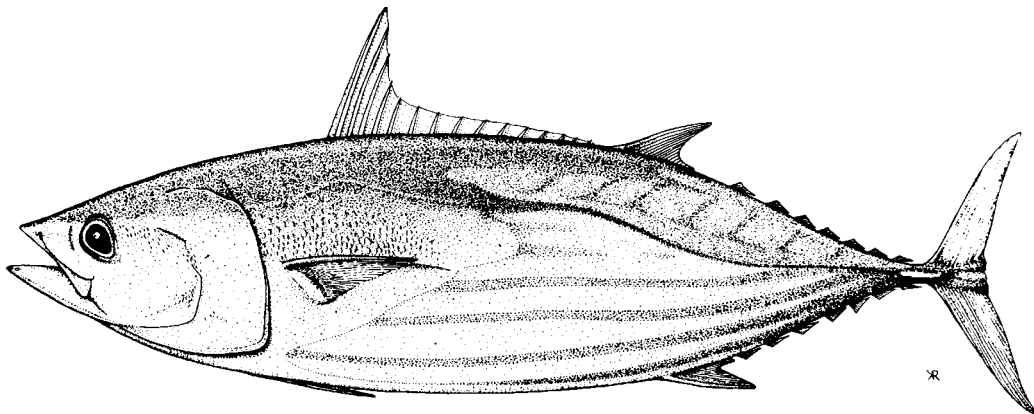


DISTANT-WATER LONGLINE CATCH AND EFFORT
IN THE VICINITY OF PITCAIRN

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INTRODUCTION

This report was prepared in response to a request from the British High Commission, Wellington, New Zealand, dated 30 January 1996, for information regarding the activities of distant-water longline fisheries in the vicinity of Pitcairn. The request was made following the Pitcairn Fisheries Resource Survey, which was carried out from April to June 1994. Pelagic fishing was not included in the terms of reference of the survey; however, an incidental catch of several yellowfin (*Thunnus albacares*) was taken at Ducie and Oeno by trolling, and schools of yellowfin were observed close to the reef around Oeno (Sharples 1994). The British High Commission has expressed an interest in contacting a distant-water fishing nation if the available catch and effort data for the waters of Pitcairn, Henderson, Ducie and Oeno Islands indicated that such a fishery might be commercially viable

The Oceanic Fisheries Programme (OFF) of the South Pacific Commission (SPC) holds catch and effort data, aggregated by 5° longitude by 5° latitude and by month, covering the distant-water longline fisheries of Japan from 1962 to 1993 (Fisheries Agency of Japan, undated, and unpublished data), the Republic of Korea from 1975 to 1992 (National Fisheries Research and Development Agency, 1980, 1981, 1985, 1986, 1988, 1990, 1993), and the Republic of China (Taiwan) from 1967 to 1993 (Tuna Research Center, 1975—1993, and unpublished data). These data were used to document the level of fishing that has taken place in the vicinity of Pitcairn (Figure 1).

Maps of annual fishing effort for each of the three longline fleets are shown in Figures 2—4, and tables of annual catch statistics are presented in Table 1—3. In order to examine the viability of distant-water longlining in the waters of Pitcairn, average catch rates for the three main commercial species caught by distant-water longliners — albacore (*Thunnus alalunga*), bigeye (*Thunnus obesus*) and yellowfin — are compared in Tables 4—6 to catch rates at latitudes within the SPC region at which the three species are targeted.

The maps shown in Figures 2—4 present the level of annual fishing effort in quadrangles of 5° latitude and 5° longitude. The circles which represent the level of effort are scaled such that a circle with a diameter of 5° longitude represents fishing effort of 10 million hooks or more; the area of circles of less than 5° longitude is proportional to the level of effort.

The catch and effort data are aggregated by 5° by 5°; therefore, precise estimates of catch and effort in the waters of the Pitcairn group alone are unavailable. The tables present statistics for “the vicinity of Pitcairn”, which is defined as the area from 20°S to 30°S and from 120°W to 135°W.

Table 4—6, which compare catch rates in the vicinity of Pitcairn to broader areas where each species is targeted, present average catch rates for the period for which data are available, and for the period from 1980 to the most recent year for which data are available. The averages for the broader areas have been determined by including only years for which data are available for the vicinity of Pitcairn.

DISCUSSION

Figure 2 and Table 1 summarise the activities of the Japanese longline fleet. Even before the implementation of Exclusive Economic Zones, fishing effort in the vicinity of Pitcairn was low. Throughout the 1960s, the Japanese fleet targeted primarily albacore, which is a temperate species and thus most commonly fished to the south of 20°S. Fishing effort by the Japanese therefore extended to the south of Pitcairn during the 1960s. During the 1970s, the Japanese fleet switched from targeting albacore to bigeye and yellowfin, which, as tropical species, are usually fished further to the north. By the early 1980s, Pitcairn was well south of the latitudes fished by the Japanese.

During the 1990s, the Japanese have continued to target bigeye and yellowfin, fishing to the north of 15°S.

Figure 3 and Table 2 summarise the activities of the Korean distant-water longline fleet. Historically, fishing effort by the Korean fleet in the vicinity of Pitcairn has also been low. The Korean fleet continued to target albacore until the early 1990s; therefore, the Koreans fished to the south of Pitcairn as late as 1989. Since then, however, the fishery has concentrated further to the north.

Figure 4 and Table 3 summarise the activities of the Taiwanese distant-water longline fleet. While the Japanese and Koreans have switched from albacore to bigeye and yellowfin, the Taiwanese have continued to target albacore. Therefore, fishing effort by the Taiwanese in the vicinity of Pitcairn, while low, has usually been greater than effort by the other fleets. In 1992 and 1993, the Taiwanese took small, though significant, catches of albacore in the vicinity of Pitcairn.

Table 4 compares catch rates for albacore in the vicinity of Pitcairn with those in the area in which albacore are targeted in the SPC region, i.e. from 20°S to 45°S and from 140°E to 110°W. During the periods for which data are available, albacore catch rates in the vicinity of Pitcairn have usually been inferior to average catch rates throughout the broader area. The exception is for the Japanese fleet during 1980—1993, when the albacore catch rate in the vicinity of Pitcairn was 31 per cent greater than that for the broader area. However, fishing effort by the Japanese in the vicinity of Pitcairn has been negligible since 1988; therefore, this result should be interpreted with caution. More importantly, Table 4 shows that for the Taiwanese, the albacore catch rate in the vicinity of Pitcairn has been 66 per cent of the catch rate for the broader area.

Table 5 compares catch rates for bigeye in the vicinity of Pitcairn with those in the area in which bigeye are targeted in the SPC region, i.e. from 15°N to 15°S and from 140°E to 110°W. During the periods for which data are available, bigeye catch rates in the vicinity of Pitcairn have usually been inferior to average catch rates throughout the broader area. Average bigeye catch rates in the vicinity of Pitcairn, from 1980 to the most recent year for which data are available, have been 47 per cent and 17 per cent of bigeye catch rates in the broader area, for the Japanese and the Korean fleets, respectively.

Table 6 compares catch rates for yellowfin in the vicinity of Pitcairn with those in the area in which yellowfin are targeted in the SPC region, i.e. from 15°N to 15°S and from 140°E to 110°W. The situation is similar to that for bigeye. However, average yellowfin catch rates in the vicinity of Pitcairn, from 1980 to the most recent year for which data are available, have represented an even smaller proportion of the yellowfin catch rate in the broader area, 36 per cent and 14 per cent for the Japanese and the Korean fleets, respectively.

CONCLUSION

Fishing effort in the vicinity of Pitcairn has been low, for reasons which are made clear in Tables 4-6. Catch rates for bigeye and yellowfin in the waters of the Pitcairn group are too low to be of interest to the Japanese and Korean fleets, which target those species further to the north.

Catch rates for albacore are also low compared to other areas. While albacore catch rates in the vicinity of Pitcairn could be considered moderate, averaging 2.40 fish per 100 hooks during 1980—1993, they would probably not be considered commercially viable. In any case, it is unlikely that a distant-water fishing nation would consider paying for access to Pitcairn for albacore fishing, given

the large area of high seas to the immediate south, where albacore catch rates are higher and where access is free.

This report has only considered the three target species — albacore, bigeye and yellowfin — whereas distant-water longliners take many other species as by-catch. For example, it has been reported that good catches of wahoo (*Acanthocybium solandri*) have been taken in the vicinity of Pitcairn; however, due to lack of data for this species, no further comment can be made.

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Figure 1. SPC statistical area

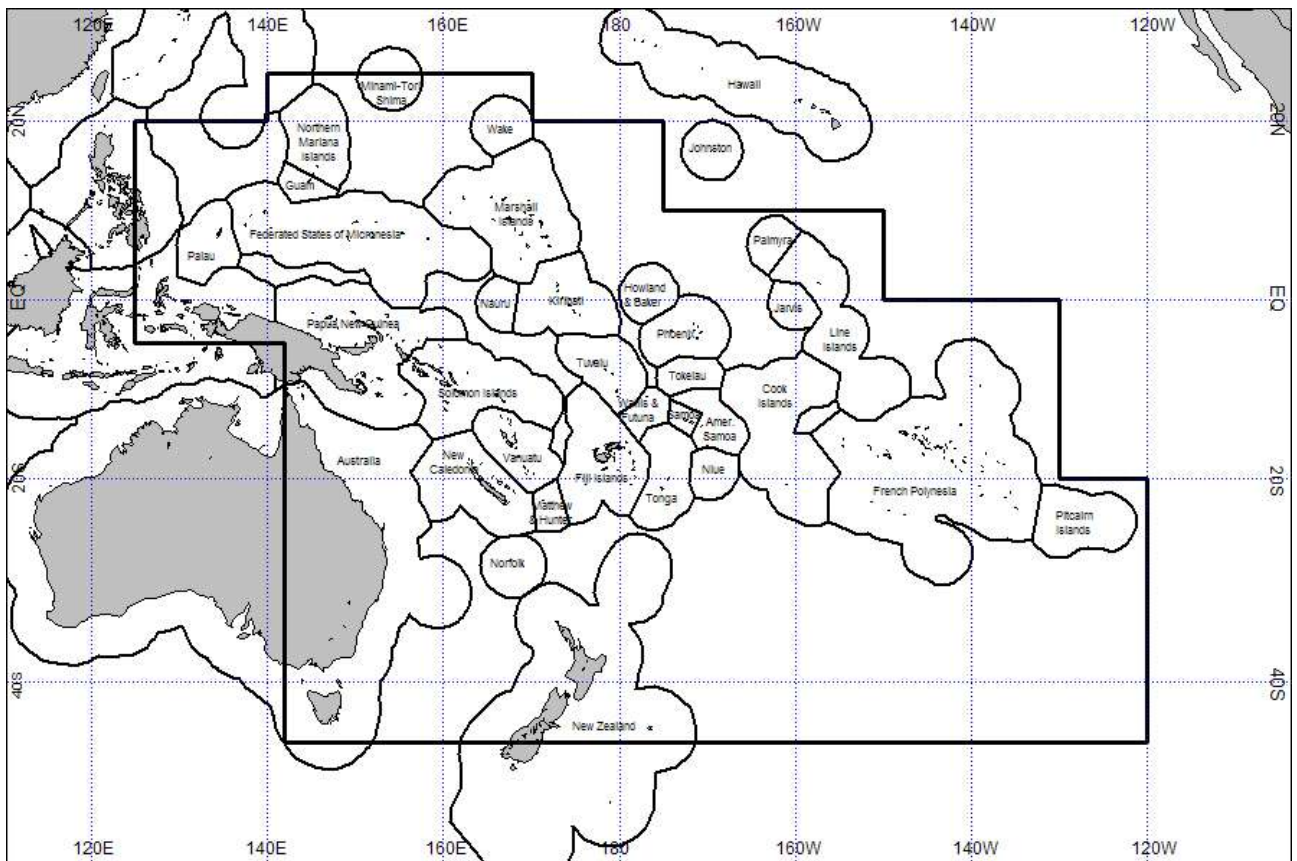


Figure 2. Japanese longline effort

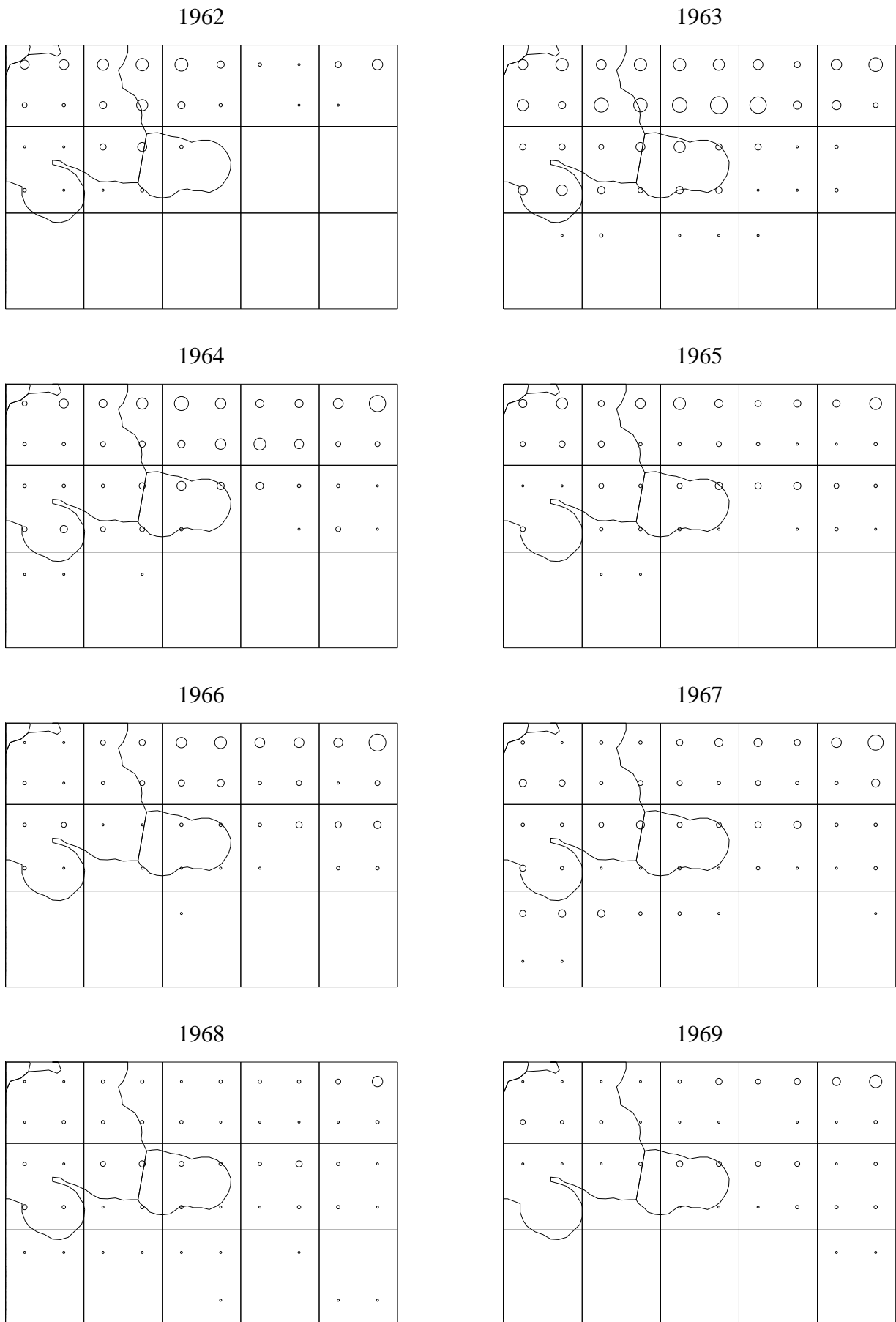


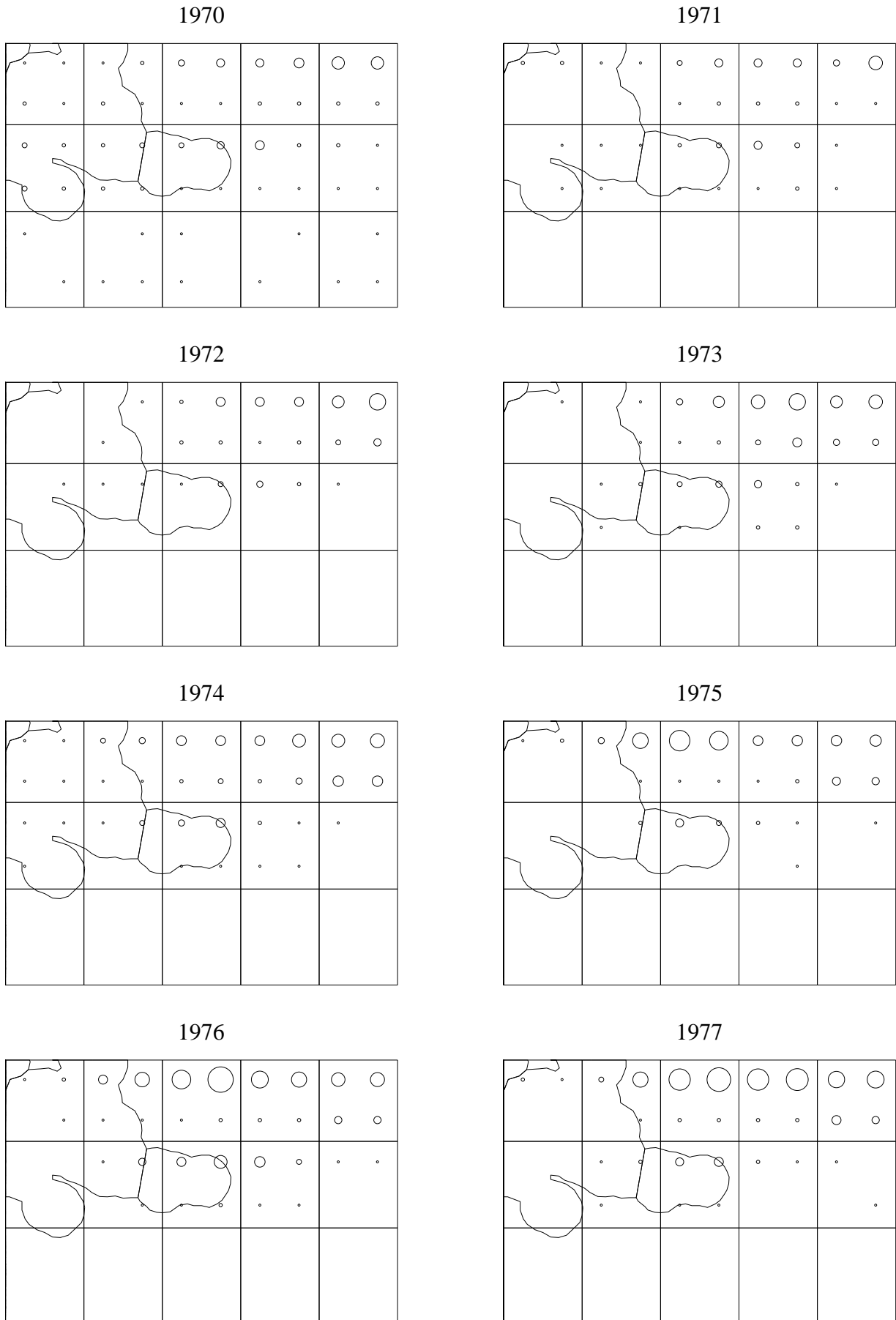
Figure 2. Japanese longline effort, continued

Figure 2. Japanese longline effort, continued

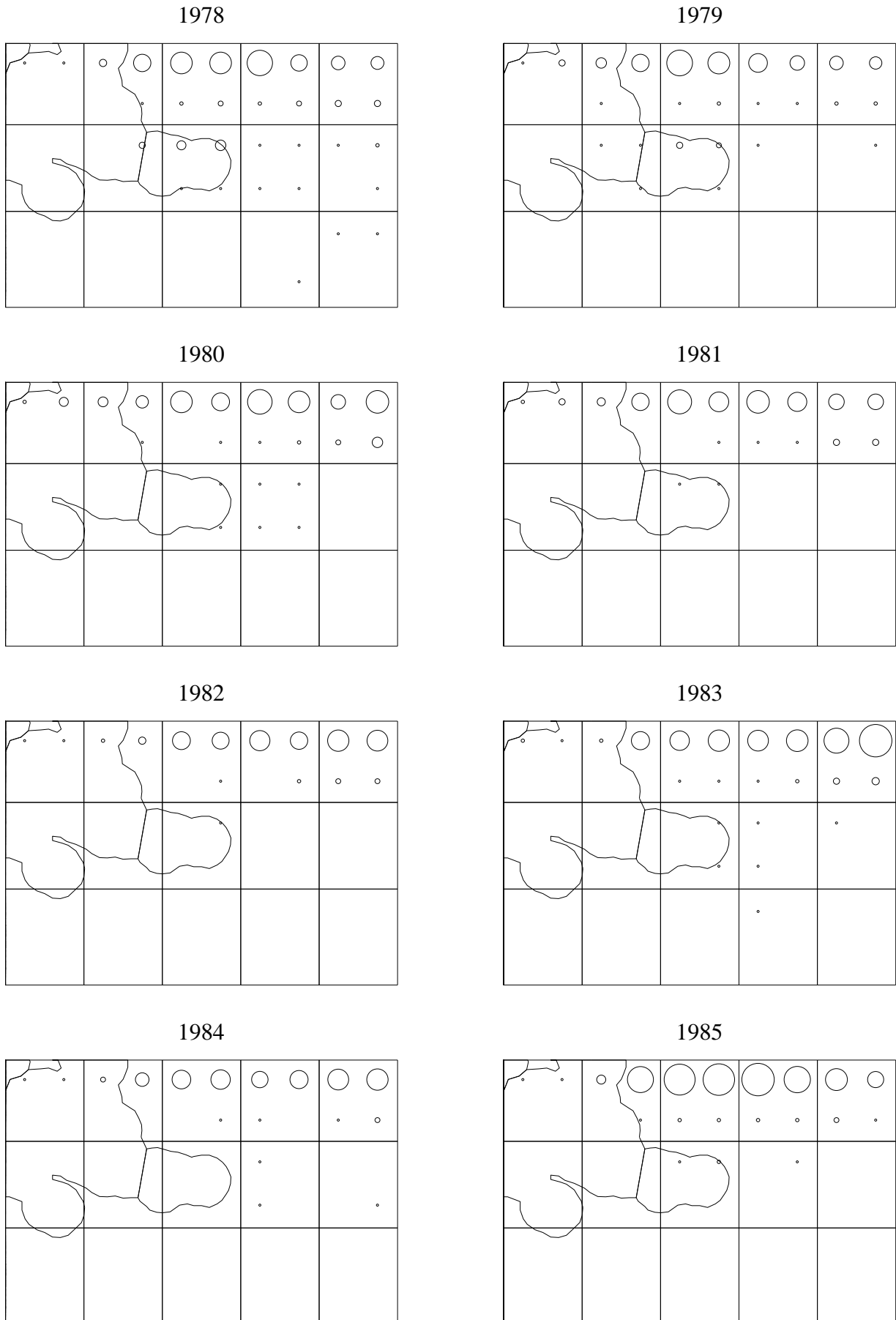


Figure 2. Japanese longline effort, continued

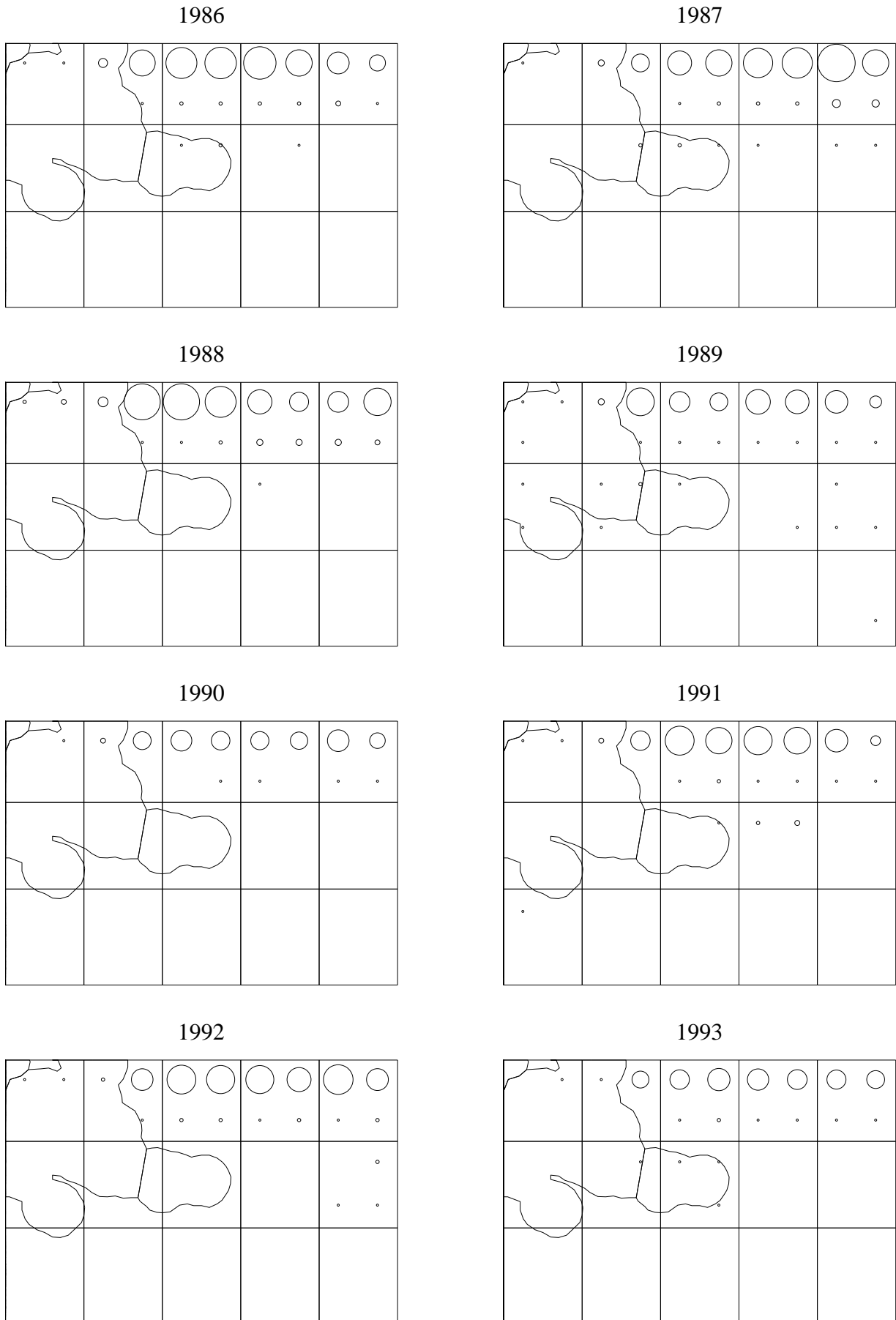


Figure 3. Korean longline effort

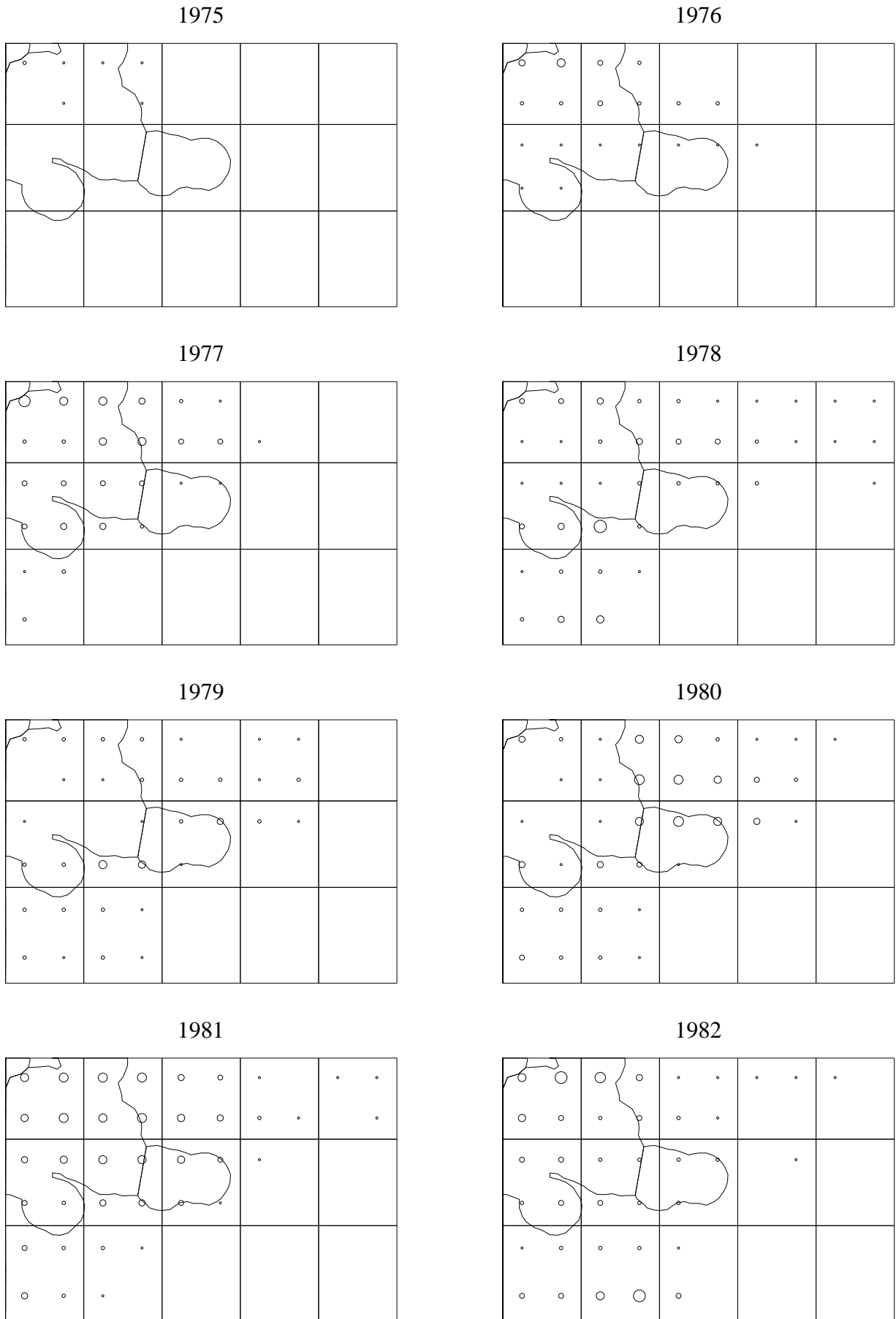


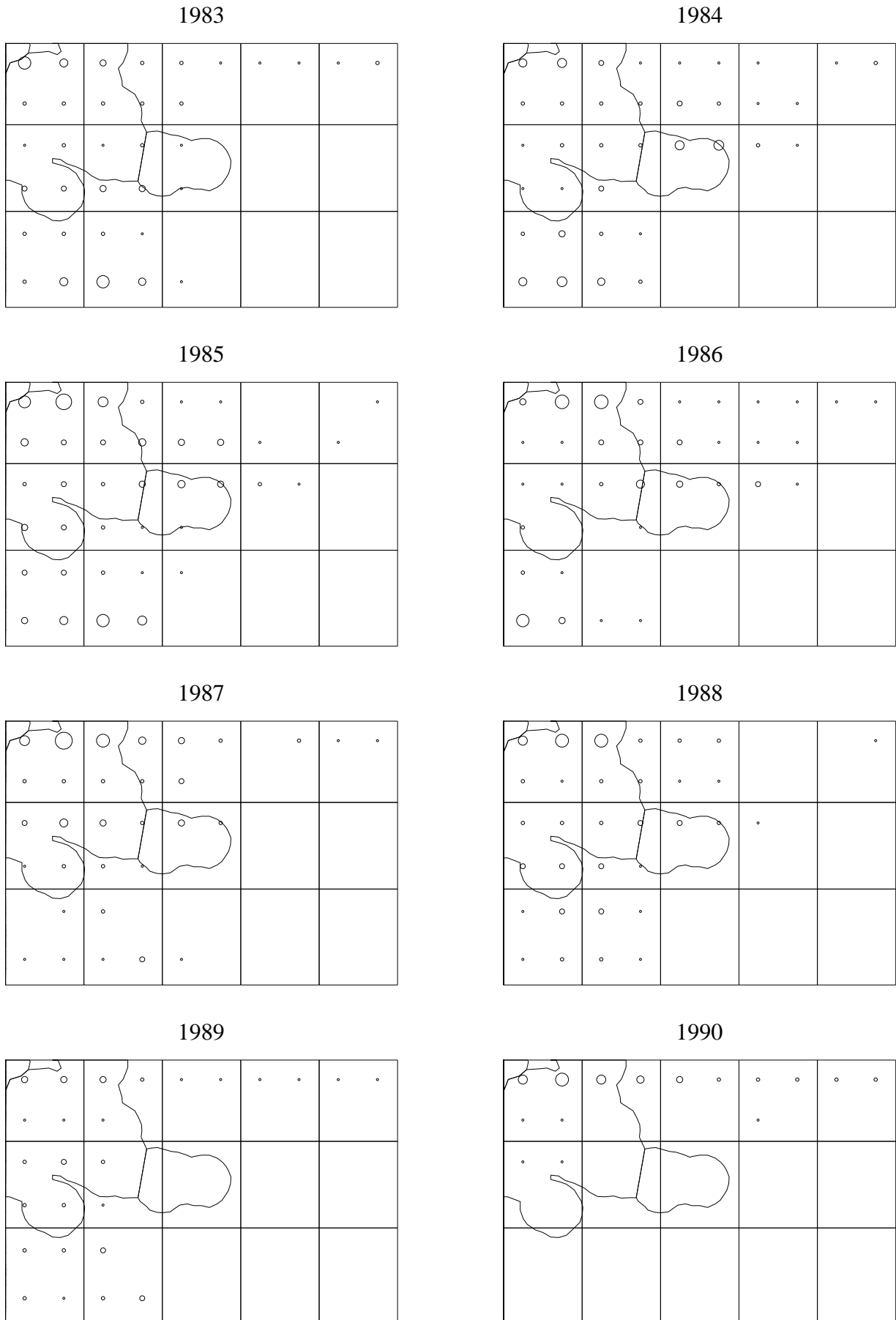
Figure 3. Korean longline effort, continued

Figure 4. Taiwanese longline effort

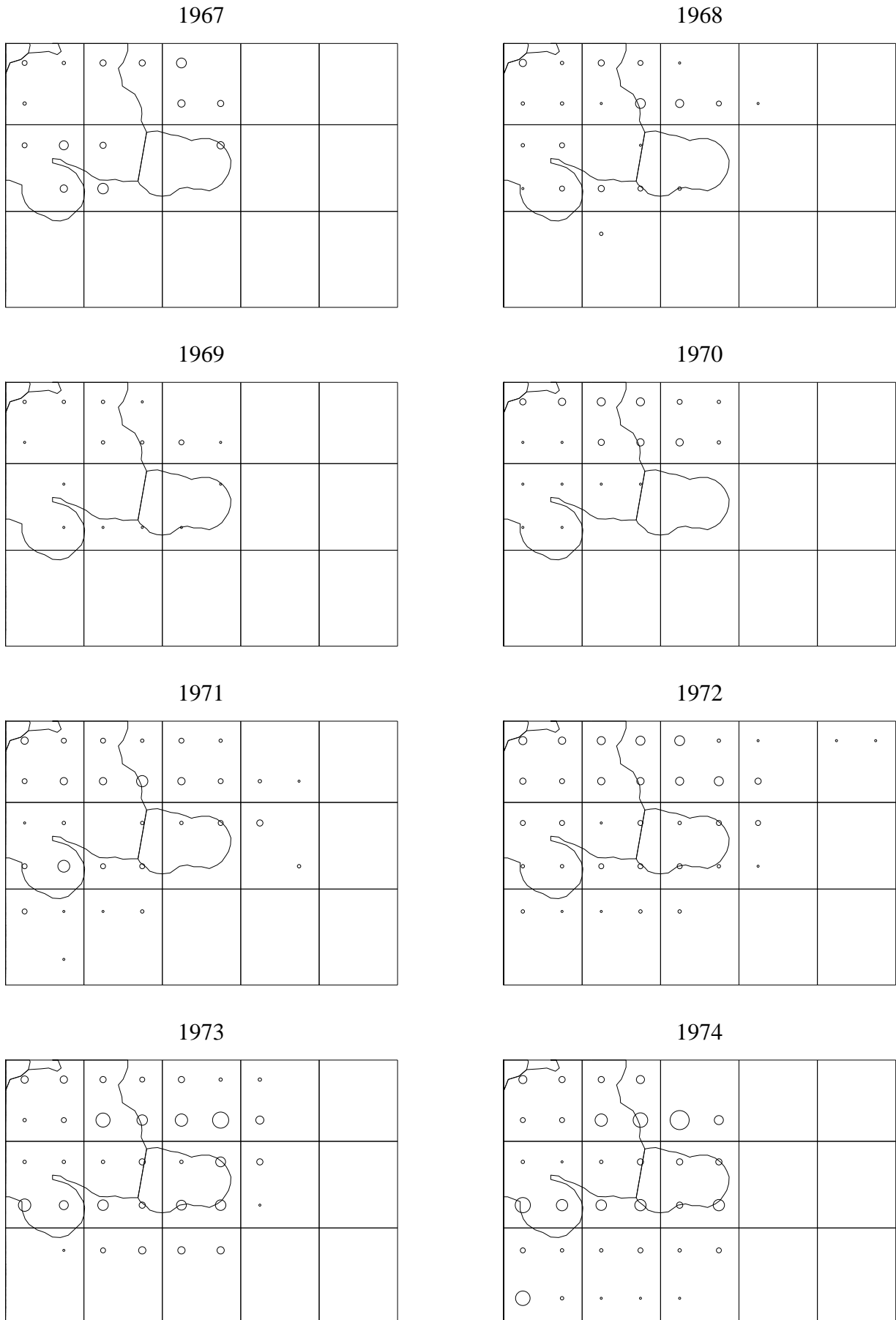


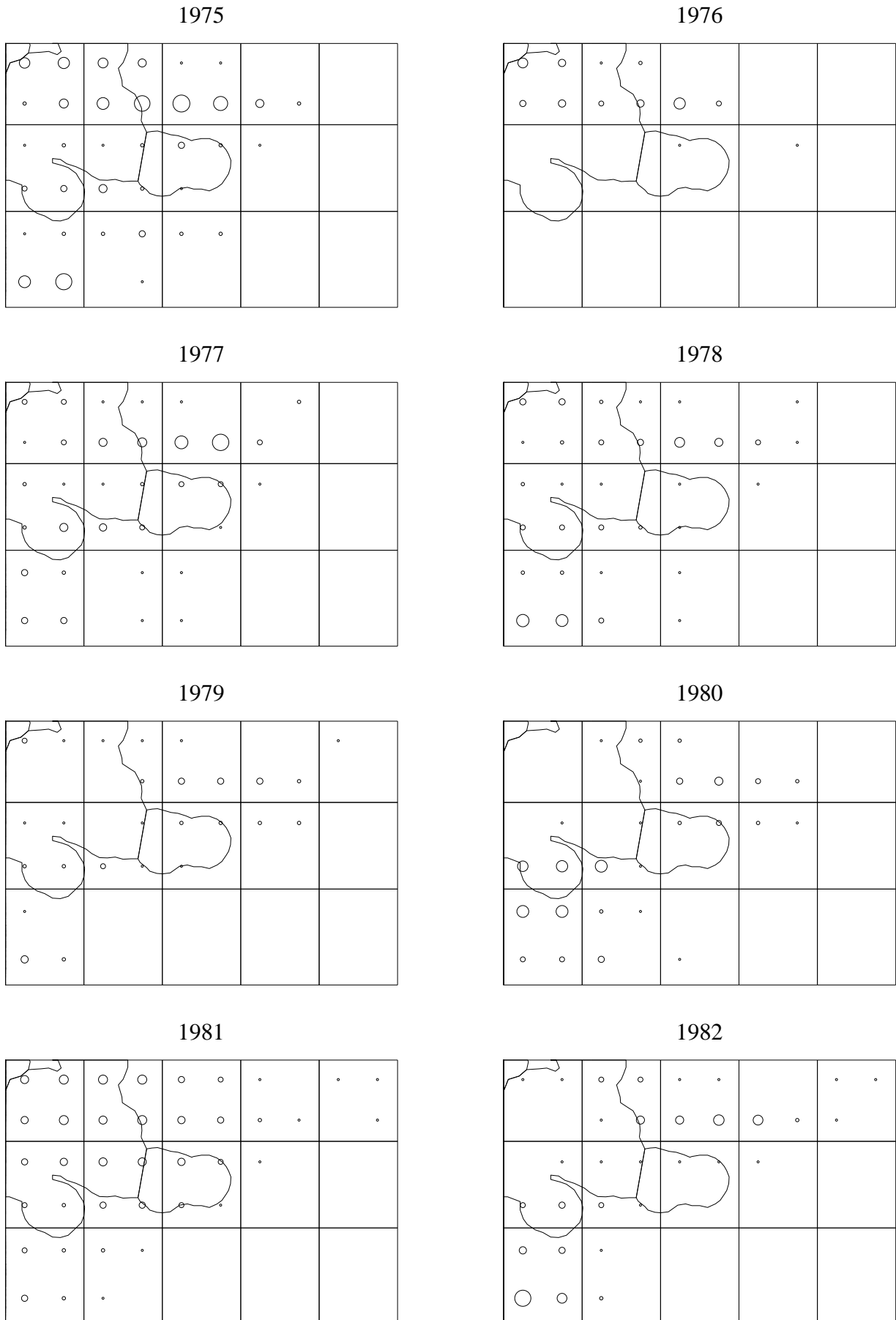
Figure 4. Taiwanese longline effort, continued

Figure 4. Taiwanese longline effort, continued

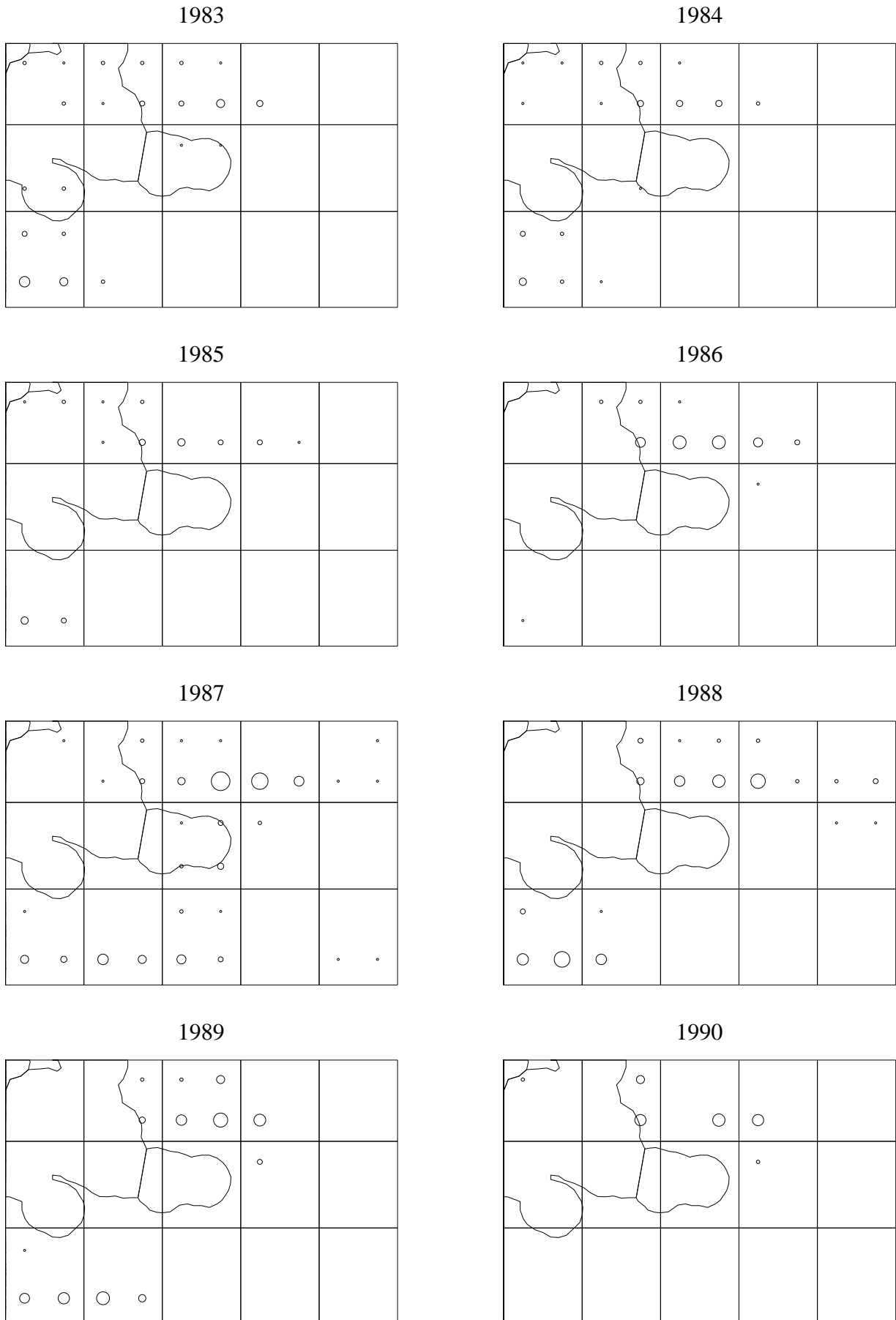


Figure 4. Taiwanese longline effort, continued

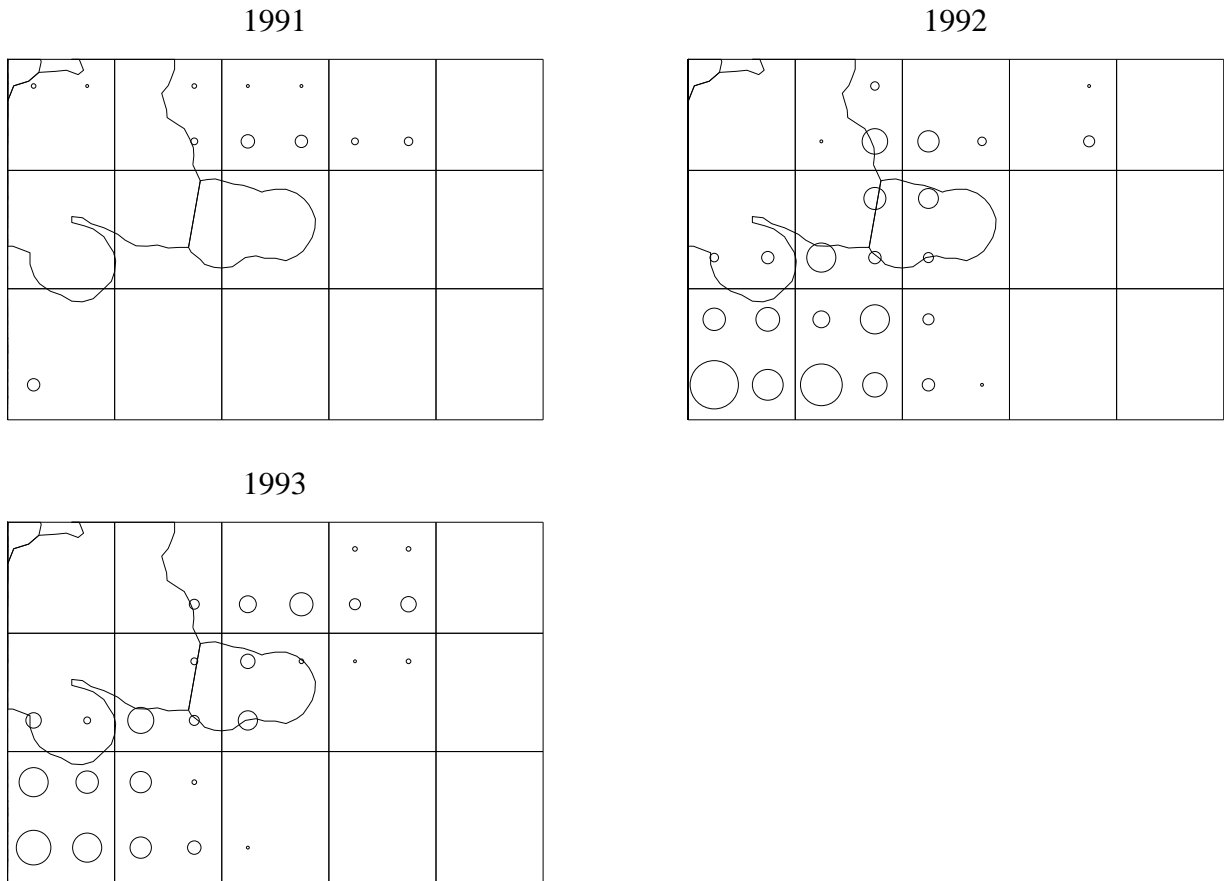


Table 1. Catch (metric tonnes), effort (thousand hooks) and catch per unit effort (number of fish per 100 hooks) by Japanese distant-water longliners in the vicinity of Pitcairn

YEAR	HOOKS	ALBACORE		BIGEYE		YELLOWFIN		TOTAL	
		CATCH	CPUE	CATCH	CPUE	CATCH	CPUE	CATCH	CPUE
1962	701	280	3.06	79	0.36	97	0.54	687	4.65
1963	2,507	973	2.96	165	0.21	108	0.17	1,980	4.04
1964	1,565	388	1.90	243	0.50	133	0.33	1,217	3.24
1965	836	139	1.27	98	0.37	109	0.51	684	2.85
1966	239	42	1.37	22	0.30	16	0.26	160	2.49
1967	1,027	243	1.81	127	0.40	55	0.21	730	2.95
1968	737	125	1.30	82	0.35	59	0.31	454	2.46
1969	516	24	0.36	86	0.54	23	0.17	288	1.55
1970	819	99	0.92	115	0.45	58	0.28	550	2.22
1971	313	22	0.53	77	0.79	15	0.19	227	2.15
1972	272	9	0.26	49	0.58	13	0.19	211	1.89
1973	566	18	0.25	127	0.72	23	0.16	324	1.57
1974	1,107	34	0.24	207	0.60	29	0.10	544	1.35
1975	729	31	0.32	158	0.69	18	0.09	452	1.66
1976	2,364	113	0.36	404	0.55	103	0.17	1,660	1.79
1977	1,301	112	0.65	193	0.47	28	0.08	710	1.70
1978	1,666	185	0.85	258	0.49	78	0.18	828	1.84
1979	531	58	0.84	99	0.60	29	0.21	271	1.93
1980	11	0	0.53	0	0.21	1	0.36	3	1.19
1981	70	9	0.98	5	0.23	1	0.09	29	1.80
1982	27	4	1.13	3	0.44	2	0.41	15	2.23
1983	50	4	0.68	4	0.28	2	0.21	23	1.55
1984	-	-	-	-	-	-	-	-	-
1985	138	9	0.53	18	0.43	7	0.21	86	1.75
1986	112	9	0.67	16	0.46	4	0.15	83	1.97
1987	209	17	0.65	25	0.39	5	0.10	121	1.68
1988	-	-	-	-	-	-	-	-	-
1989	87	10	0.90	13	0.49	21	0.97	48	2.47
1990	-	-	-	-	-	-	-	-	-
1991	16	2	1.33	0	0.19	0	0.16	9	2.35
1992	-	-	-	-	-	-	-	-	-
1993	9	18	2.93	3	0.22	0	0.06	28	3.44

Table 2. Catch (metric tonnes), effort (thousand hooks) and catch per unit effort (number of fish per 100 hooks) by Korean distant-water longliners in the vicinity of Pitcairn

YEAR	HOOKS	ALBACORE		BIGEYE		YELLOWFIN		TOTAL	
		CATCH	CPUE	CATCH	CPUE	CATCH	CPUE	CATCH	CPUE
1975	-	-	-	-	-	-	-	-	-
1976	96	49	2.76	12	0.41	2	0.09	70	3.44
1977	374	125	2.34	19	0.16	3	0.04	152	2.57
1978	328	87	1.75	52	0.51	6	0.07	176	2.50
1979	788	283	2.47	27	0.11	31	0.15	419	2.99
1980	1,800	518	1.66	85	0.15	245	0.53	877	2.41
1981	1,598	301	1.44	43	0.08	25	0.06	487	1.80
1982	424	60	1.09	14	0.10	10	0.09	107	1.47
1983	410	92	1.51	9	0.07	3	0.03	112	1.68
1984	1,359	267	1.47	62	0.14	34	0.09	475	1.94
1985	978	214	1.69	31	0.10	18	0.07	344	2.08
1986	833	192	1.73	16	0.06	16	0.07	297	2.10
1987	612	126	1.32	24	0.12	5	0.03	232	1.78
1988	605	165	2.09	3	0.01	1	0.00	204	2.24
1989	-	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-
1992	71	18	2.03	3	0.16	1	0.06	34	2.52

Table 3. Catch (metric tonnes), effort (thousand hooks) and catch per unit effort (number of fish per 100 hooks) by Taiwanese distant-water longliners in the vicinity of Pitcairn

YEAR	HOOKS	ALBACORE		BIGEYE		YELLOWFIN		TOTAL	
		CATCH	CPUE	CATCH	CPUE	CATCH	CPUE	CATCH	CPUE
1967	412	584	6.37	64	0.43	3	0.03	705	7.17
1968	273	262	4.96	10	0.10	4	0.06	302	5.46
1969	34	15	1.81	4	0.32	1	0.12	29	3.01
1970	4	1	1.62	0	0.13	0	0.00	1	1.76
1971	671	591	4.90	40	0.13	9	0.04	688	5.20
1972	968	630	3.57	52	0.13	16	0.05	778	3.91
1973	2,865	1,527	2.86	323	0.27	27	0.03	2,018	3.27
1974	2,976	1,493	2.89	67	0.07	66	0.08	1,733	3.10
1975	631	260	2.47	20	0.11	3	0.01	310	2.69
1976	19	12	3.23	0	0.07	0	0.00	12	3.38
1977	625	462	3.97	22	0.10	4	0.03	622	4.19
1978	173	138	5.27	3	0.05	4	0.14	149	5.52
1979	235	173	3.77	14	0.19	8	0.12	209	4.15
1980	377	208	3.09	10	0.11	2	0.02	230	3.29
1981	439	185	2.19	8	0.05	2	0.01	217	2.43
1982	85	33	2.23	0	0.02	0	0.02	36	2.37
1983	47	30	3.30	3	0.16	1	0.05	35	3.54
1984	10	4	2.40	0	0.10	0	0.07	6	2.71
1985	-	-	-	-	-	-	-	-	-
1986	-	-	-	-	-	-	-	-	-
1987	698	244	2.18	6	0.03	1	0.00	263	2.28
1988	-	-	-	-	-	-	-	-	-
1989	-	-	-	-	-	-	-	-	-
1990	-	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-
1992	4,370	1,489	2.04	0	0.00	0	0.00	1,507	2.05
1993	2,855	754	1.74	7	0.00	14	0.02	801	1.78

Table 4. Albacore catch rates (number of fish per 100 hooks) for distant-water longline fleets in the vicinity of Pitcairn, compared to the area from 20°S to 45°S and from 140°E to 110°W

YEAR	JAPAN			KOREA			TAIWAN		
	PITCAIRN	20S-45S	%	PITCAIRN	20S-45S	%	PITCAIRN	20S-45S	%
1962	3.06	3.27	94						
1963	2.96	2.25	132						
1964	1.90	2.43	78						
1965	1.27	2.28	56						
1966	1.37	2.54	54						
1967	1.81	2.58	70				6.37	7.07	90
1968	1.30	1.55	84				4.96	6.18	80
1969	0.36	1.01	36				1.81	7.60	24
1970	0.92	1.23	75				1.62	6.18	26
1971	0.53	0.79	67				4.90	6.13	80
1972	0.26	0.55	47				3.57	5.85	61
1973	0.25	0.69	36				2.86	4.66	61
1974	0.24	0.48	50				2.89	3.62	80
1975	0.32	0.49	65	-	1.51	-	2.47	4.25	58
1976	0.36	0.37	97	2.76	2.28	121	3.23	4.73	68
1977	0.65	0.44	148	2.34	1.86	126	3.97	5.76	69
1978	0.85	0.48	177	1.75	3.52	50	5.27	6.11	86
1979	0.84	0.44	191	2.47	2.81	88	3.77	4.38	86
1980	0.53	0.27	196	1.66	2.10	79	3.09	4.07	76
1981	0.98	0.45	218	1.44	1.83	79	2.19	3.37	65
1982	1.13	0.57	198	1.09	2.71	40	2.23	3.48	64
1983	0.68	0.78	87	1.51	2.79	54	3.30	4.49	73
1984	-	0.71	-	1.47	2.38	62	2.40	3.16	76
1985	0.53	0.99	54	1.69	3.05	55	-	3.98	-
1986	0.67	0.99	68	1.73	3.84	45	-	6.21	-
1987	0.65	0.85	76	1.32	2.33	57	2.18	3.82	57
1988	-	0.86	-	2.09	2.29	91	-	3.63	-
1989	0.90	0.85	106	-	1.52	-	-	2.23	-
1990	-	0.92	-	-	1.01	-	-	1.83	-
1991	1.33	0.89	149	-	-	-	-	2.65	-
1992	-	1.02	-	2.03	2.03	100	2.04	3.10	66
1993	2.93	1.26	233				1.74	3.19	55
AVE	1.06	1.13	93	1.81	2.56	71	3.18	4.82	66
80-93	1.03	0.79	131	1.60	2.54	63	2.40	3.59	67

Table 5. Bigeye catch rates (number of fish per 100 hooks) for distant-water longline fleets in the vicinity of Pitcairn, compared to the area from 15°N to 15°S and from 140°E to 110°W

YEAR	JAPAN			KOREA			TAIWAN		
	PITCAIRN	15N-15S	%	PITCAIRN	15N-15S	%	PITCAIRN	15N-15S	%
1962	0.36	1.01	36						
1963	0.21	0.99	21						
1964	0.50	0.87	57						
1965	0.37	0.77	48						
1966	0.30	0.68	44						
1967	0.40	0.77	52				0.43	0.44	98
1968	0.35	0.68	51				0.10	0.33	30
1969	0.54	0.85	64				0.32	0.24	133
1970	0.45	0.71	63				0.13	0.45	29
1971	0.79	0.68	116				0.13	0.27	48
1972	0.58	0.81	72				0.13	0.37	35
1973	0.72	0.71	101				0.27	0.30	90
1974	0.60	0.69	87				0.07	0.40	18
1975	0.69	0.73	95	-	0.71	-	0.11	0.22	50
1976	0.55	0.78	71	0.41	0.69	59	0.07	0.18	39
1977	0.47	0.84	56	0.16	0.75	21	0.10	0.14	71
1978	0.49	0.73	67	0.51	0.73	70	0.05	0.16	31
1979	0.60	0.77	78	0.11	0.59	19	0.19	0.20	95
1980	0.21	0.68	31	0.15	0.43	35	0.11	0.20	55
1981	0.23	0.54	43	0.08	0.37	22	0.05	0.17	29
1982	0.44	0.66	67	0.10	0.44	23	0.02	0.09	22
1983	0.28	0.73	38	0.07	0.58	12	0.16	0.09	178
1984	-	0.69	-	0.14	0.57	25	0.10	0.08	125
1985	0.43	0.84	51	0.10	0.65	15	-	0.10	-
1986	0.46	0.89	52	0.06	0.67	9	-	0.07	-
1987	0.39	0.86	45	0.12	0.73	16	0.03	0.11	27
1988	-	0.65	-	0.01	0.51	2	-	0.05	-
1989	0.49	0.64	77	-	0.44	-	-	0.13	-
1990	-	0.78	-	-	0.67	-	-	0.11	-
1991	0.19	0.70	27	-	0.71	-	-	0.10	-
1992	-	0.71	-	0.16	0.75	21	0.00	2.58	0
1993	0.22	0.63	35				0.00	0.03	0
AVE	0.44	0.76	58	0.16	0.60	26	0.12	0.34	36
80-93	0.33	0.72	47	0.10	0.57	17	0.06	0.42	14

Table 6. Yellowfin catch rates (number of fish per 100 hooks) for distant-water longline fleets in the vicinity of Pitcairn, compared to the area from 15°N to 15°S and from 140°E to 110°W

YEAR	JAPAN			KOREA			TAIWAN		
	PITCAIRN	15N-15S	%	PITCAIRN	15N-15S	%	PITCAIRN	15N-15S	%
1962	0.54	1.33	41						
1963	0.17	1.27	13						
1964	0.33	1.32	25						
1965	0.51	1.23	41						
1966	0.26	1.65	16						
1967	0.21	1.00	21				0.03	0.65	5
1968	0.31	1.27	24				0.06	1.12	5
1969	0.17	1.21	14				0.12	1.46	8
1970	0.28	1.09	26				0.00	0.76	0
1971	0.19	0.93	20				0.04	1.82	2
1972	0.19	0.91	21				0.05	1.37	4
1973	0.16	0.88	18				0.03	1.15	3
1974	0.10	0.54	19				0.08	0.86	9
1975	0.09	0.59	15	-	0.38	-	0.01	0.52	2
1976	0.17	0.67	25	0.09	0.73	12	0.00	0.59	0
1977	0.08	0.95	8	0.04	0.99	4	0.03	0.44	7
1978	0.18	1.22	15	0.07	1.27	6	0.14	0.71	20
1979	0.21	0.87	24	0.15	1.14	13	0.12	0.79	15
1980	0.36	1.09	33	0.53	0.96	55	0.02	0.80	3
1981	0.09	0.88	10	0.06	0.51	12	0.01	0.39	3
1982	0.41	0.92	45	0.09	0.69	13	0.02	0.24	8
1983	0.21	1.16	18	0.03	0.97	3	0.05	0.28	18
1984	-	0.80	-	0.09	0.72	13	0.07	0.21	33
1985	0.21	0.77	27	0.07	0.73	10	-	0.29	-
1986	0.15	0.66	23	0.07	0.76	9	-	0.23	-
1987	0.10	0.54	19	0.03	0.60	5	0.00	0.22	0
1988	-	0.51	-	0.00	0.58	0	-	0.40	-
1989	0.97	0.50	194	-	0.48	-	-	0.19	-
1990	-	0.59	-	-	0.57	-	-	0.22	-
1991	0.16	0.47	34	-	0.45	-	-	0.15	-
1992	-	0.48	-	0.06	0.70	9	0.00	1.50	0
1993	0.06	0.51	12				0.02	0.12	17
AVE	0.25	0.94	26	0.10	0.81	12	0.04	0.76	6
80-93	0.27	0.75	36	0.10	0.72	14	0.02	0.47	5