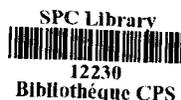


# Japanese Tuna Fisheries in the Western Pacific Ocean in 1995

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## 1. Introduction

Western Pacific Ocean is the main fishery area for Japanese longline (coastal and offshore), pole-and-line and purse seine fisheries. Last year, fisheries activity in 1994 were reviewed for these fisheries. In this paper, fishing activities and trends of these fisheries in 1995 are reported and latest statistics of these fisheries in the Western Pacific Ocean are provided. As the statistics area, WPYF area (Pacific Ocean of 40° N-40° S and west of 150° W) were used.

There is not any change in the classification of each fishery as the followings.

Longline fishery is classified into three categories (coastal, offshore and distant water) according to the license and boat size (coastal: less than 20 gross tonnage (GRT), offshore: 20-120GRT, and distant 120-500GRT). Coastal and offshore licensed boats are limited their operations in the western and central Pacific Ocean, while there is no limitation in the operation area for distant water licensed boats. However, fishing by distant water fleet in the western and central Pacific has been much smaller than the other categories. Pole-and-line fishery is similarly classified into three categories (coastal, offshore and distant water). The offshore and distant water categories need to be licensed by the Minister of Government. Purse seiners need license issued by the Minister except the very small-sized boat. Licenses of purse seine consist of many types derived from the combination of the fishing area and season allowed. Table 1 shows the number of the Japanese tuna boats registered in each fishery and category. The number of longline boats in coastal category shows rather increasing trend in these 5 years, while those of distant and offshore categories are gradually decreasing in the last decade. The declining trend is obvious in all categories of pole-and line, in which the boat number in 1994 comes to be about half of that of ten years ago. In purse seine, there isn't remarkable change in number of boats greater than 200GRT which is main vessel type in tropical western Pacific, while boats in 50-200GRT class decreased to about half of that of peak (50-59 boats) in early 1980s.

## 2. Tuna fishing activity in western Pacific Ocean in 1995, and latest statistics

### Longline fishery

Catch number and weight of tunas (albacore, yellowfin, and bigeye tunas), swordfish and billfishes (striped and blue marlines) caught by Japanese longliners in WPYF area which includes western and central Pacific, is shown in Table 2. Fishing area and distribution of catch in each species are shown in Figs. 1 and 2, respectively.

Latest available statistics is that of 1994 for longline fishery. Both of catch number and weight in these two years for bigeye (625 and 576 thousand fish, and 25790 and 21812 MT in 1993 and 1994 respectively) and yellowfin tuna (746 and 726 thousand fish, 25195 and 24195 MT) are lowest or very low level among past two decades. On the other hands, catch number and weight of albacore (1167 and 1114 thousand fish, 17318 and 16896 MT) is rather higher in 1993 and 1994 than the other years of last decade. These catch level of albacore is mainly due to the high catch from the western and central Pacific north of 20° in the first half of these year. In swordfish and striped marlin, there is no remarkable change in their recent catches, while slight decline is observed in both of catch number and weight for blue-marlin.

Fishing activity of Japanese longliners in western Pacific Ocean in 1995 was the following.

**Ogasawara Islands to Mariana Islands:** Operations were made in very wide area ranged 18° -28° N, 135° -155° E in the first half of 1995. In the first quarter, 13-15 coastal longliners (<20GRT) operated around 26° -28° N, 140° -142° E, and had slightly good catches (2.3MT in average per operation) mainly comprising large to extra large albacore (90-115cm). These catch diminished and disappeared in the second quarter. Around Mariana Islands (18° -25° N, 132° -155° E), 25-30 coastal longliners operated in the first half of the year. In the first quarter, they had good catches (2.5-3.0MT per operation) comprising mainly albacore. Large individuals exceeding 20kg were the main component in albacore catch, while two modes in 12kg and 36kg corresponding 2 and 3 years old groups were observed in yellowfin. In the second half of the year, 30-40 boats operated around 20° -27° N, 132° -155° E, and had yellowfin and albacore dominant catches (0.5-1.5MT, 1.0MT in average). Catch rates (the number of catch per total hooks) were ordinary level, although that of bigeye was somewhat lower (0.45% in yellowfin, 1.65% in albacore, 0.08% in bigeye, 0.30% in blue-marlin). Main size of yellowfin caught was 15-20kg (2 year old), while 25-30kg (3 year old) fishes were normally caught in this season and area. Large to extra-large fish (20-30kg, 6-8 years class) accounted for 80% of the total albacore catch as ordinary years.

**Micronesian area :** Constantly more than 300 longliners (mainly coastal boats) made operations in first half of the year. They made stable 1.2-2.0 MT per operation (1.4 MT in average), and catch rate were 0.40-1.08% in bigeye, 0.80-3.42% in yellowfin, 0.20% in albacore, and 0.15% in billfishes. In the second half of the year, longliners decreased to about 200 boats, and made operation around 5° -13° N, 130° -145° E. Their catch amount (0.5-1.5MT per operation) was the same level as that of this season in ordinary year. In the area from Marshall Islands to Truk Islands, about 15 boats made operation constantly, and caught 1.20 MT per operation in average (catch rate were 0.3-1.0%, 0.5-1.20% and 0.3-1.0% for bigeye, yellowfin and blue-marlin respectively). In the second half of the year, 1.8 MT average catch was observed in the area from Solomon Islands to Ellice Island and around Nauru Islands (1° -10° S, 165° -180° E).

**Coral Sea to Solomon Island area:** 15-35 distant water licensed boats (200-500GRT) operated from end of the first quarter to early in the second quarter, and had 2.0-4.0 MT catches per operation. In the late of second quarter, most of them moved to higher latitude area to catch southern bluefin tuna. In the second half of the year, 10-15 distant water boats made operation in the area from Coral Sea to New Caledonia Islands, and had 1.5-3.0 MT catch per operation in which yellowfin and albacore were dominant. Those yellowfin and albacore catches

mainly consisted of 2-3 year old classes and 6 year old class, respectively.

### Pole and line fishery

The catch and effort statistics in WPYF area by Japanese pole and liners are shown in Table 3. Catch in skipjack, yellowfin, and bigeye tuna in 1994 were 93446MT, 3936MT, and 1878MT respectively. In this decade, declining trends are shown particular in skipjack and yellowfin catch. These trends seem to be derived partially from decrease in the number of boats. Preliminary total catch of skipjack in 1995 was 112,000 MT.

Large-sized boats (298-499 GT): From late January to mid May, main fishing ground was located in the north equatorial current zone south of Guam Island (9° -12° N, 143° -147° E). Size ranges of skipjack caught were 3.0-4.5 and 5.0-8.0 kg. In late May, a good fishing ground was observed in the area between the Kiribati Islands and the Phoenix Islands (1° -2° N, 177° -179° E). Some vessels shifted to and fished (30-75 GT per Day) in this area by mid June. By the scouting in the Emperor Sea Mount area, most of vessels moved to south of the Emperor Sea Mount (30° -33° N, 168° -174° E) in early June. From June to late November, these large-sized boats operated in the northwestern North Pacific (north of 30° N, 147° -170° E). In these northern fishing ground, albacore was the target species in summer (August) and autumn (from late October to mid November) as well as skipjack. After fishing in these northern area, some scouting were made in the subtropical counter current zone east of the Mariana Islands in early November. The major fishing grounds in this periods were distributed broadly in the area west of the Marshall Islands (1° -4° N, 161° -167° E) and the area near the Kiribati Island (3° -4° S, 175° -177° W).

Medium and small-sized boats (less than 150 GT): Fishing operations started in February in the area north of the Micronesian waters (13° -14° N). Two major fishing grounds were observed in March to April, one of which was waters west of the Mariana Islands and the other was waters south of Kyusyu. From May through November the northwestern Pacific close to northern Japan (35° -42° N, 140° -150° E) became the main fishing ground followed by the fishing ground near Kyusyu. In this main fishing ground, the size range of fish caught was 1.5-3.0 kg.

### Purse seine fishery

The catch and effort statistics in WPYF area by Japanese purse seiners are shown in Table 4. Catch in skipjack, yellowfin, and bigeye tuna in 1995 were 138607MT, 43284MT and 1200MT respectively. Distribution of fishing effort and catch in these species are shown in Fig.4 and Figs. 5. Catches in these species don't show remarkable change in this decade.

In the first half of 1995, catch estimates are 78,073, 15,523 and 1,486 MT for skipjack, yellowfin and bigeye, respectively. At early in January main body of purse seiners operated in south of Ocean Island (4° -9° S, 168° -174° E), where high SST was observed (29.6°C-30.2°C). Operations targeting log-associated or free swimming fish schools recorded fairly good catch (20-200 MT/set) with an average of 40 MT/set, comprising 1.3-8 kg of skipjack and 1.5-30 kg of yellowfin. An approximate ratio of yellowfin to the total number of fish was 10%. The fleets moved to south west of Nauru Island (1° S-1° N, 159° -168° E) at late in January. They mainly targeted log-associated fish school, and the catch ranged from 15 to 180 MT/set, comprising 1.3-4 kg of skipjack and 1.5-15 kg of yellowfin. The ratio of yellowfin increased to 20%. In February to April main fishing ground was shifted further westward south of Caroline Islands (1° -10° N, 140° -152° E). Operation targeting free

swimming school caught 2-10 kg of skipjack and 6-45 kg of yellowfin. Catch per set ranged from 0 to 200 MT. Infrequent operation on log-associated fish school also scored good catch with an average of 35 MT/set. The fish size ranged from 1.5-4 kg in skipjack, 1.5-20 kg in yellowfin and 2-6 kg in bigeye. Ratio of yellowfin slightly increased (25-30%) in March and April, and notable large ratio of bigeye comparable with or even larger than yellowfin was characteristic. Fishing ground became wider (5° -10° N, 133° -152° E) in May and June. Catch ranged from 20 to 140 MT/set, comprising 1-7 kg of skipjack and 1.5-40 kg of yellowfin. Although 2-7 kg bigeye was still somewhat abundant in May, the ratio steeply fell in June.

In the second half of 1995, catch estimates are 40,005, 26,078 and 524 MT for skipjack, yellowfin and bigeye, respectively. Operation in July and August was observed in wide range (1° -11° N, 129° -157° E)(SST 29.1°C-30.1°C), but main body of purse seiners (24-25 vessels) stayed in the west of 142° E. Catch was slightly low-toned (0-80 MT/set), comprising 0.6-8 kg of skipjack and 0.7-30 kg of yellowfin. Fishing grounds in September can be divided into two areas; 1° -8° N, 134° -152° E and 0° S-3° N, 153° -158° E. 5 to 6 vessels operated in the former, where they targeted log-associated fish school with catch of 0 to 40 MT/set. Fish size ranged from 0.5-5 kg in skipjack and 0.5-10 kg in yellowfin, and the ratio of yellowfin was 25%. 20 vessels operated in the later, targeting mainly free swimming fish school. Catch varied among sets and vessels ranging from 0 to 200 MT/set, comprising 2-6 kg of skipjack and 20-40 kg of yellowfin. Cruising duration was relatively long with an average of 55 days. In October, 25 vessels operated 0° S -4° N, 153° -157° E. Targeting mainly free swimming school of yellowfin yielded 0-100 MT/set with an average of 20 MT/set. Fish size was 5-8 kg and 20-50 kg in yellowfin and 2-5 kg in skipjack. Ratio of yellowfin was 54%. 20 vessels operated in south of Truk Island (0° S -2° N, 152° -156° E). Catch per set for free swimming school of yellowfin ranged from 0 to 230 MT, comprising of 20-50 kg of yellowfin, 3-8 kg of skipjack (40%) and 30-50 kg of bigeye. Operation targeting log-associated fish school was observed in slightly westward area (4° -5° N, 138° -144° E). Catch was 5 to 50 MT/set, comprising 0.5-3 kg of skipjack and 0.5-10 kg of yellowfin (25-30%).

### **3. Recent research activity**

#### **Data processing and compilation**

Using record sheets on operations and catch information sent from Japanese longliners and purse seiners, the NRIFSF(National Research Institute of Far Seas Fisheries) compiles statistics of these fisheries. This institute also prepares and sends these statistics in required forms to each of international organisations of fisheries resource management (SPC, ICCAT, IATTC, IPTP, etc). Catch and effort statistics of tuna longline fisheries up to 1994 in month by 5 degree strata, and those of purse seine up to 1995 in month by 1 degree strata were sent to SPC. Preliminary data for 1995 longline fisheries were also provided. Pole-and -line statistics are prepared by the Tohoku National Research Institute of Japan in similar procedure.

#### **Research on under water condition of longline gear**

Hook depth of longline gear can be calculated theoretically by the size and weight of gear (including its resistance

and buoyancy factor), casting speed of main line, and vessel speed in casting the main line. However, considering that whole longline gear (including floats and float lines, main line, branch lines and hooks) exists in wide depth range in water column (i.e. floats at sea surface, and branch line and hooks in 100-250m depth), the effect of oceanic environment, particularly sea current, on the longline shape could not be ignored. In order to know the real shape of longline gear under the water and interaction with oceanic condition, small data loggers were attached to longline gears, and the change in gear depth were monitored. This research started last year, is being performed also in this year (from 5 May to 24 August), and several operations for the research have just made by 'Shoyomaru', a research vessel of Japanese government. In this year, new type of data loggers (Murayama electronic Co., refer to the appendix for detail on this data logger) were used to monitor gear depth. An example on change of gear depth with time are shown in Fig.6. These depth data would be analyzed with environmental data.

Table 1. Number of the Japanese tuna boats registered by fishery and category.

Year	Longline			Pole-and-line			Purse seine	
	Distant Water	Offshore	Coastal	Distant Water	Offshore	Coastal	200 GRT >	50-200 GRT
70	973	580	890	226	286	3148	NA	NA
71	998	564	908	230	280	3168	6	23
72	942	489	940	272	282	3596	7	31
73	917	511	959	299	351	3020	6	37
74	962	554	518	325	391	3225	10	42
75	883	535	720	324	372	2648	12	42
76	840	556	827	292	361	3101	15	43
77	842	586	726	293	369	3348	14	50
78	847	633	669	285	360	3035	14	47
79	860	635	648	270	355	3480	17	46
80	883	637	821	240	332	3232	16	50
81	892	630	774	216	332	3064	23	50
82	802	554	722	179	296	3011	33	52
83	747	523	561	157	277	3021	36	59
84	810	478	523	142	254	2904	33	54
85	823	476	620	129	227	2754	35	47
86	818	442	536	120	210	2455	38	53
87	819	398	661	115	199	2404	34	47
88	807	385	586	97	180	2613	39	48
89	806	353	650	94	175	2254	37	43
90	791	362	685	88	167	2228	35	43
91	790	332	768	82	160	2277	45(10)*1	38
92	768	302	793	63	153	2093	48(10)*1	31
93	767	272	790	59	144	1927	46(10)*1	27
94	749	255	819	63	122	1830	43(11)*1	23

\*1 Numbers in the bracket are boats operating in the Indian Ocean.

Table 2. Catch in number (in thousand) and weight (MT), and fishing effort (million hooks) of the Japanese Longline Fishery (offshore and distant water-licensed boats) in WPYF total area.

Year	Hooks	Number of fish						Weight					
		ALB	BET	YFT	SWD	STM	BLM	ALB	BET	YFT	SWD	STM	BLM
70	172	1072	694	1149	114	170	135	NA	NA	40970	NA	NA	NA
71	176	786	720	1056	128	123	76	12827	29678	35664	6781	4785	4642
72	174	721	976	1046	118	86	100	11933	39476	38301	6272	3445	6168
73	160	793	684	1134	108	97	87	13130	27823	38094	5705	3762	5047
74	185	641	778	1152	119	91	89	11410	31368	37214	6194	3467	5110
75	158	425	734	995	126	59	58	7597	29247	36685	6416	2228	3311
76	179	762	871	1118	146	56	62	12699	37949	40420	7559	2110	3694
77	169	647	983	1535	132	37	68	10768	39735	47794	7255	1502	4157
78	183	573	839	2213	140	48	79	9626	31367	66576	7616	2028	4899
79	213	669	939	1759	158	88	69	10786	35497	57623	8411	3568	4439
80	222	703	913	2294	129	86	93	11804	34285	69063	6407	3382	6011
81	242	1047	756	1930	153	69	83	16917	28388	56520	7836	3080	5382
82	225	1007	872	1617	131	61	81	16213	32710	47864	6759	3084	5440
83	198	856	815	1627	151	45	64	13302	28987	51808	7909	2093	4234
84	203	717	889	1254	146	63	93	11187	31506	39654	7518	2786	6006
85	211	764	947	1328	196	88	80	11683	33348	46830	10205	3649	5185
86	184	673	752	996	175	114	85	10463	29820	32161	9109	4389	5422
87	182	660	942	901	177	70	61	10496	38416	29237	9099	2800	3805
88	202	789	769	1077	178	126	78	12111	29326	37827	9243	4740	4932
89	185	741	827	859	134	89	61	11205	32184	29878	6789	3825	3934
90	177	793	933	890	125	55	46	11798	37116	32408	6298	2333	2842
91	158	689	680	635	100	67	46	10935	25499	22544	5133	2528	2832
92	148	813	708	716	111	54	36	12466	30852	25363	8780	2330	2558
93	159	1167	625	746	118	83	53	17318	25791	25195	8977	3222	3446
94	150	1114	576	726	108	66	45	16896	21812	24195	8091	2765	3115

Table 3. Total catch (MT) of the Japanese pole and line fishery (offshore and distant water-licensed boats) in WPYF area.

Year	F. Days	SKJ	YFT	BET
72	44128	131678	5534	1626
73	53263	197151	6047	1141
74	53283	210915	4406	969
75	56753	171564	5415	1264
76	61798	212607	7306	3313
77	71276	233302	9895	3231
78	59621	219781	7628	3170
79	60943	197044	5833	2118
80	58180	215464	6186	1994
81	60768	192625	9050	2337
82	56619	182219	9490	3807
83	48343	209300	9326	3762
84	46531	245242	8690	3192
85	43324	158513	12920	3981
86	40093	222149	8410	2519
87	38400	170755	8452	2810
88	15564	122813	1908	1449
89	32095	174467	7789	3544
90	32135	110095	6925	3276
91	22330	144846	5405	1230
92	21735	109447	6829	1033
93	21624	144001	4526	1770
94	17934	93446	3936	1878

Table 4. Total catch (MT) by the Japanese purse seine fishery (larger than 100 GRT boats) in WPYF area.

Year	Days fishing	SKJ	YFT	BET
70	114	365	164	0
71	2651	7946	2837	129
72	3304	12071	4184	119
73	3355	12334	7268	182
74	2074	4837	9419	294
75	2510	6732	5595	265
76	3136	17719	7649	390
77	2638	18387	6841	302
78	2932	25821	8523	609
79	4219	28298	19013	706
80	4271	42040	19973	564
81	5393	44473	27539	925
82	7150	75016	31029	1129
83	10086	115751	30819	1468
84	12698	128528	38647	697
85	12491	119287	47947	1381
86	11716	130805	44463	1531
87	11199	112975	44634	1602
88	11178	174373	30106	605
89	11273	120495	40872	1527
90	10178	139271	37741	2122
91	9851	147437	48498	1950
92	9287	137828	53078	2563
93	10720	132522	57866	1885
94	8747	157692	39858	1676
95	10279	138607	43284	1200

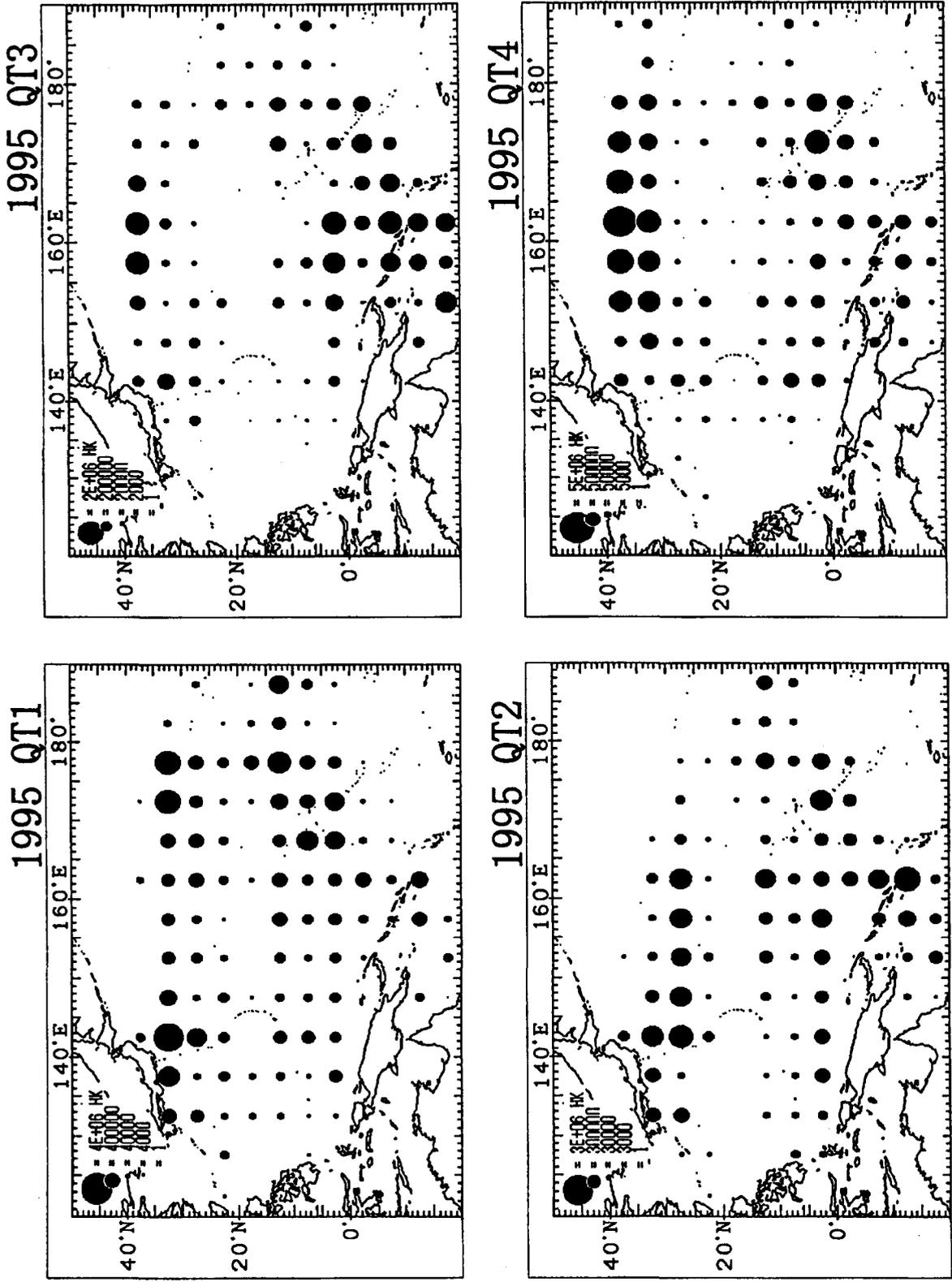


Fig. 1. Distribution of fishing effort for the Japanese longline fishery (offshore and distant water licenses) in the western and central Pacific Ocean in 1994.

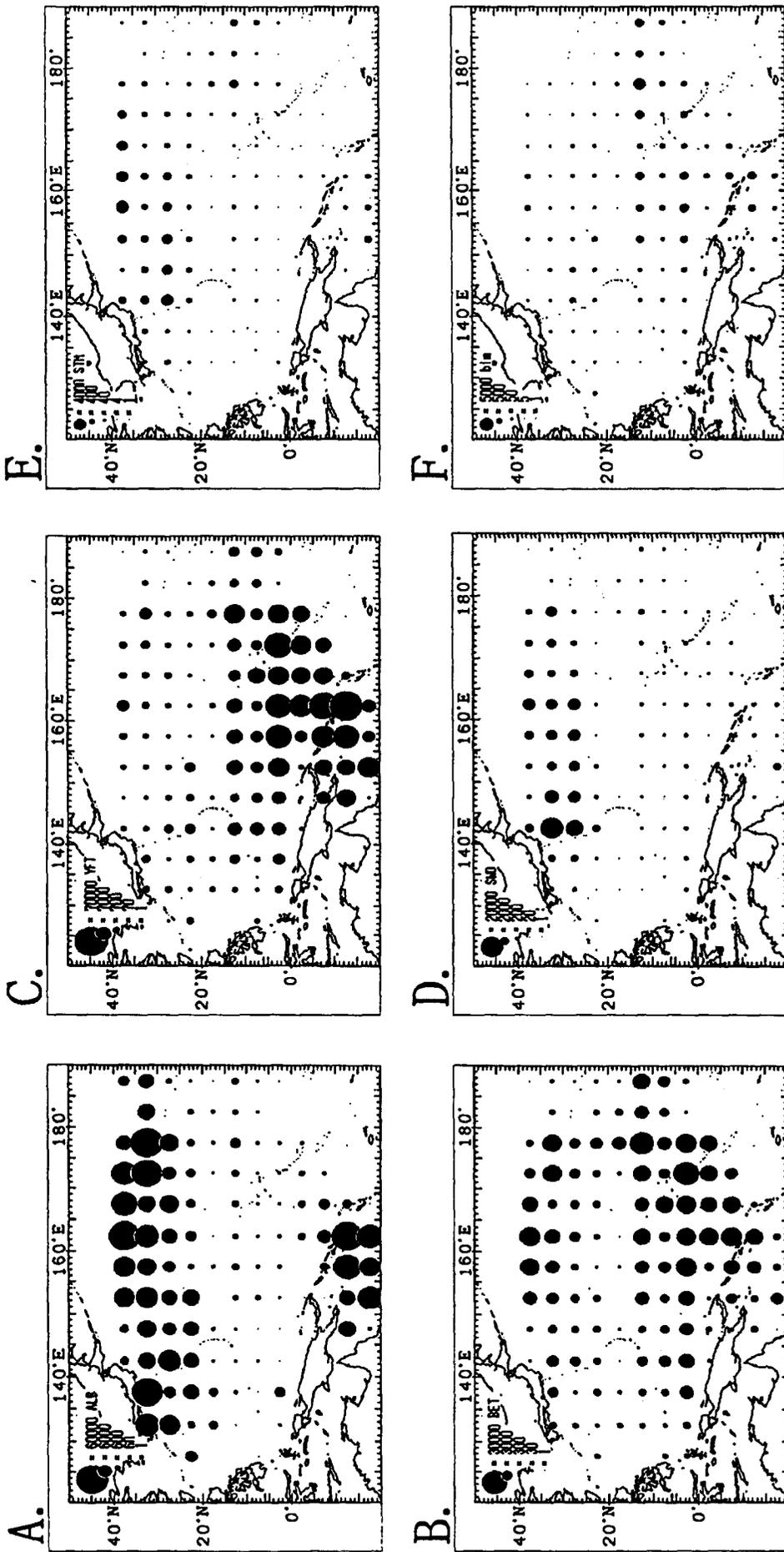


Fig. 2. Distributions of longline catch in 1994 for six main target species (A: albacore, B: bigeye tuna, C: yellowfin tuna, D: swordfish, E: striped marlin and F: blue marlin).

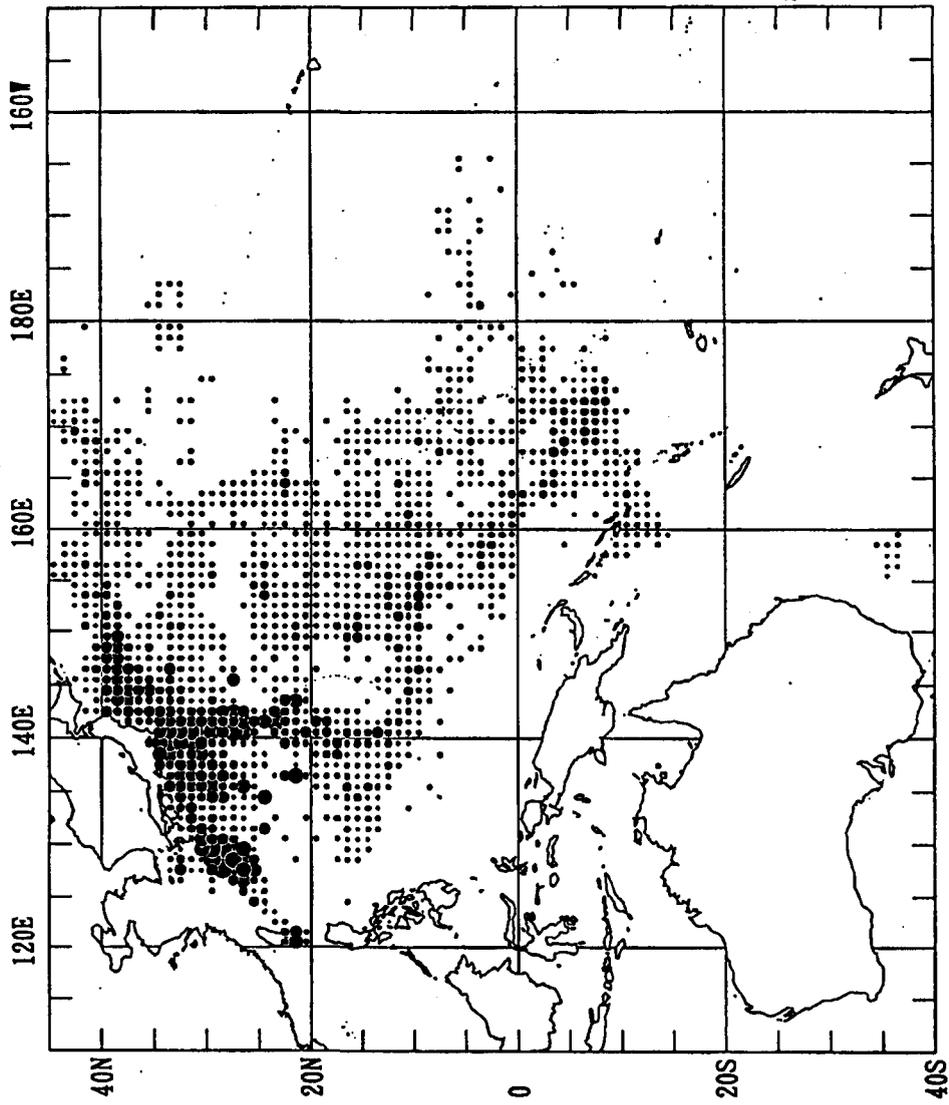


Fig. 3. Distribution of fishing effort for the Japanese pole and line fishery (offshore and distant water licenses) in the Pacific Ocean in 1994.

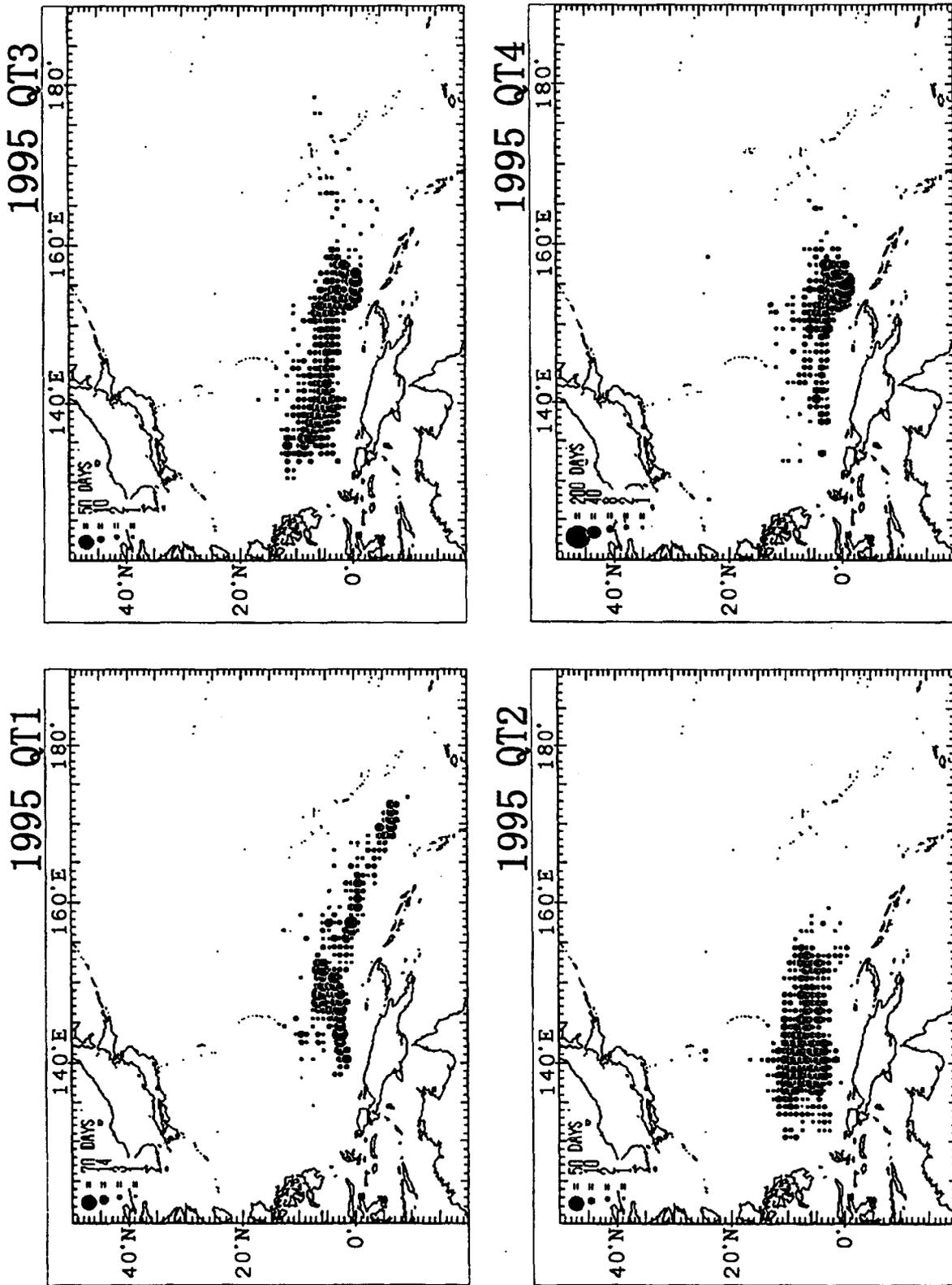


Fig. 4. Distribution of fishing effort for the Japanese purse seine fishery (larger than 100 GRT) in the Pacific Ocean in 1995.

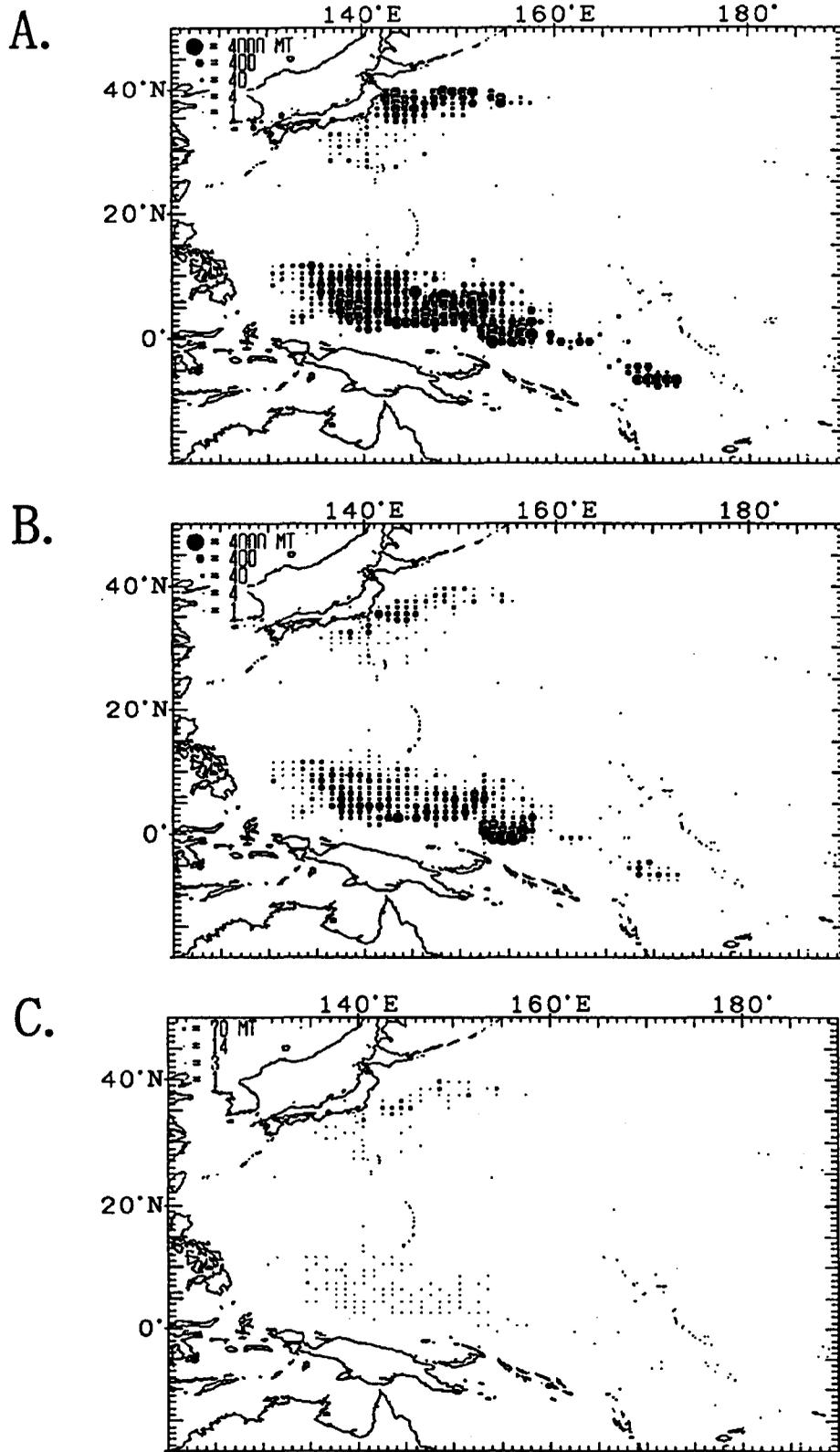
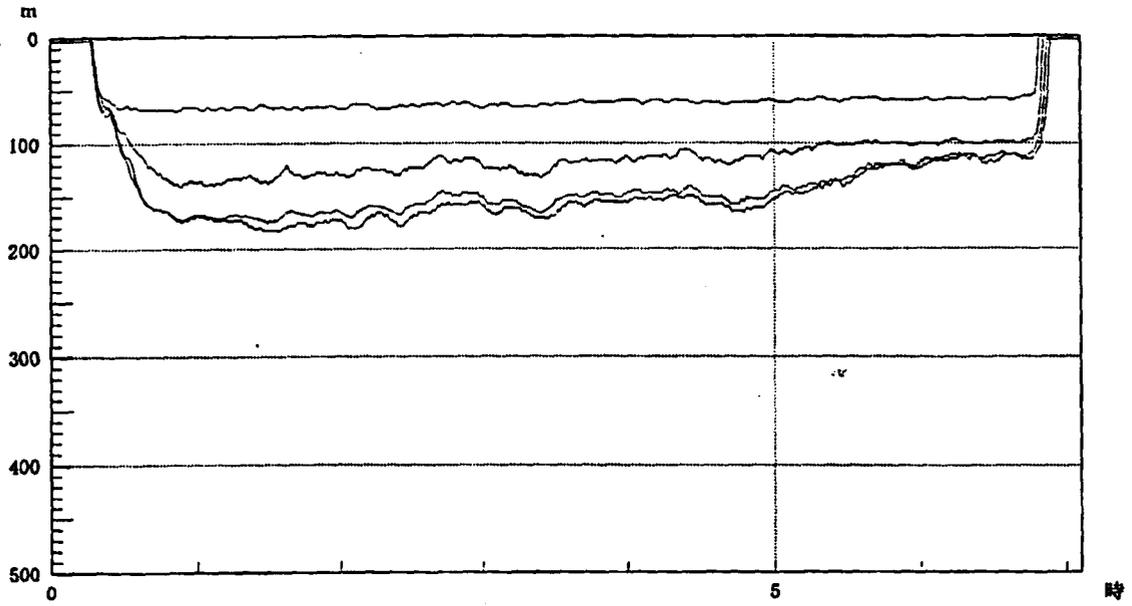


Fig.5. Distribution of purse seine catch in 1995 for skipjack tuna(A), yellowfin tuna(B), and bigeye tuna(C).

時間/深度 合成グラフ



時間/深度 合成グラフ

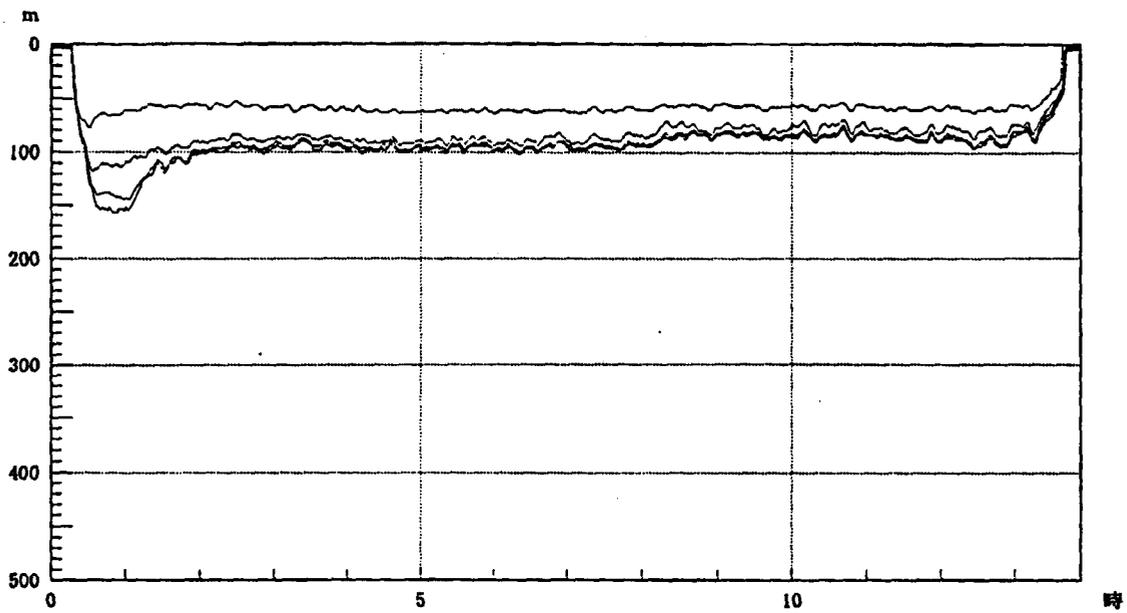


Fig.6. One example of depth change of the hook with time for each of 1st, 3rd, 5th and 7th line in 13 branch line of 1st(upper figure) and 54th(lower figure) basket in one operation.

*Murayama*

**NEW MODEL**

FOR WATCHING OF LONGLINE DEPTH & CATCHING LOCATION !

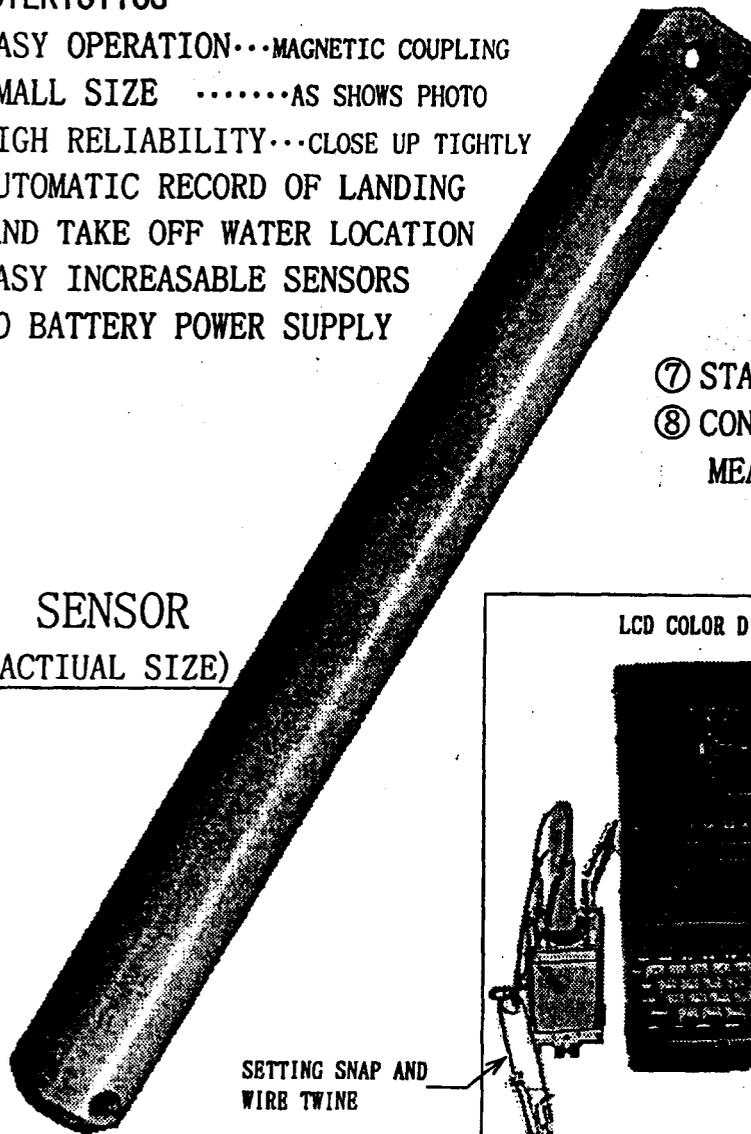
# SBT-500

## SMALL B.T.SYSTEM

### CHARACTERISTICS

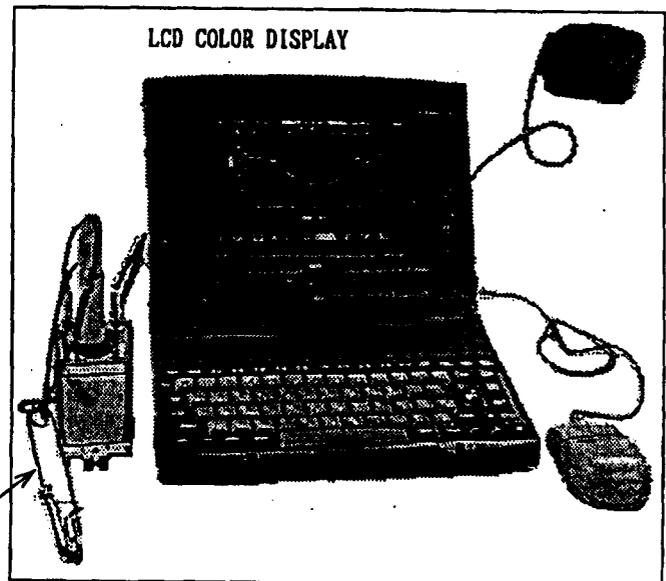
- ① EASY OPERATION...MAGNETIC COUPLING
- ② SMALL SIZE .....AS SHOWS PHOTO
- ③ HIGH RELIABILITY...CLOSE UP TIGHTLY
- ④ AUTOMATIC RECORD OF LANDING  
AND TAKE OFF WATER LOCATION
- ⑤ EASY INCREASABLE SENSORS
- ⑥ NO BATTERY POWER SUPPLY
- ⑦ STANDARD THREE SENSORS
- ⑧ CONTINUOUSLY 40 HOURS  
MEASURING

SENSOR  
(ACTUAL SIZE)



SETTING SNAP AND  
WIRE TWINE

### STANDARD ACCESSORY G P S



LCD COLOR DISPLAY

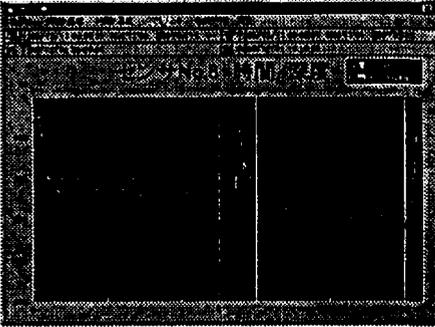
MURAYAMA DENKI LTD.

## FUNCTION

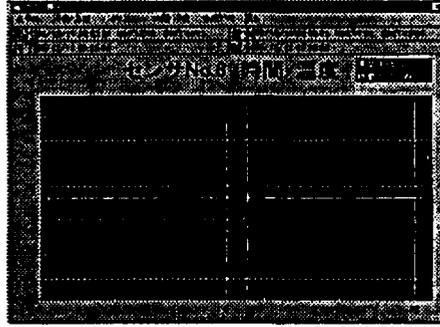
- ◆STANDARD ACCESSARY: THREE PCS OF SENSORS. POSSIBLE TO WATCH THE LOPE SOWNWARD DEPTH AND CONDITION.
- ◆WITH G P S ATTACHED, SENSOR LOCATION WHERE ARE DOWNWARD AND UPWARD DIRECTION.
- ◆SAME AS USUAL DEPTH/TEMPERATURE GRAPH SHOWS, AND POSSIBLE WATCH TEMPERATURE (FIG. ③).
- ◆AS GPS VIEWER FUNCTION, INDICATE THE FURROW AND LOPE LOCATION.

DISPLAY SHOWS : FOUR WAY DISPLAY FUNCTION

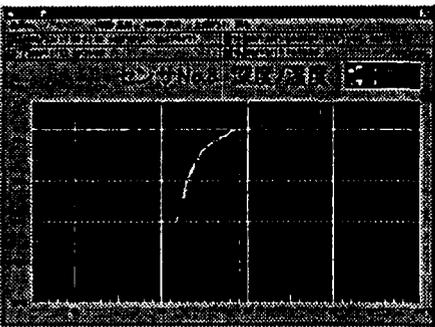
① TIME VS, DEPTH



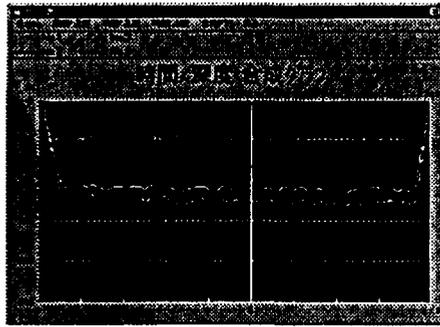
② TIME VS, TEMP.



③ DEPTH VS, TEMP.



④ MULTIPLE DATA DISPLAY



- ※NO. 1 DISPLAY SHOWS ACTUAL, ONE SENSOR HOOKED UP ON BRANCH AND CAUGHT, MONE TUNE AT SAME BRANCH.
- ※ARRANGEMENT OF DISPLAY WILL BE MODIFIED FOR BETTER REFORMATION.

## SPECIFICATIONS

MEAS. RANGE TEMP. :  $-5\sim 40^{\circ}\text{C}$  (0.1 $^{\circ}\text{C}$ )  
(RESOLUTION) DEPTH : 0~500 m (1 m)  
ACCURACY TEMP. :  $\pm 0.1^{\circ}\text{C}$  (+1digit)  
DEPTH :  $\pm 0.5\%$  (+1digit)  
OPERATING TIME : ABOUT 40 HOURS  
DATA READOUT TIME : ABOUT 4 MINUTES  
CHARGING TIME : ABOUT 10 MINUTES

### STANDARD COMPOSITION

SENSOR 3 PCS  
TRUNK CASE WITH CHARGER 1 PCS  
NOTE TYPE PERSONAL COMPUTER  
INTERFACE UNIT  
FLOPPY DISK FOR DATA  
GPS RECEIVING DEVICE  
OPTION PRINTER

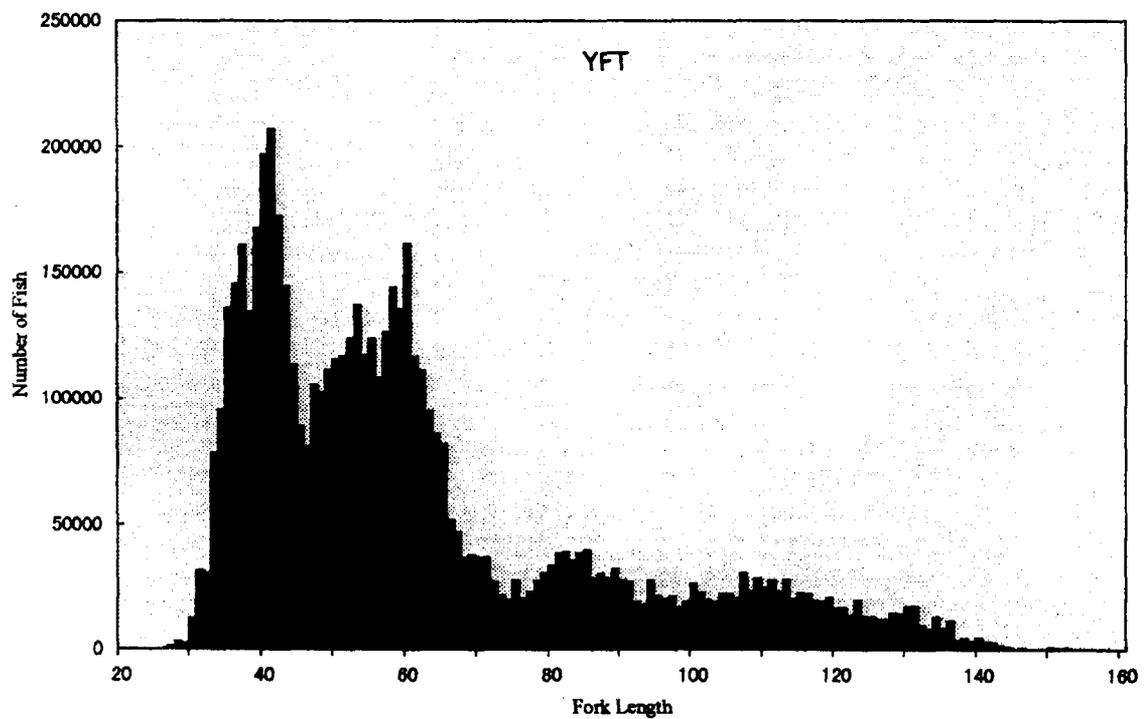
# MURAYAMA DENKI LTD.

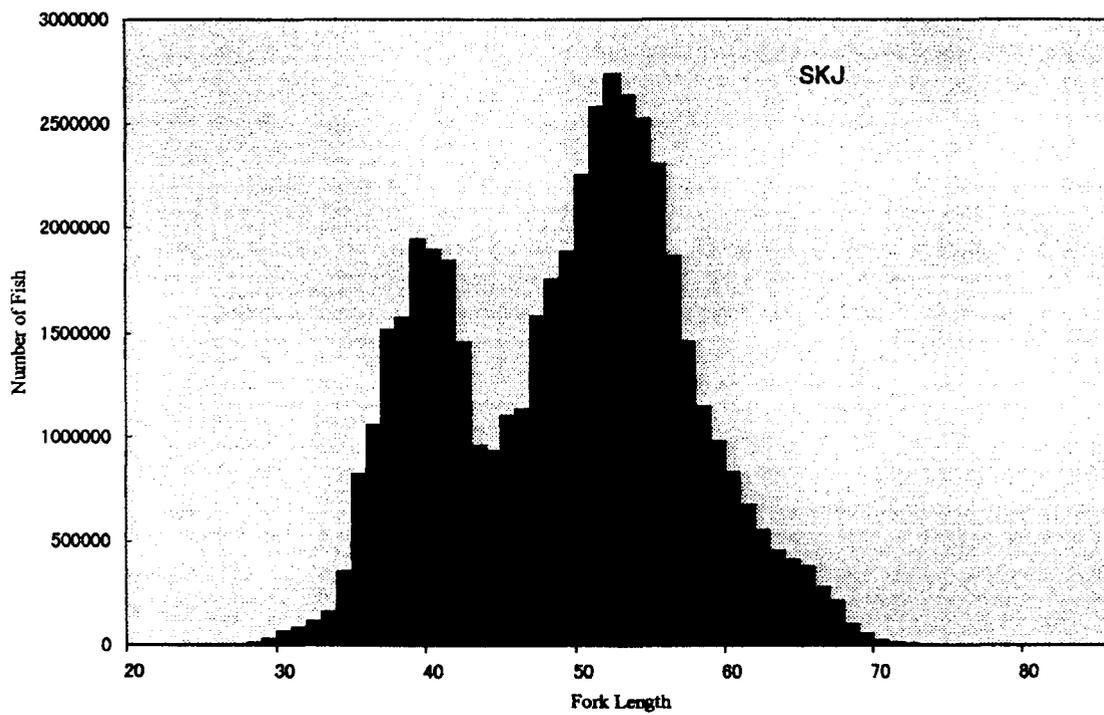
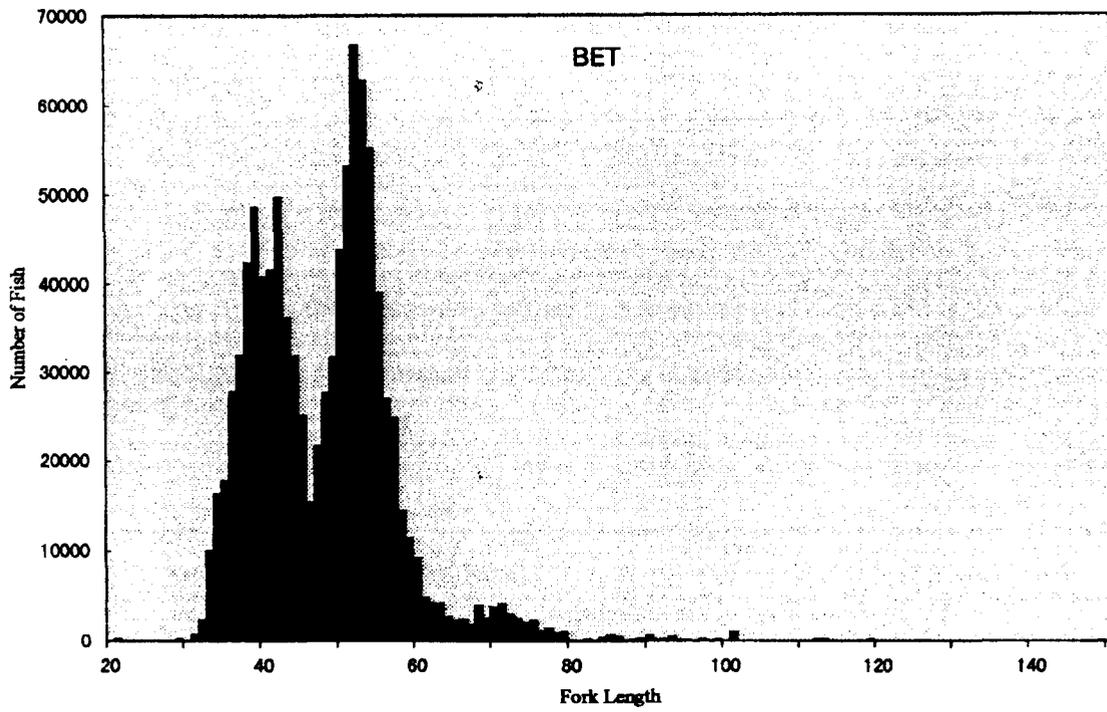
No. 13-1, 2-chome, Gohongi, Meguro-ku, Tokyo, Japan  
PHONE 711-5201-5 CABLE ADDRESS SEATEMP TOKYO

December, 1995

## Supplement to the Japanese National Report

Estimated catch-at-size for the Japanese tropical purse seine fishery in the western and central Pacific during January 1995 to February 1996. Measurements were taken from 37 trips by market categories through port sampling.





Japan, national reports

Revision Table 3

Table #. Total catch (mt) of the Japanese Pole and Line fishery (offshore and distant water-  
3 licensed boats) in the WPYF area.

Year	F.Days	SKJ	YFT	BET
1972	44,128	131,678	5,534	1,626
1973	53,264	197,151	6,047	1,141
1974	53,288	210,939	4,406	969
1975	56,766	171,708	5,415	1,279
1976	61,798	212,607	7,306	3,313
1977	71,276	233,302	9,895	3,231
1978	59,621	219,781	7,628	3,170
1979	60,943	197,044	5,833	2,118
1980	58,180	215,464	6,186	1,994
1981	60,768	192,625	9,050	2,337
1982	56,619	182,219	9,490	3,807
1983	48,353	209,335	9,329	3,762
1984	46,531	245,242	8,690	3,192
1985	43,324	158,513	12,920	3,981
1986	40,093	222,149	8,410	2,519
1987	38,404	170,757	8,452	2,810
1988	29,281	179,259	7,188	3,644
1989	32,095	174,467	7,789	3,544
1990	32,135	110,095	6,925	3,276
1991	22,330	144,846	5,405	1,230
1992	21,735	109,447	6,829	1,033
1993	21,624	144,001	4,526	1,770
1994	17,934	93,446	3,936	1,878

revised  
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