

## TAIWAN BLUEFIN TUNA FISHERY IN THE MEDITERRANEAN SEA WITH PRELIMINARY INVESTIGATION ON THE CATCH INFORMATION

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### SUMMARY

The longline fishery of Chinese Taipei started operating for bluefin tuna in the eastern Atlantic and the Mediterranean Sea in 1993. Many measures have been adopted on the fishery since 1994 to comply with ICCAT's regulations. Management control was applied to limit the total bluefin catch at a level lower than 547 MT, and preliminary estimates for 1997 and 1998 were 506 and 456 MT, among which 278 and 105 MT, respectively, were caught in the Mediterranean.

Information on the fishery and the catches is provided in this report. A preliminary length-weight relationship is also provided.

### RÉSUMÉ

La pêche palangrière de thon rouge du Taïpei chinois dans l'Atlantique Est et la Méditerranée a commencé en 1993. De nombreuses mesures ont été adoptées par la pêcherie depuis 1994 pour respecter les réglementations de l'ICCAT. Un contrôle de gestion a été appliqué pour limiter la prise totale de thon rouge à moins de 547 TM ; les estimations préliminaires de 1997 et 1998 sont respectivement de 506 TM et 456 TM, dont 278 TM et 105 TM capturées en Méditerranée.

Le présent travail fournit une information sur la pêche et la magnitude de la capture, ainsi qu'un rapport préliminaire longueur-poids.

### RESUMEN

La pesquería de palangre de Taipei Chino inició sus operaciones dirigidas al atún rojo en el Atlántico este y Mediterráneo en 1993. A partir de 1994 se han adoptado muchas medidas respecto a esta pesquería con el fin de cumplir con las regulaciones de ICCAT. Se aplicó a la captura total de atún rojo, una limitación de menos de 547 t, y las estimaciones provisionales para 1997 y 1998 eran 506 t y 456 t, respectivamente, de las cuales, 278 y 105 t se obtuvieron en el Mediterráneo.

Este informe facilita información sobre la pesquería y el volumen de la captura. También se dan relaciones provisionales de talla-peso.

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## 1. THE FISHERY

### 1.1. General overview

Taiwan longline fishery has been operating in the Atlantic Ocean since 1960s. Main target species of the fishery have been albacore, bigeye and yellowfin tunas, and bluefin tuna was caught as a by-catch. As from April 1993, some longliners equipped with super-cold freezers started to target on bluefin tuna. These vessels mainly operated in the Mediterranean and the waters adjacent to the Mediterranean in the eastern Atlantic. Table 1 shows the total bluefin catches by these vessels from 1993 to 1998. Data of 1997 and 1998 are still preliminary.

Starting from 1994, appropriate measures have been adopted to fulfill the ICCAT Bluefin Tuna Statistical Document Program. The catch data in Table 1 were obtained based mainly on the information as documented. A voluntary measure was adopted in 1996 to reduce the bluefin catch in the eastern Atlantic and Mediterranean Sea by 25% to 547 mt by using the generally applicable reference level set up at ICCAT's 9<sup>th</sup> special meeting.

According to Table 1, the peak catch of the eastern Atlantic and Mediterranean Sea of 729 mt was reached in 1994 and reduced later and leveled at 450-500 mt. The total catches of 1997 and 1998 were preliminarily estimated as 506 and 456 mt, respectively, among which, only 278 and 105 mt were caught in the Mediterranean Sea. Bluefin catch from the Mediterranean Sea has shown a decreasing trend recently.

### 1.2. Vessel number

There were 6 longline vessels fishing for bluefin tuna in 1993 and the number increased to 14 in 1994. To fulfill the ICCAT conservation measures on bluefin tuna, the number of vessels permitted to fish bluefin have been strictly controlled at 1994 level (14) thereafter.

### 1.3. Operation time

The operation time in 1993 lasted from April to July. However, since 1994, due to the adoption of ICCAT regulation measure of prohibiting fishing in June and July for the Mediterranean bluefin tuna, it has been strictly restricted to close the season before May 31. Vessels have to cease operation and leave the Mediterranean Sea after that day.

## 2. BLUEFIN CATCH INFORMATION

### 2.1. Effort distribution and nominal CPUE

Fig. 1 shows the 1995-1998 effort distribution of the longliners in the Mediterranean. A total of 5.8 million hooks were deployed in 1995, and 5.1 million in 1996, 3.7 million in 1997 and 1.4 million in 1998. Fishing effort in the Mediterranean has shown a decreasing trend in 1995-1998. There were only 3 vessels entering the Mediterranean in 1998 for bluefin tuna.

The monthly nominal CPUE during 1995-1998 varied between 0.15-0.45 fish or 26-99 kg per 1000 hooks. However, the annual CPUE was considered to be stable, 0.35-0.37 fish or 73-84 kg per 1000 hooks during 1995-1998 (Table 2).

According to the logbooks from the permitted longliners, bluefin tuna was the major catch in the Mediterranean Sea which composed more than 97% in number during the fishing season (April and May) of 1995-1998, compared to about 30%-80% in the eastern Atlantic waters adjacent to the Mediterranean during the same period. Swordfish was the secondary species caught, but composed less than 1% in number in most cases.

### 2.3. Size frequency and length-weight relationship

Size data were provided by fishermen and were sent daily during their operation with the logbook information. Compiled length frequency distribution of bluefin catch in the Mediterranean is shown in Fig. 2. The major length class caught in 1995-1998 was around 200-270 cm and peaked around 225 cm. Mean lengths and mean weights of those years are tabulated in Table 2. Mean lengths were around 223-232 cm, and mean weights were around 198-240 kg.

Fig. 3 plots the four years combined length and weight data. Preliminary estimated length-weight equation was

$$RW = 5.5 \times 10^{-4} \cdot FL^{2.36511}$$

where,  $RW$  is round weight in kg and  $FL$  is fork length in cm. Roughly compared to the equations published in ICCAT Field Manual (3<sup>rd</sup> Edition, 1990, p. 172), weight calculated from this equation was a little smaller than that from the equation for the Mediterranean, but was close to that from the equation for the eastern Atlantic. Further studies are necessary in the future to investigate the differences in detail.

Table 1. Annual bluefin catch and number of longline vessels targeted on bluefin tuna, 1993-1998. "Total" includes catches or vessels in the waters of the eastern Atlantic and the Mediterranean. "Mediterranean" indicates catches caught or vessels entered the Mediterranean Sea.

Year	1993	1994	1995	1996	*1997	*1998.
Catch (MT)	Total	334	729	502	472	456
	Mediterranean	328	709	494	411	105
Vessels	Total	6	14	14	14	14
	Mediterranean	6	14	14	14	3

\* Preliminary estimates

Table 2. Summary statistics of the Mediterranean bluefin tuna fishery of Taiwan longline fishery during 1995-1998.

	1995	1996	1997	1998
Hooks (*1000)	5,829	5,499	3,703	1,351
Catch (Number of fish)	2,057	2,056	1,343	501
Catch (MT)	494	411	278	105
Mean Weight (Kg)	240	200	207	210
Mean Length (cm)	232	223	223	230
CPUE (Fish/1000 hooks)	0.35	0.37	0.36	0.37
CPUE (Kg/1000 hooks)	84.68	73.81	75.08	78.05

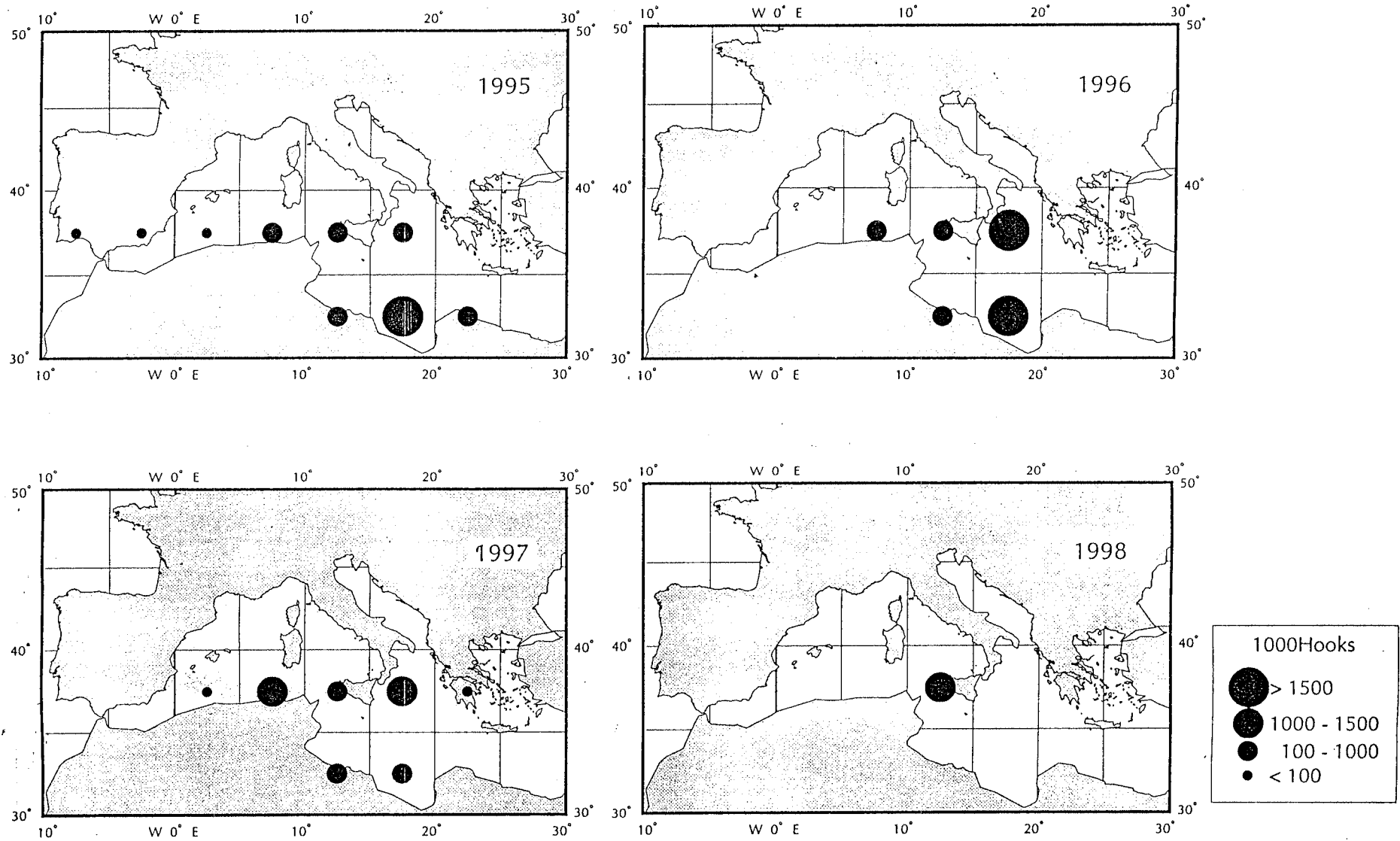


Fig. 1. Effort distribution of Taiwan longline fishery in the Mediterranean Sea, 1995-1998.

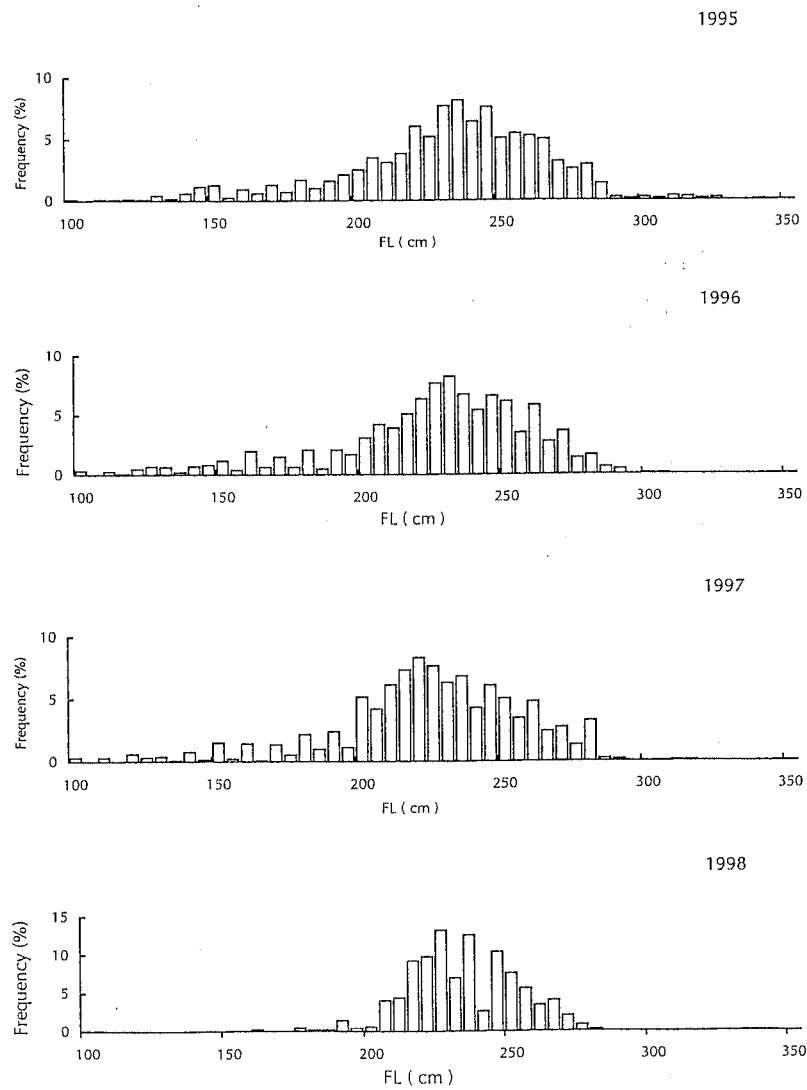


Fig. 2. Length frequency distributions of the Mediterranean bluefin tuna by Taiwan longline fishery, 1995-1998.

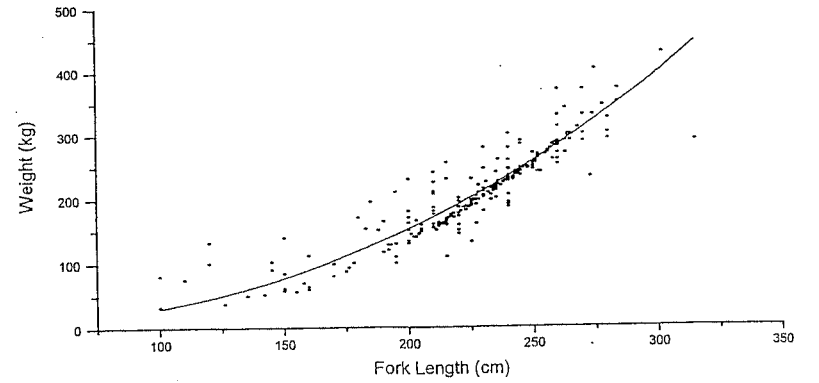


Fig. 3. Length-weight relationship of bluefin tuna by Taiwan longline fishery for 1995-1998 data combined.