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Korean tuna fisheries in the western Pacific Ocean

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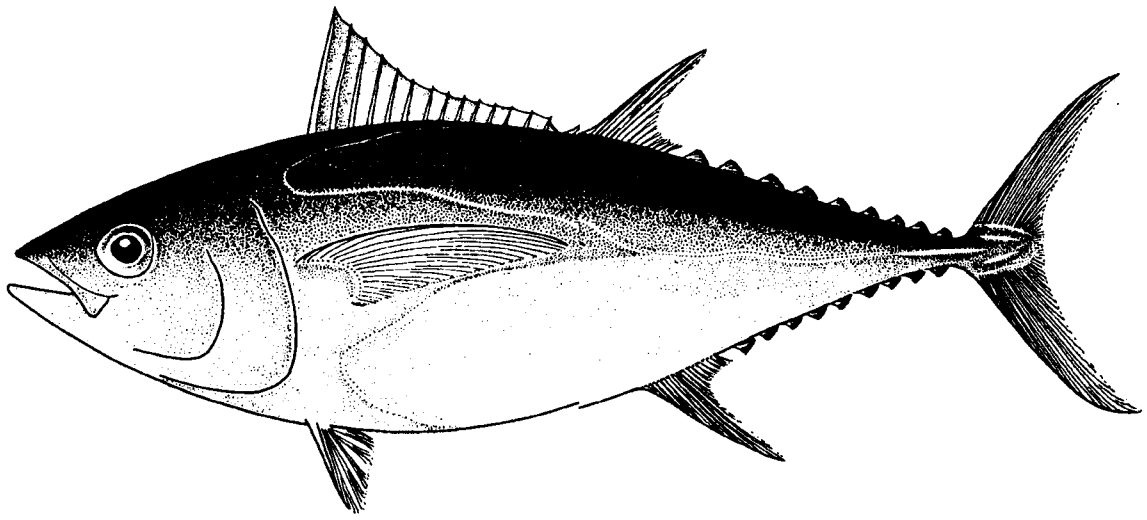

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Tuna Fisheries

A total of 197 vessels (171 longliners and 26 purse seiners) for catching tuna and tuna-like species were active in the Pacific Ocean including the WCPO (west of 150°W) during 1999 (Table 1). Compared to previous year, longliners increased by 2 vessels, but purse seiners remained same.

Tuna longliners range from 200 to 600 gross tonnage (GRT) and most of vessels are in the size range of 300~500 GRT. The purse seiners are in a broad range between 800 and 1,400 GRT.

Total catch of tunas and tuna-like species from the vessels in the WCPO during 1999 was estimated to be about 173,539 mt, a decrease of 26.3% over the previous year's catch (Table 1). Of the total catch, 142,091 mt (77.6%) was made by purse seiners and 31,448 mt (22.4%) by longliners.

Longline fishery

Longliners were operating through the whole tropical areas in the Pacific Ocean in 1999, a total of 71 longliners participated in fishing for tunas and billfishes. The 1999 total catch of longline fishery in the WCPO was estimated to be about 31,448 mt, a decrease of 9.0% over the previous year's catch (Table 1). From 1990 onward, the longline catches maintained stable levels between 25,000 mt and 35,000 mt.

Species composition of longline catch in 1999 consisted of 50.1%, 22.4%, 2.5% and 25.0% for bigeye, yellowfin, albacore and other species including billfishes, respectively (Table 2). Catch of bigeye decreased by 15.6% to 15,769 mt from 18,679 mt in 1998 and that of yellowfin also decreased by 27.1% to 7,022 mt compared to previous year. Considerable decrease in albacore catch was shown in 1999.

Catch per unit effort (CPUE) of Korean longline fishery in 1999 was calculated to be 1.06 fish/100 hooks (Table 2), a decrease by 46.7% compared to 1998. CPUE by species showed that bigeye and yellowfin tuna decreased to 0.56 fish/100 hooks from 1.00, yellowfin tuna decreased to 0.28 fish/100 hooks from 0.39 in 1997.

Recent distribution maps of Korean tuna longline fishery showed that

fishing grounds were mainly formed in the central tropical area between 20°N and 20°S (Fig. 1). No significant shift in fishing area was observed, although slight change of CPUE distribution within the same species has occurred as in the previous years. While the CPUE for bigeye and yellowfin tuna was relatively higher in the central and western area respectively, that of albacore was higher in southwestern waters between 155° E and 180°.

Purse seine fishery

Purse seiners have been concentrating their fishing activities in the western Pacific through the year. Since 1990, there has been a steady decrease in number of Korean purse seiners operating in this region. In 1999, a total of 26 purse seiners were active around the WCPO area (Table 1). The total catch of this fishery in 1999 was estimated to be 142,091 mt, a decrease of 29.3% from the 1998 catch.

Skipjack was dominant species in the catch composition as in the past years, accounting for 77.2% of the total catch (Table 3). Yellowfin contributed to 22.5% of the total catch and other species including bigeye tuna was reported to be comparatively minor in quantity. Catch by species from this fishery showed that skipjack decreased to 109,773 mt, 23.5% decrease from the 1998 catch and yellowfin was down 44.2% to 32,073 mt compared with the previous year's figure (Table 3).

In 1999, some purse seiners moved back to the western tropical area off PNG in which major fishing activitise have been carried out by Korean fleets. As in the past years, fishing grounds were formed in board area between 135° and 175° E

Research Activities

Data collection and compilation for catch and effort statistics on tuna longline and purse seine fisheries were continued under responsibility of the National Fisheries Research and Development Institute (NFRDI) for the scientific purposes during 1999.

Biological sampling of purse seine catch has been carried out at a domestic landing site once a month to obtain size data for skipjack, yellowfin and bigeye tuna, occasionally, and information on reproductive biology of yellowfin and skipjack.

Table 1. Korean fisheries statistics for the Pacific tunas in the SPC area

Year	Vessel active			Catch (mt)		
	LL	PS	TOTAL	LL	PS	TOTAL
1975	253		253	33,262		33,262
1976	257		257	56,196		56,196
1977	217		217	50,863		50,863
1978	223		223	43,236		43,236
1979	216		216	52,045		52,045
1980	211	2	213	50,405	544	50,949
1981	209	3	212	35,582	2,044	37,626
1982	121	10	131	30,654	12,209	42,863
1983	102	11	113	23,086	16,216	39,302
1984	96	12	108	22,104	14,183	36,287
1985	94	11	105	40,012	11,279	51,291
1986	134	13	147	41,122	27,732	68,854
1987	138	20	158	38,590	58,752	97,342
1988	124	23	147	34,954	79,397	114,351
1989	152	30	182	25,134	115,754	140,888
1990	182	39	221	35,662	173,343	209,005
1991	220	36	256	25,056	227,518	252,574
1992	166	36	202	30,243	182,287	212,530
1993	148	34	182	25,735	126,648	152,383
1994	160	32	192	33,378	195,004	228,382
1995	154	30	184	29,232	175,464	204,696
1996	156	28	184	29,583	148,816	178,399
1997	148	27	175	35,316	159,469	194,785
1998	169	26	195	34,532	200,905	235,437
1999	171	26	197	31,448	142,091	173,539

LL : Longline, PS : Purse seine
LL and PS vessels are from the entire Pacific Ocean including the SPC area.
Longline catches are re-estimated by the National Fisheries Research and Development Institute (NFRDI) on the basis of data (statistical sea-block, 5° longitude x 5° latitude) compiled from Korean tuna vessels' logsheets.

Table 2. Catch and CPUE statistics for longliners of Korea in the SPC area

Year	Hooks	Albacore		Bigeye		Yellowfin		Others	Total	
		Catch	CPUE	Catch	CPUE	Catch	CPUE	Catch	Catch	CPUE
1975	57,102	6,261	0.19	13,543	0.70	9,529	0.39	3,929	33,262	1.44
1976	86,867	9,008	0.71	20,176	0.57	15,118	0.62	11,894	56,196	2.09
1977	92,492	11,454	0.70	15,978	0.62	16,179	0.85	7,252	50,863	2.31
1978	56,661	11,302	1.45	7,878	0.65	13,812	1.07	10,244	43,236	3.37
1979	90,883	11,046	0.72	12,448	0.51	18,421	0.98	10,130	52,045	2.33
1980	93,835	9,640	0.61	13,106	0.38	22,795	0.87	4,864	50,405	1.96
1981	96,735	13,153	0.89	7,838	0.26	10,245	0.37	4,346	35,582	1.64
1982	71,750	11,499	1.00	6,988	0.35	8,954	0.55	3,213	30,654	2.03
1983	45,162	6,997	1.17	5,923	0.46	8,445	0.78	1,721	23,086	2.52
1984	52,994	5,212	0.68	7,086	0.47	6,792	0.59	3,014	22,104	1.87
1985	90,521	12,935	0.79	10,022	0.52	10,047	0.60	7,008	40,012	2.02
1986	67,313	15,677	0.91	10,156	0.54	9,532	0.68	5,757	41,122	2.24
1987	68,239	6,921	0.35	15,119	0.70	10,059	0.70	6,491	38,590	1.79
1988	76,461	6,171	0.40	11,928	0.48	10,835	0.58	6,020	34,954	1.56
1989	66,546	3,905	0.15	9,774	0.42	7,841	0.49	3,614	25,134	1.14
1990	73,216	3,062	0.09	15,898	0.69	12,218	0.62	4,484	35,662	1.48
1991	53,452	1,224	0.15	12,103	0.88	8,247	0.55	3,482	25,056	1.60
1992	62,125	195	0.24	14,860	0.79	11,212	0.81	3,976	30,243	1.95
1993	56,190	79	0.11	12,580	0.77	8,118	0.61	4,958	25,735	1.60
1994	76,380	95	0.11	19,603	0.86	9,794	0.37	3,886	33,378	1.44
1995	81,831	39	0.19	15,389	0.61	9,483	0.44	4,321	29,232	1.39
1996	73,420	370	0.09	13,846	0.56	11,801	0.67	3,566	29,583	1.39
1997	68,241	1,748	0.08	14,557	0.77	12,267	0.82	6,744	35,316	1.77
1998	66,193	2,680	0.22	18,679	1.00	9,623	0.39	3,550	34,532	1.99
1999	76,280	793	0.10	15,769	0.56	7,022	0.28	7,864	31,448	1.06

Units : hooks in thousands, catch in mt and CPUE in numbers of fish per 100 hooks

1. Catches for 1975-1980 were determined as follows : the numbers of fish caught in the SPC area, determined from logbook data aggregated by 5° ×5° by month published in NFRDI (1980, 1981, 1985), were multiplied by average weights and divided by coverage rates.

2. Catches for 1981-1999 were determined as follows : weights of fish caught in the SPC area, determined from logbook data aggregated by 5° × 5° , were divided by coverage rates. The coverage rate by species is presented in Table 4.

Table 3. Catch statistics for purse seiners of Korea in the SPC area

Year	Haul	Skipjack	Yellowfin	Bigeye	Others	Total
1980	34	476	68			544
1981	209	1,462	582			2,044
1982	568	10,167	2,042			12,209
1983	409	15,417	799			16,216
1984	767	13,767	416			14,183
1985	570	9,655	1,624			11,279
1986	883	25,305	2,427			27,732
1987	1,749	40,918	17,383		41	58,752
1988	1,900	64,032	15,365	410		79,397
1989	2,533	80,903	34,532		85	115,754
1990	4,187	138,460	34,765	234		173,343
1991	8,304	171,951	55,416	118	147	227,518
1992	7,502	115,290	66,982	4		182,287
1993	6,208	73,989	52,659	15		126,648
1994	6,352	145,541	49,463			195,004
1995	5,301	137,848	37,616			175,464
1996	5,374	129,878	18,928			148,816
1997	5,018	115,927	43,047		495	159,469
1998	6,419	143,390	57,515			200,905
1999	7,650	109,773	32,073		245	142,091

Table 4. Coverage rate by species for longliners of Korea in the SPC area

Year	Coverage rate			
	Albacore	Bigeye	Yellowfin	Others
1975	0.0291	0.1338	0.0761	0.0714
1976	0.2248	0.1989	0.2349	0.0940
1977	0.3422	0.5018	0.5702	0.2186
1978	0.6102	0.8979	0.7557	0.1880
1979	0.2711	0.4002	0.4189	0.1479
1980	0.6221	0.5903	0.6628	0.3820
1981	0.3700	0.4028	0.3252	0.3660
1982	0.4099	0.4958	0.5077	0.4473
1983	0.6527	0.5663	0.5815	0.5390
1984	0.6707	0.8203	0.7916	0.5590
1985	0.3807	0.8198	0.7020	0.2923
1986	0.2752	0.8123	0.7724	0.3101
1987	0.3860	0.8540	0.8228	0.4604
1988	0.5863	0.8904	0.8912	0.4707
1989	0.3127	0.9959	0.9213	0.5968
1990	0.2339	0.8957	0.8082	0.5035
1991	0.8828	0.9658	0.7956	0.5154
1992	-	0.7605	0.7255	0.4745
1993	-	0.8263	0.7778	0.4758
1994	-	0.4784	0.3147	0.3386
1995	0.8272	0.7567	0.5668	0.6257
1996	0.6930	0.6001	0.5382	0.3262
1997	0.0676	0.1101	0.1386	0.0390
1998	0.6915	0.6291	0.7124	0.699
1999	0.4486	0.2919	0.2486	0.36

- : Impossible to estimate the coverage rate

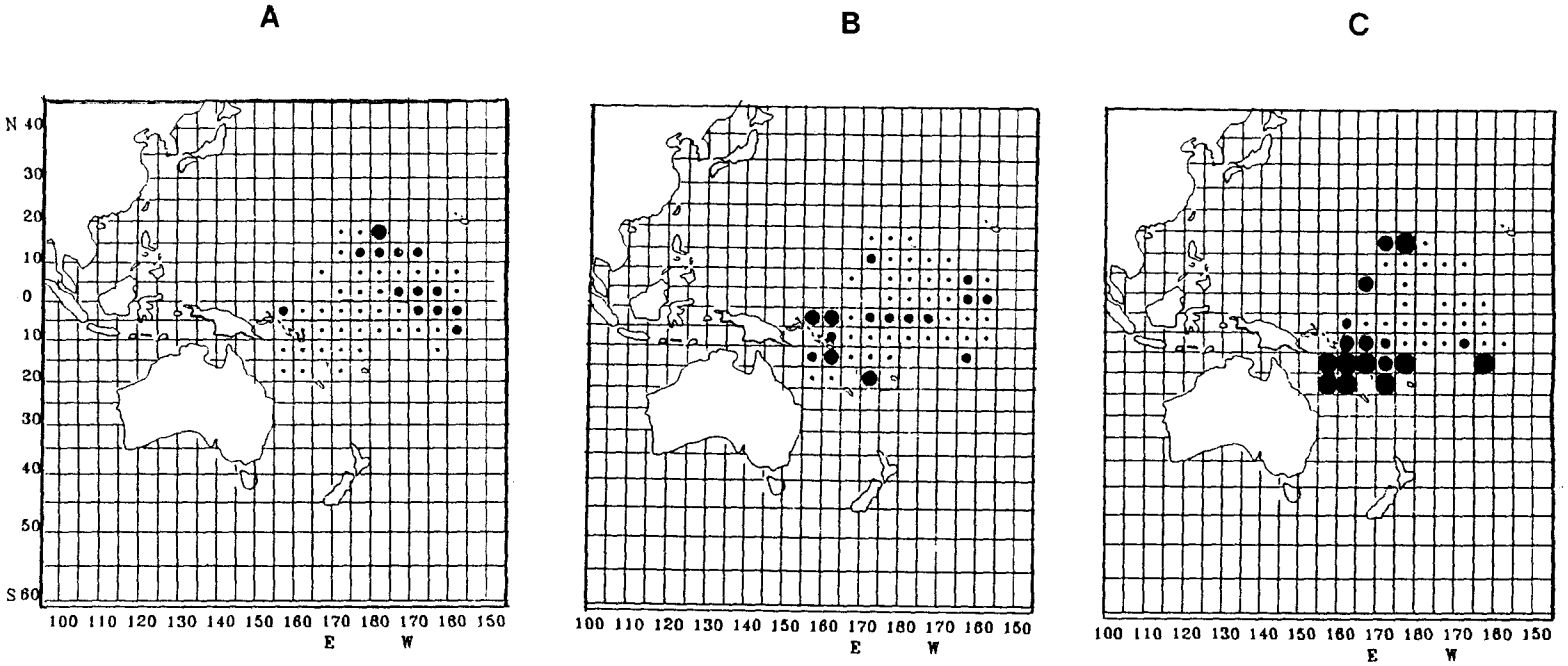
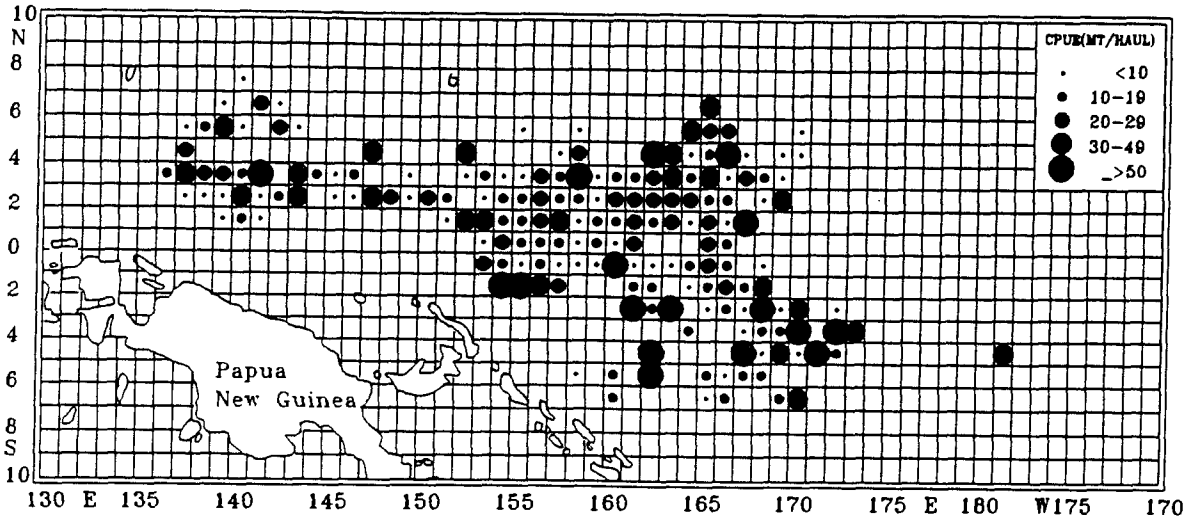


Fig.1 Distribution of CPUE (fish/100 hooks) for Korea tuna longline fishery in the WCPO area,1999 (A: Bigeye, B: Yellowfin, C: Albacore)



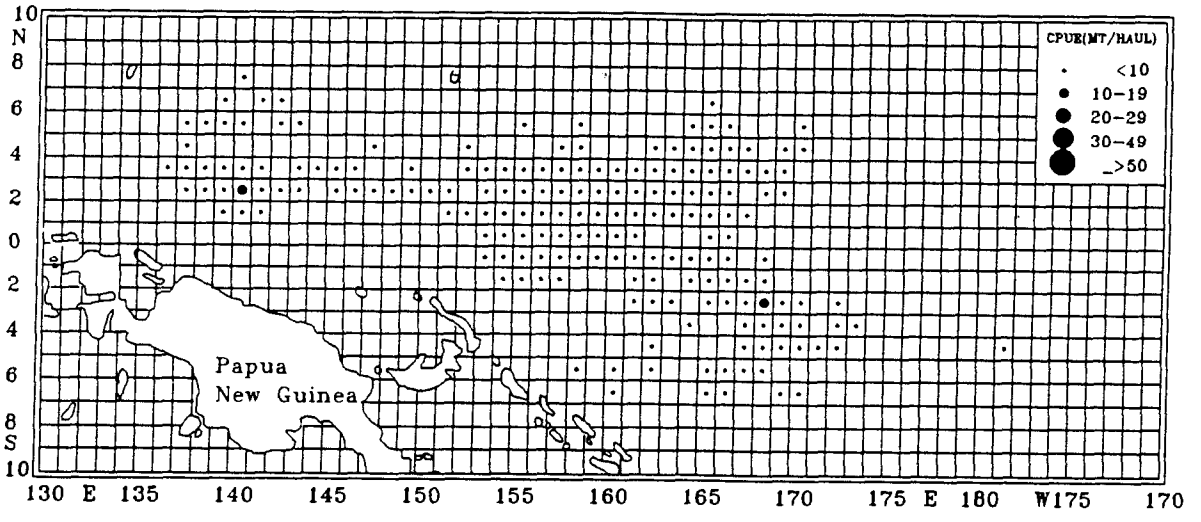


Fig.2 Distribution of CPUE (mt/set) for Korean tuna purse seine fishery in the Pacific, 1999 (Top: Skipjack, Bottom: Yellowfin)