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REPORT OF THE SWFSC RESEARCH ACTIVITIES FOR SOUTH PACIFIC ALBACORE DURING 1991–92 AND PLANS FOR 1993

presented by

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The National Marine Fisheries Service (NMFS) is the U.S. agency responsible for monitoring U.S. fisheries and for conducting research on living marine resources in support of conservation and wise use. The agency has assigned the Southwest Fisheries Science Center (SWFSC) the lead role for research and monitoring of the south Pacific albacore fishery. Described in this paper is a summary of activities performed by SWFSC in 1991 and 1992 in fulfilling its responsibility for south Pacific albacore, and plans for 1993 activities.

FISHERIES MONITORING

In 1991 and 1992, fisheries monitoring was performed through a combination of regular contacts with SPAR scientists, industry representatives, vessel captains and vessel owners, by port sampling of catches and by collection of fishing logbooks.

Logbooks were collected from fishing fleets as was done in past years. Participation by fishermen continued to be strictly voluntary because the U.S. has no regulations requiring mandatory catch and effort reporting by albacore fishing vessels. Nonetheless, SWFSC received good cooperation from the fishermen and industry representatives. Permission to release aggregated data after the fishing season, while protecting confidentiality concerns was also obtained.

Coverage rate for the U.S. troll fishery was high, although with a decreasing trend of 74% of the trips in 1989-90, 60% in 1990-91 and 56% in 1991-92 (Table 1). This decreasing trend is largely due to increased transshipment of catches at sea from the fishing area to cannery facilities. For example, in 1991-92, 64% of the catch was involved in at-sea transshipments. With transshipments, access to trip logbooks is reduced.

For the foreign longline fishery, NMFS collected logbooks for only that part of the fleet based in American Samoa (Korean Taiwan and others registered vessels). The coverage rate for vessels targeting albacore for the canneries in American Samoa was 25% in 1991 and 26% in 1992.

Port sampling of landings was conducted at landing ports by NMFS personnel and by scientists with cooperating foreign agencies. Sampling in Pago Pago, American Samoa and

in Honolulu, Hawaii was performed by NMFS personnel. In Papeete, French Polynesia, Establissement Pour la Valorisation des Activites Aquacoles et Maritimes (EVAAM) was the cooperating agency. In Levuka, Fiji, personnel with the Fisheries Division were involved. At each port, the sampling strategy was to collect length-frequency measures from a representative sample of the albacore landed as well as information on date and location of the sampled catch. Coverage for the U.S. troll catch was: 80% in 1989-90, 63% in 1990-1991, and 55% in 1991-1992 (Table 1). Sampling coverage for the longline catch, which was sampled only in Pago Pago, was 90% in both 1991 and 1992.

Results of SWFSC monitoring efforts for the 1989-1990 and 1990-91 seasons were reported in various reports to SPAR, e.g., working papers 12 and 13 of SPAR4 and in a working paper submitted to SPAR5. Results for the 1991-92 fisheries are in preparation for release; a summary is as follows:

1991-92 U.S. TROLL FISHERY

The 1991-92 U.S. south Pacific albacore fishery started in mid-December 1991 and continued through the end of April 1992. Fifty-five vessels participated in the fishery fishing an estimated 4,100 days. This represented a 5% decline in number of vessels and a 9% decline in days fished for the fleet as compared to the previous season.

The U.S. troll fleet caught albacore over a broad area, 33° -48° S latitude and 178° E-98° W longitude, during the fishing season (Figure 1). Catches were highest in January, roughly 1,000 miles south of French Polynesia. Total landing for the season was 3,016 mt, 46% less than the 5,540 mt landed in 1990-91.

The catch rate for the 1991-92 season was also down, 132 fish/day (1.1 mt/day) versus 197 fish/day (1.7 mt/day) recorded in 1990-91 (Figure 2). The highest catch rates averaged 267 fish/day (1.7 mt/day) and were made in January approximately 1,000 miles south of French Polynesia. Catch rates in the central part of the fishery (35-45° S and 135-165° W) averaged 143 fish/day (1.1 mt/day) as compared to 250 fish/day (1.9 mt/day) in 1990-91.

The average size of fish caught decreased from 7.53 kg (16.6 lbs) in 1990-91 to 6.71 kg (14.8 lbs) in 1991-92. Fish ranged in size from 41 to 102 cm with modes at approximately 62 and 72 cm (Figure 3). The majority of albacore landed by U.S. troll vessels were estimated to be 3 and 4 year-old fish.

1991-92 NON-U.S. LONGLINE FISHERY

The south Pacific longline fishery for albacore largely began in 1954 with the opening of a tuna cannery in Pago Pago by a California interest. Foreign registered longliners were recruited to supply the cannery with fish and be based in Pago Pago. This arrangement has continued, with Japanese registry dominant during the early years, and Korean and Taiwan registries since the 1960s. The longline vessels also underwent changes over time; increasing in tonnage or fishing capacity and increasing in sophistication with modern, electronic fishing and navigational equipment.

Monitoring of the fishery began in 1963 by the predecessor agency of NMFS and continued uninterrupted to this day. Results of the monitoring up to 1990 have been reported in publications of the SWFSC. Results for recent years (1990s) are being processed for release. Preliminary results indicate fluctuation in catches, within the range of 13,000 to 19,000 mt, and a high percentage of the catch of albacore from the south Pacific continued to be landed by the Pago Pago based fleet (Table 2). Fewer vessels are engaged in the fishery than in the 1970's and early 1980s. In 1991 and 1992, 98 and 86 longliners respectively landed albacore at Pago Pago. Their total catch was 14,900 mt in 1991 and is estimated to be 17,500 mt for 1992.

RESEARCH

The SWFSC research efforts in 1991 and 1992 were concentrated in two major areas: reprocessing longline data, and completing a study on reproductive biology. Progress was made in both areas.

Logbook catch and effort data, landings statistics, and catch size composition data have been collected from longliners landing in Pago Pago since 1963. Other catch and effort statistics are available from government fishery agencies of Japan, Korea, and Taiwan. The data are stored in several types of flat files not readily accessible for efficient analysis of stock trends or fishery interactions. The SWFSC will embark on a project to correct these problems over the next few years. The process involves updating data files, inspection and cross-referencing of original data records, comparison of data from different sources, and development of a comprehensive relational database.

The reproductive biology study was conducted in cooperation with SPC and was concluded in 1992. Results of the study are reported in a working paper presented at this SPAR meeting. The major conclusion of the study is that adult albacore, caught in the mid to low latitudes of the south Pacific, i.e., around New Caledonia and Tonga, have a reproductive cycle of spawning in the austral summer and a resting state in the winter. Spawning most likely takes place in the low latitudes of the tropics. Also, spawning in the tropics is year-round, although each fish may not spawn year-round, but migrate out of the region after spawning.

PLANS FOR 1993

NMFS funding of SWFSC activities has not kept up with increased responsibilities and demands on the Center's resources. As a result, funding for south Pacific albacore activities has been affected. For 1993, SWFSC plans to continue routine monitoring of the U.S. troll fishery and the foreign longline fishery based in American Samoa for south Pacific albacore. Logbook collection and port sampling of the landings will proceed as in the past. However, we are anticipating a reduced U.S. fishery and hence, less monitoring effort.

Early reports from vessels participating in the 1992-93 troll fishery indicate poor fishing conditions. Scattered and ill-defined fronts are not concentrating albacore in quantities that

allow efficient harvest by the fleet in the traditional fishing area. If this keeps up, the fishermen will leave for the north Pacific earlier than usual, and in fact, some fishermen are already making plans for a short south Pacific season.

Processing of fishery data will be performed, but with the U.S. fishery data receiving priority. Depending on the volume of U.S. fishery data received, surplus effort will be applied to processing longline fishery data, including the backlog that has accumulated and remains unprocessed since 1991.

A comprehensive re-structuring of the SWFSC's longline data base will be initiated in 1993. The work plan calls for designing a relational database system, rescuing historical data, and eliminating duplicate data. For the later activity, consultation with scientists in Taiwan and Korea is being planned.

For biological and population studies, the SWFSC plans are sketchy. Project proposals to examine interaction between the troll and longline fisheries; to investigate impacts of expanded surface fisheries on stock abundance and condition; to evaluate environmental factors for forecasting fishing conditions; and more will be considered should resources become available later in the year.

ACKNOWLEDGEMENT

The task of monitoring and conducting research on a wide-ranging fishery and species is a challenge when resources are at a premium. SWFSC is addressing the challenge by applying its resources judiciously and by using alternatives, including the SPAR network and fishermen for assistance and data. We acknowledge their contribution, particularly that of the fishermen. We also acknowledge the following individuals for their exceptional contribution during 1990-92: Stephen Yen of EVAAM (French Polynesia); Peniasi Kunatuba and Tim Adams of the Fisheries Division (Fiji); Tony Lewis and Kevin Bailey of the SPC; Gordon Yamasaki of the Southwest Region, NMFS; and William Perkins and Art Hayworth of the American Fishermen Research Foundation (U.S.) and Western Fishboat Owners Association (U.S.).

Table 1. Statistics on monitoring of the U.S. troll fishery for albacore in the south Pacific Ocean.

Season	Vessels (Number)	Catch (mt)	Sample Coverage Rate (%)	
			Logbook[1]	Length Frequency[2]
1986	2	89	100	100
1987	7	751	75	80
1987-1988	35	3,253	26	100
1988-1989	38	3,068	44	68
1989-1990	38	3,898	74	80
1990-1991	58	5,540	60	63
1991-1992	55	3,016	56	55

[1] Logbook coverage is based on the number of sampled vessel trips.

[2] Length-frequency coverage is based on the tonnage landed by vessels that were sampled.

Table 2. Longline albacore catch (metric tons) for the south Pacific, and catch and the number of vessels for longliners unloading in American Samoa.

Year	Catch (mt)			Number of Vessels			
	South Pacific	American Samoa	A.S. % of S.P.	Korea	Taiwan	Other	Total
1973	37,830	30,148	80	172	172	0	344
1974	31,561	14,641	46	171	149	0	320
1975	27,203	7,840	29	135	77	0	212
1976	27,818	14,554	52	119	93	0	212
1977	37,348	18,691	50	132	98	0	230
1978	34,451	19,186	56	136	78	0	214
1979	26,118	14,374	55	139	67	0	206
1980	39,184	16,663	43	174	100	0	274
1981	34,244	19,103	56	154	98	0	252
1982	30,281	16,036	53	105	56	1	162
1983	23,771	14,968	63	65	50	0	115
1984	20,739	10,457	50	48	51	2	101
1985	27,919	13,892	50	57	34	3	94
1986	35,603	20,393	57	52	59	2	113
1987	28,755	21,164	74	35	68	11	114
1988	31,936	20,844	65	30	61	10	101
1989	(24,221)	15,237	(63)	29	64	10	103
1990	(25,764)	10,790	(42)	21	56	9	86
1991	(25,518)	14,873	(58)	17	71	10	98
1992	(25,518)	(17,468)	(68)	(4)	(77)	(5)	(86)

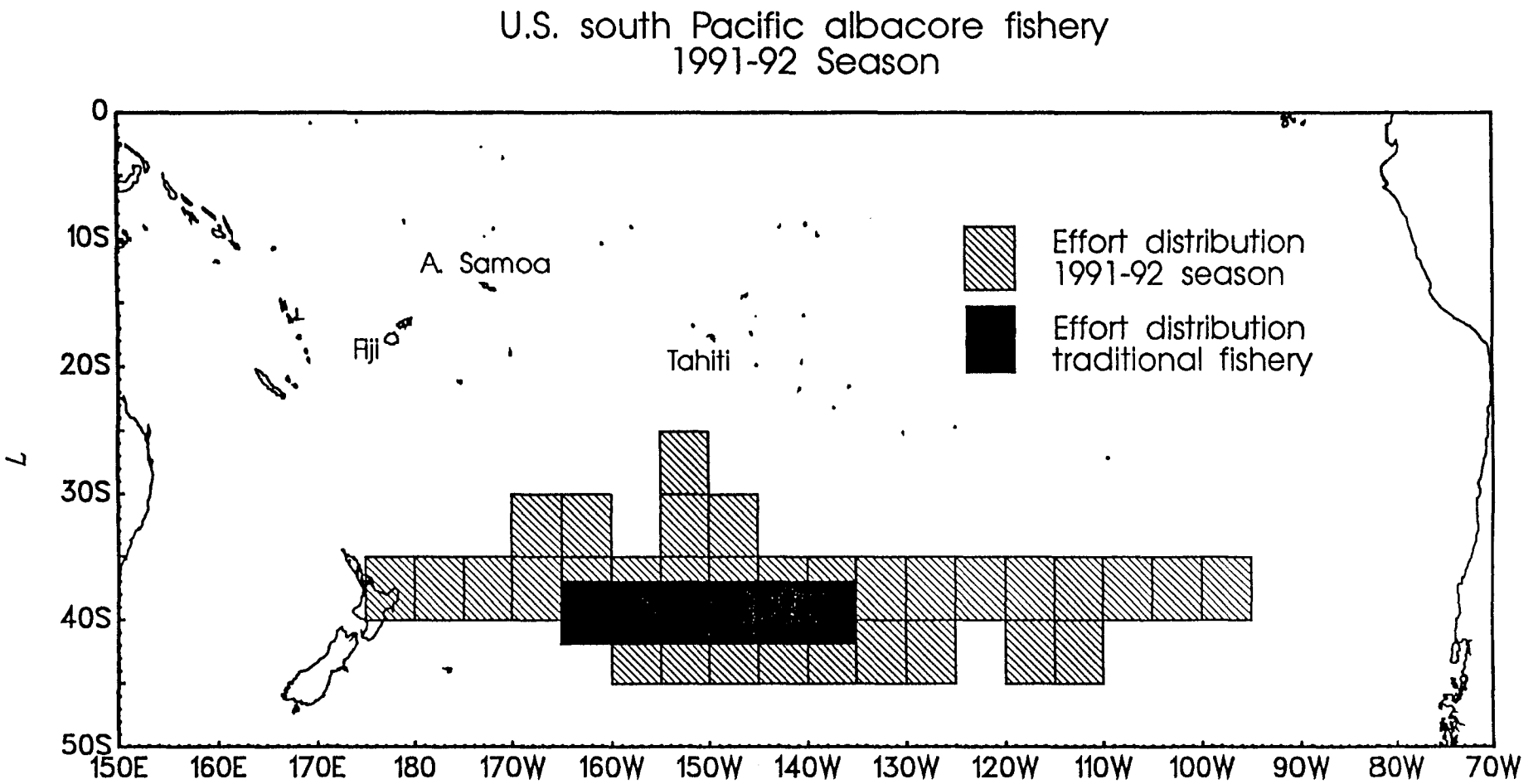

Figure 1. Fishing range and area of concentrated fishing for the U.S. albacore troll fleet during the 1991-92 fishing season in the south Pacific Ocean.

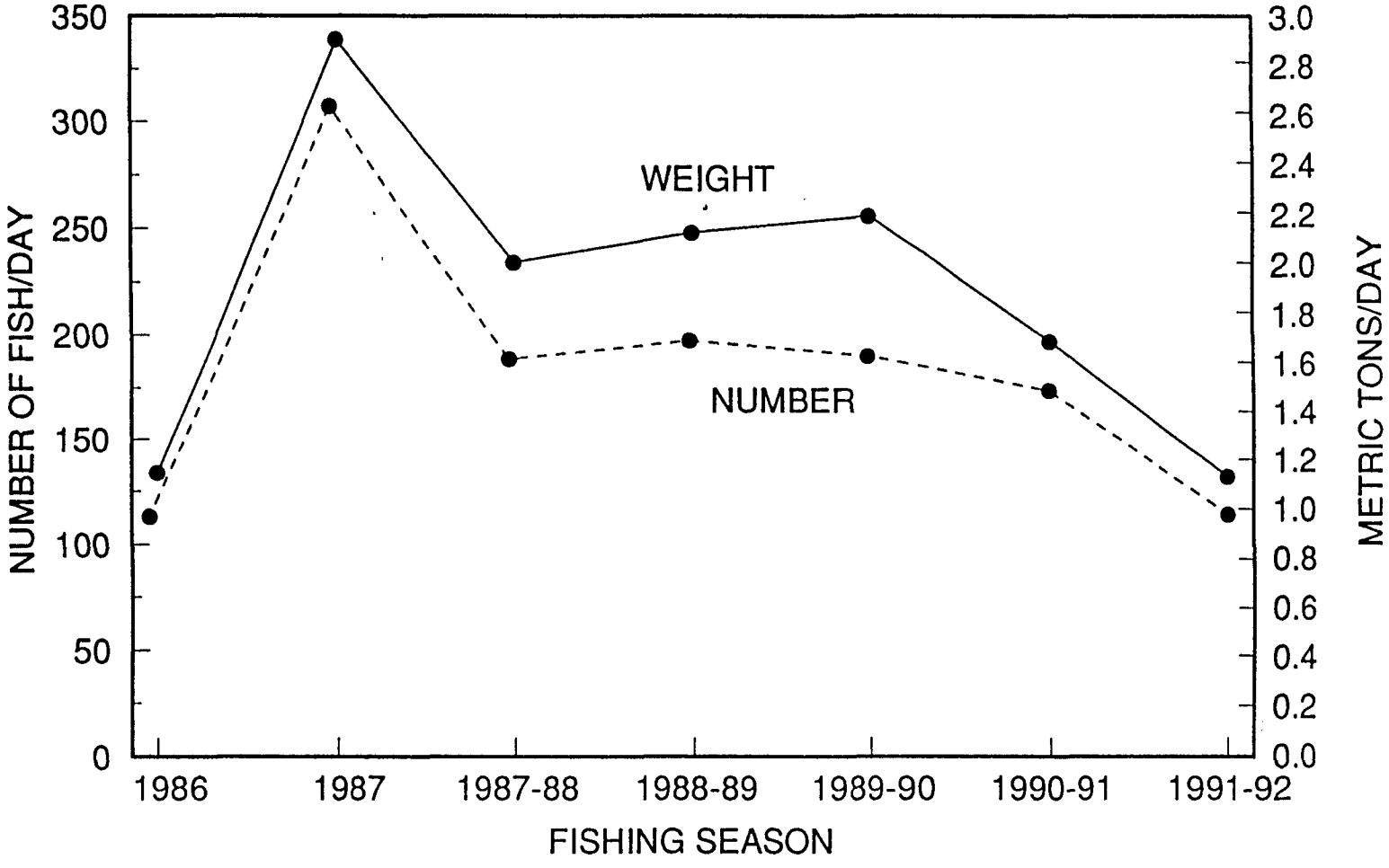

Figure 2. Overall catch rates by fishing season for the U.S. albacore troll fishery in the south Pacific Ocean.

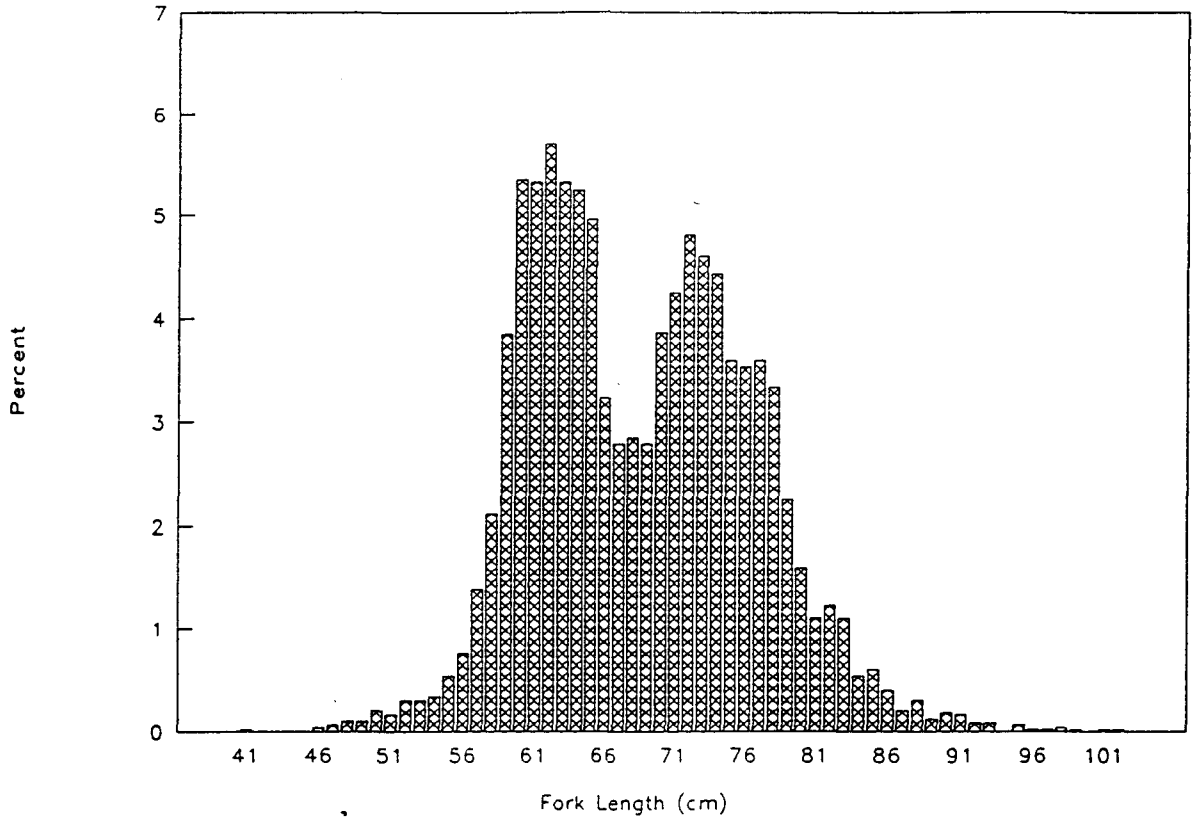

Figure 3. Length-frequency distribution (fork length) of albacore caught by the U.S. troll fleet during the 1991-92 fishing season in the south Pacific Ocean. The distribution is based on a sample size of 5,009 fish and with average length of 68.6 cm length.