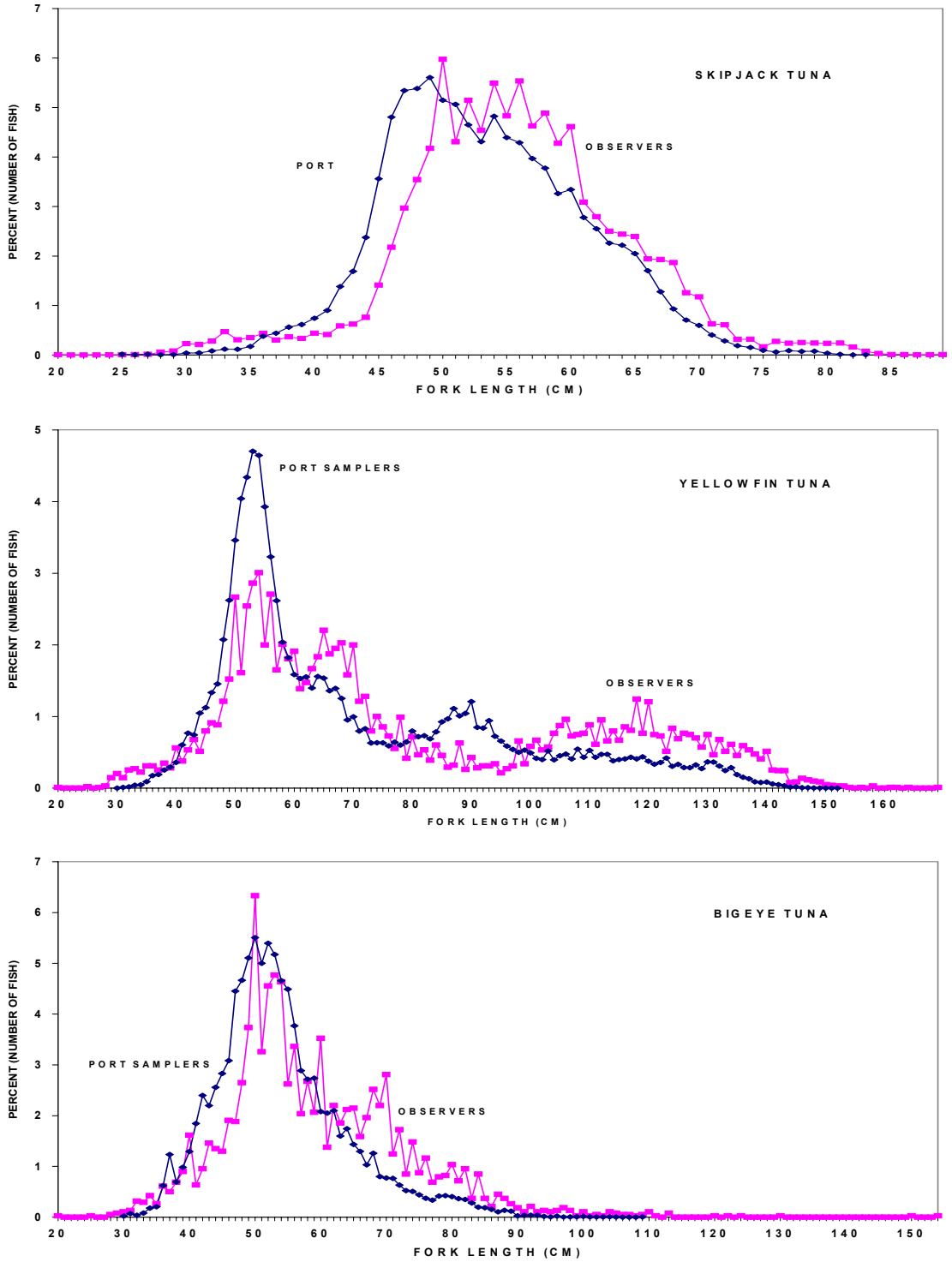


Figure 4. Size frequencies of skipjack, yellowfin and bigeye tunas caught by U.S. purse seiners in the central-western Pacific in 2001. Measurements were taken by port samplers and observers.