

## STATUS OF TAIWANESE LONGLINE FISHERIES IN THE ATLANTIC

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### SUMMARY

In 1990, the Taiwanese longline fishery changed its fishing strategy by using regular longline in temperate areas and deep longline in tropical areas of the Atlantic. The 1990 yearly catch is estimated to be about 34,304 MT, which is about 7,256 MT from the North Atlantic and 27,048 MT from the South Atlantic.

The regular longline is targeting albacore, and the deep longline is targeting bigeye and yellowfin. Most Taiwanese regular longline effort was conducted in the South Atlantic; in contrast, deep longline was used in the North Atlantic. As a result, the three dominant species in the 1990 catches are bigeye (2,803 MT), yellowfin (2,017 MT) and albacore (1,512 MT) in the North Atlantic; and albacore (22,129 MT), bigeye (2,096 MT) and yellowfin (998 MT) in the South Atlantic.

All of these detailed catch statistics are regularly submitted to ICCAT. Research is carried out only on albacore, and no intensive research is currently in progress for other species due to limited manpower.

### RESUME

En 1990, la pêche palangrière taiwanaise a modifié sa stratégie de pêche par l'utilisation de la palangre ordinaire dans les eaux tempérées et de la palangre de profondeur dans les zones tropicales de l'Atlantique. La prise annuelle de 1990 s'élève à environ 34.304 TM, soit 7.256 TM en provenance de l'Atlantique nord et 27.048 TM de l'Atlantique sud.

La palangre ordinaire vise le germon et la palangre de profondeur le thon obèse et l'albacore. La plus grande partie de l'effort palangrier ordinaire a été déployé dans l'Atlantique sud; par contre, la palangre de profondeur a été utilisée dans l'Atlantique nord. De ce fait, les trois espèces prédominantes dans la prise de 1990 sont le thon obèse (2.803 TM), l'albacore (2.017 TM) et le germon (1.512 TM) dans l'Atlantique nord, et le germon (22.129 TM), thon obèse (2.096 TM) et l'albacore (998 TM) dans l'Atlantique sud.

Toutes les statistiques détaillées de capture sont remises régulièrement à l'ICCAT. La recherche ne porte que sur le germon et aucun programme intensif de recherche n'est en cours actuellement pour aucune espèce par manque de personnel.

### RESUMEN

En 1990, la pesquería de palangre de Taiwan cambió su estrategia de pesca, empleando palangre regular en aguas templadas, y palangre profundo en aguas tropicales del Atlántico. La captura anual para 1990 se estima en unas 34.304 t, de las cuales aproximadamente 7.256 t corresponden al Atlántico norte y 27.048 t al Atlántico sur.

En Taiwan, el palangre regular persigue atún blanco, y el de profundidad, patudo y rabil. La mayor parte del esfuerzo con palangre regular se llevó a cabo en el Atlántico sur; en cambio, el palangre profundo se empleó en el Atlántico norte. Las tres especies dominantes en la captura de 1990 son: patudo (2.803 t), rabil (2.017 t), y atún blanco (1.512 t) en el Atlántico norte. Atún blanco (22.129 t), patudo (2.096 t) y rabil (998 t) en el Atlántico sur.

Todas las estadísticas detalladas de captura se presentan regularmente a ICCAT. Se efectúa investigación sólo sobre el atún blanco, y actualmente no se está llevando a cabo investigación intensiva sobre otras especies, debido a limitación de personal.

### 1. FISHING ACTIVITIES

In 1990, Taiwanese longline fisheries operated in the Atlantic Ocean has been confirmed in using two types of fishing pattern: regular longline and deep longline methods. The vessels of the latter is probably traditional fishing in Indian Ocean and the former is the traditional one operated in the Atlantic.

The Taiwanese longline vessels classified by different patterns in operation are shown in monthly sustainable numbers in Table 1. Also as shown in Table 2, The 1990 yearly catch including all species is estimated to 34,304 metric tones (MT) with 99,798 thousand nominal hooks, which is about 7,256 MT with 17,412 thousand nominal hooks from

northern Atlantic, and 27,048 MT with 82,386 thousand nominal hooks from southern Atlantic.

The three main species of 1990 catches in the north Atlantic are bigeye tuna (2,803 MT), Yellowfin tuna (2,017 MT), and albacore (1,512 MT) in order; and in the south Atlantic are in the order of albacore (22,129 MT), bigeye tuna (2,096 MT) and yellowfin tuna (998 MT).

#### 1.1 Regular longline fishery

The longline vessels operated in regular fishing pattern have declined their efforts to about 3,760 thousand nominal hooks in 1989 since 1987 in the north Atlantic, but an increase is occurred to  $7,433 \times 10^3$  nominal hooks in 1990. Those vessels conventionally target on albacore. In 1990, the catch of albacore continues its decreasing tendency from 1987 owing to possibly the economic reason, but albacore still sustains the highest amount (1,399 MT) of catch from north Atlantic by Taiwanese vessels operated in regular fishing pattern. And, bigeye tuna (715 MT) and yellowfin tuna (235 MT) are occupied the second and third positions of the regular longline catches in the north Atlantic, respectively.

In 1990 most of the efforts of Taiwanese regular longline vessels are set in the south Atlantic, there are comparatively 10 times efforts (74,878 thousand nominal hooks) greater than those of the north Atlantic. Comparatively, the 1990 regular longline efforts is with a slight increasing from  $68687 \times 10^3$  nominal hooks in 1989. The catch of albacore is about 21,612 MT as the target of regular longline fishing, and similarly in the first rank hereinbefore. And bigeye tuna (1,324 MT) and yellowfin tuna (about 655 MT) are ranked in the second and third positions, respectively (Table 2).

The distributions of nominal catch per unit effort of albacore, bigeye tuna and yellowfin tuna are shown in Figs. 1, 2 and 3, respectively.

#### 1.2 Deep longline fishery

The vessels operated in the deep fishing pattern with an about  $-65^{\circ}\text{C}$  freezing storage chamber are not new fishing pattern in the Indian Ocean, but are recently introduced in the Atlantic in 1990 (possibly in 1989 but only one record had been reported). This fishing vessels are targeted on bigeye tuna and yellowfin tuna almost in the tropical Atlantic which is similar to the tropical Indian Ocean.

As shown in Table 2, the deep longline catches are mostly of bigeye and yellowfin tunas, such as in the north Atlantic, the catches of bigeye tuna and yellowfin tuna are 2,088 MT and 1,782 MT, respectively, which are very significant in comparison with the catch of albacore be only 113 MT; and in the south Atlantic, there are 772 MT and 343 MT for the catches of bigeye tuna and yellowfin tuna, respectively in comparison with 517 MT for the albacore catch.

The distributions of nominal catch per unit effort of albacore, bigeye tuna and yellowfin tuna by deep longline vessels are shown in Figs. 4, 5 and 6, respectively.

In order to understand the changes of catch composition (or target species) by Taiwanese longline vessels in the north and south Atlantic due to the transformation of fishing pattern, Table 3 tabulated the recent five years catches for the three major species. The result shows that the catches of bigeye tuna and yellowfin tuna abruptly increase in both north and south Atlantic in 1990, in particular, it is much more apparent in the north Atlantic than in the south Atlantic.

#### 2. Catch statistics

The catch statistics of catches, efforts and length measurements are processed by Institute of Oceanography, National Taiwan University, who is funded by the Department

of Fisheries, the Council of Agriculture. As usual, the catch statistics is summed up monthly five-degree square area catch and effort of the logbook of each vessels, which is also checked their position of operation by the daily position and catch report; subsequently a final raising factor, which is defined as the ratio of monthly sustainable number of vessels in operation to the number of sampled vessels, is given to raise the monthly five-degree square catch and effort into full real landings in the specific Ocean.

All of those catch statistic data are available at least twenty months after the imposed calendar year. And those data are regularly submitted to International Commission for the Conservation of Atlantic Tunas, Indo-Pacific Tuna Development and Management Programme and South Pacific Commission for particular use by Institute of Oceanography, National Taiwan University.

### 3. Research activities

In tradition, albacore is the most important species caught by Taiwanese longline fishery in the Atlantic. Therefore most of the tuna researches have been pursued for the species. In the Atlantic, the time series data of standardized catch per unit effort, which is standardized by means of Honma method with an average year from 1967 to 1990, are listed in Table 4.

Table 1 Monthly sustainable number of Taiwanese longline vessels operated in the Atlantic in 1990.

Type of Fishery	M O N T H											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Regular LL	70	69	72	76	77	79	79	80	81	81	82	82
Deep LL	17	17	18	19	20	19	19	20	23	28	29	30
Total	87	86	90	95	97	98	98	100	104	109	111	112

Table 2 Catches of tunas and tuna-like fishes by Taiwanese longline vessels in the Atlantic, 1990. (Unit: Metric tonnes)

Area	Type of Fishery	Effort (x1000 hooks)	S P E C I E S											TOTAL
			ALB	BET	YFT	BFT	SWF	WRN	BUN	BAN	BIL	SKJ	OTR	
NORTH	Regular LL	7433	1399	715	235	0	56	2	29	0	0	0	5	1801
	Deep LL	9979	113	2088	1782	0	257	22	322	0	25	0	206	4815
Subtotal		17412	1512	2803	2017	0	313	24	351	0	25	0	211	7256
NORTH	Regular LL	74878	21612	1324	655	13	473	360	267	4	44	0	387	25139
	Deep LL	7508	517	772	343	0	110	3	20	0	6	0	138	1903
Subtotal		82386	22129	2096	998	13	583	363	287	4	50	0	525	27048
TOTAL		99798	23641	4899	3015	13	896	387	638	4	75	0	736	34304

OTR: Sharks and other fishes were included in this group.

Table 3 Comparison of catches of three main species by Taiwanese longline vessels in the Atlantic during recent five years (1986 - 1990).

Unit: Metric tonnes

Area	Species	Y E A R				
		1986	1987	1988	1989	1990
NORTH	Albacore	19646	6636	2117	1294	1512
	Bigeye	436	243	28	39	2803
	Yellowfin	1165	440	2	150	2017
SOUTH	Albacore	27592	28790	20746	18386	22129
	Bigeye	938	2052	1260	1207	2096
	Yellowfin	558	926	1348	757	998

Table 4 The time series of adjusted catch rates of albacore in the north and south Atlantic, and effective efforts standardized by Horma method in using 1967 to 1990 as the average year for Taiwanese longline fisheries.

Year	NORTH ATLANTIC		SOUTH ATLANTIC	
	Effective effort	Catch rate	Effective effort	Catch rate
	(1000 hooks)	(No./100 hooks)	(1000 hooks)	(No./100 hooks)
1967	953	1.835	1028	3.945
1968	5699	2.587	14658	4.854
1969	6115	2.375	24927	3.381
1970	10704	1.878	21272	2.961
1971	9959	1.706	31941	3.825
1972	15409	1.700	47178	2.416
1973	29210	1.680	43211	2.200
1974	27823	1.557	39332	2.297
1975	21896	1.863	37811	2.684
1976	35333	1.238	55861	2.580
1977	33908	1.125	73925	2.290
1978	19296	1.500	70285	2.476
1979	16094	1.695	48783	2.206
1980	16419	1.749	46399	2.399
1981	22988	1.604	51675	2.166
1982	36036	1.958	63924	2.065
1983	46454	1.726	35421	1.792
1984	56559	1.525	21302	2.515
1985	67328	1.235	66967	2.039
1986	114834	1.016	98027	2.058
1987	41246	0.951	130666	1.535
1988	9931	1.372	99429	1.406
1989	5731	1.414	82469	1.408
1990	6082	1.006	73195	1.515

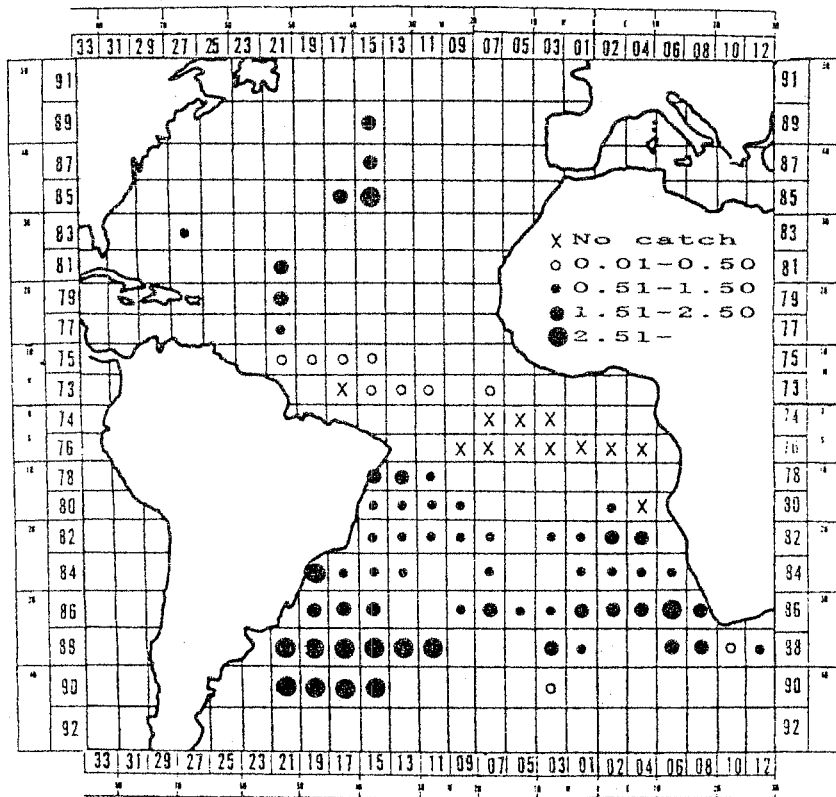


Fig. 1. The distribution of nominal catch per unit effort of albacore by Taiwanese regular tuna longline fishery in 1990 season.

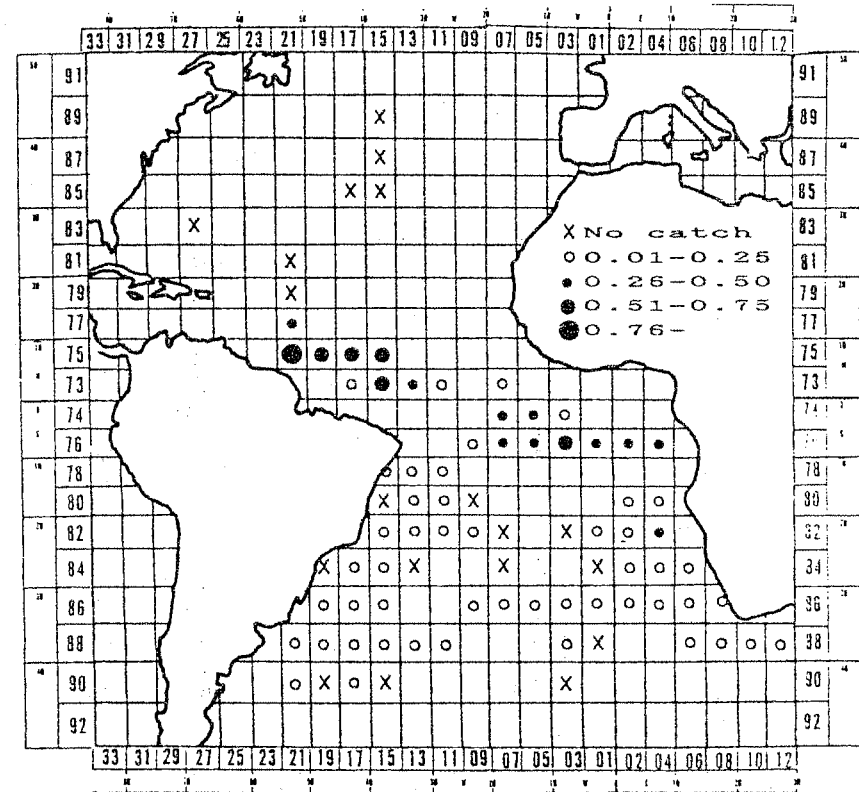


Fig. 2. The distribution of nominal catch per unit effort of bigeye tuna by Taiwanese regular tuna longline fishery in 1990 season.

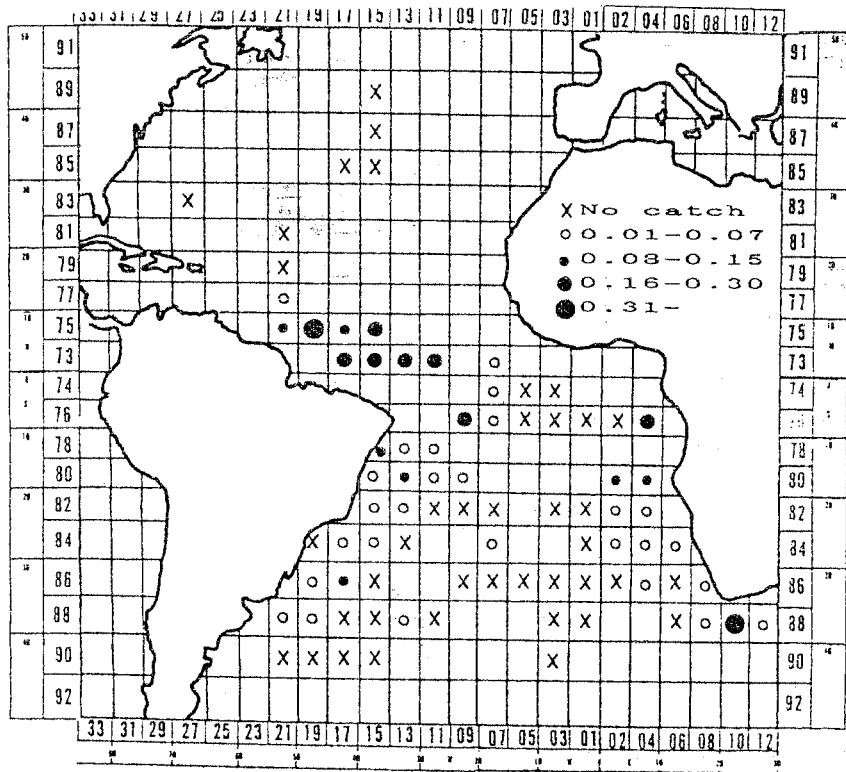


Fig. 3. The distribution of nominal catch per unit effort of yellowfin tuna by Taiwanese regular tuna longline fishery in 1990 season.

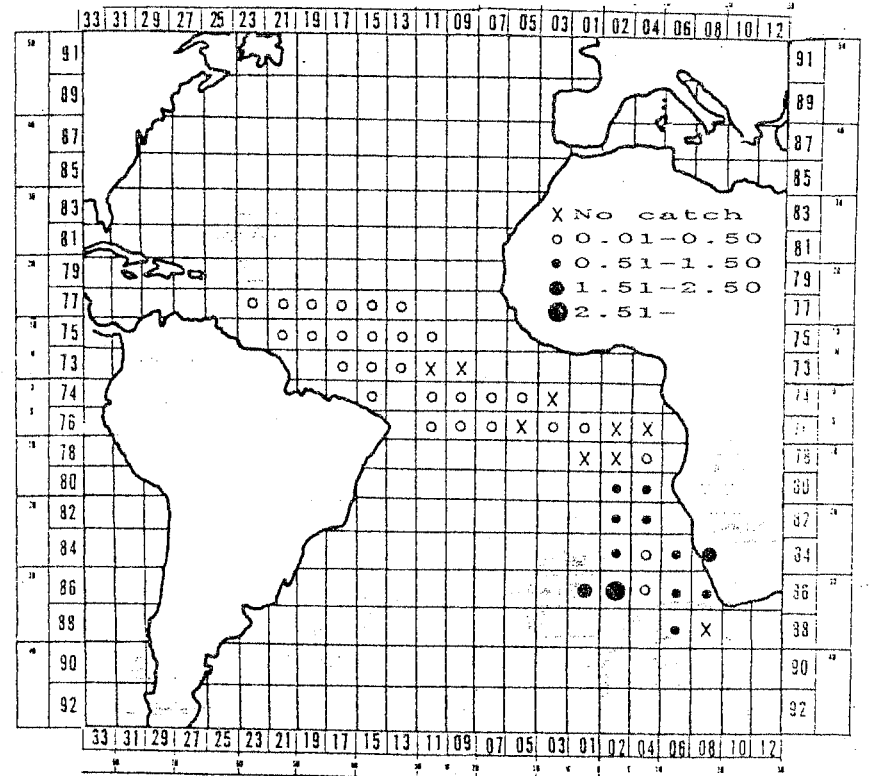


Fig. 4. The distribution of nominal catch per unit effort of albacore by Taiwanese deep tuna longline fishery in 1990 season.

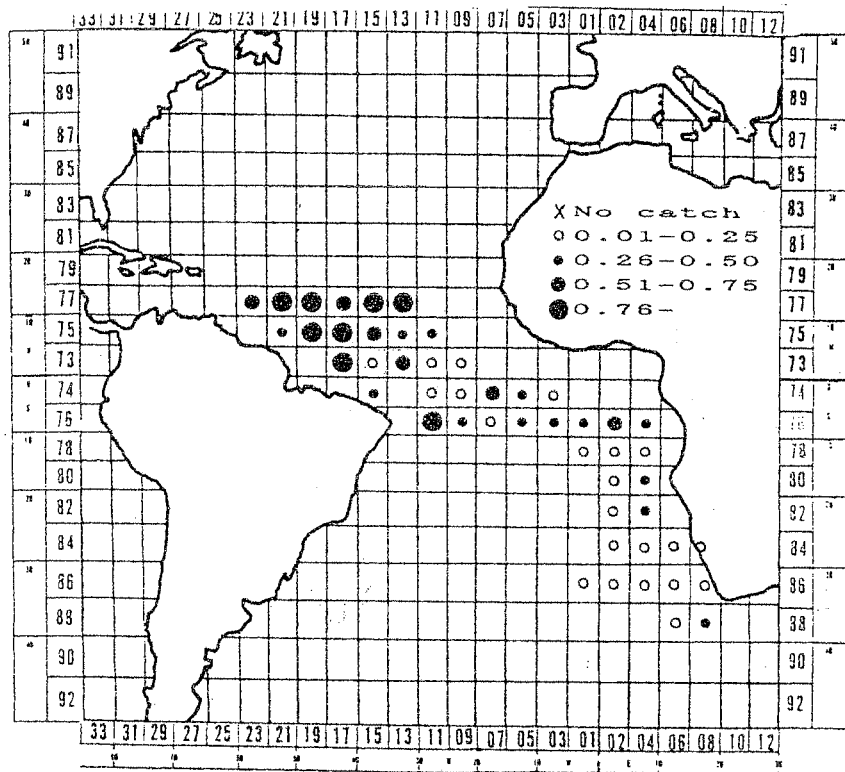


Fig. 5. The distribution of nominal catch per unit effort of bigeye tuna by Taiwanese deep tuna longline fishery in 1990 season.

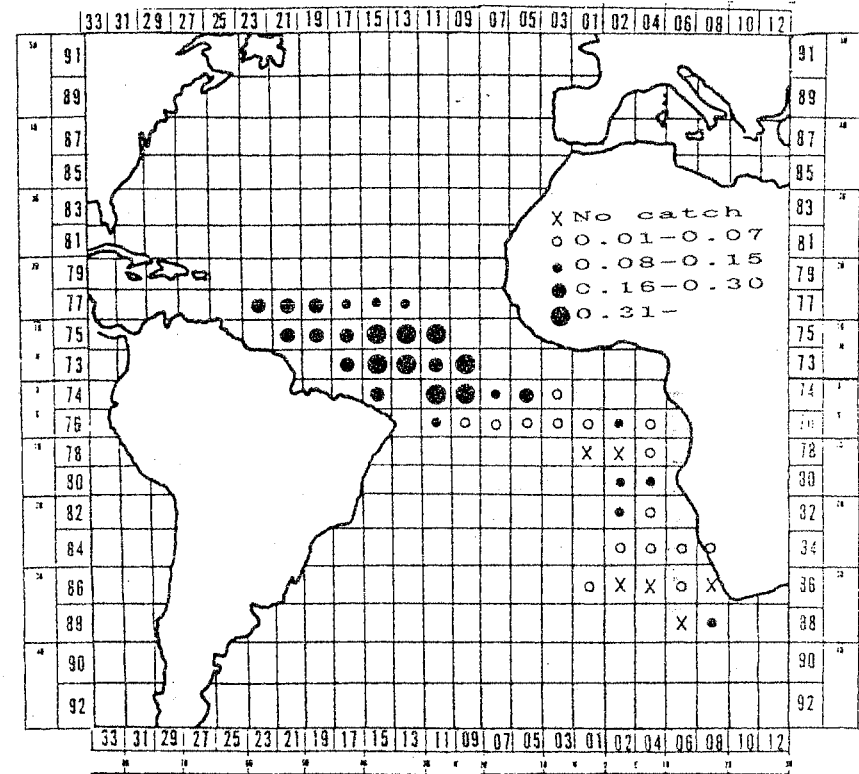


Fig. 6. The distribution of nominal catch per unit effort of yellowfin tuna by Taiwanese deep tuna longline fishery in 1990 season.