

## SOME REMARKS ON THE BLUEFIN TUNA (*THUNNUS THYNNUS* L. 1758) FISHERY IN TURKISH WATERS IN 1993, 1994, 1995

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### SUMMARY

Bluefin tuna which have economic importance in Turkey's fisheries have been over-fished in the last ten years. The 1985 catch was 2,230 MT, which decreased to 998 MT in 1994.

The present distribution of bluefin tuna in Turkish waters is as follows. The first catches were made in the Bay of Saroz (in the north Aegean Sea). As the tunas move southwards, they are caught around the Islands of Gökçeada and Bozcaada (north Aegean Sea) and in the Bays of Ayvalik, Izmir and Gulluk. The tunas move later to the eastern Mediterranean area and are caught in the eastern Mediterranean in the Bays of Antalya and Iskenderun (Figure 1).

The bluefin tuna fishery begins in September and ends in May. During the summer months, the catch of bluefin tuna is prohibited.

In this research, the height and weight measurements of bluefin tuna caught by the purse seiners in Turkish waters and brought to the Istanbul Fish Market are recorded.

For age analyses, the primary beams of the first dorsal fins were taken. The situation of the tuna fishery in 1993, 1994 and 1995 is discussed.

The studies carried by various researchers and interviews with the fishermen showed that bluefin tunas have not been caught in the Black Sea and in the Sea of Marmara since 1987.

### RÉSUMÉ

Le thon rouge, qui est une espèce importante en Turquie du point de vue économique, est sur-pêché depuis une dizaine d'années. En 1985, la capture était de 2230 TM. En 1994, elle n'atteignait plus de 998 TM.

La distribution actuelle du thon rouge dans les eaux turques s'établit comme suit : les captures les plus importantes ont lieu dans la Baie de Saroz (Nord de la Mer Egée). Au cours de leur migration vers le Sud, les thons rouges sont capturés dans les îles de Gökçeada et de Bozcaada (Nord de la Mer Egée) et dans les baies de Ayvalik, Izmir et Güllük. Les thons se déplacent ensuite dans la zone orientale de la Méditerranée et sont capturés dans les baies d'Antalya et d'Iskenderun (Figure 1).

Les thons rouges sont pêchés entre septembre et mai. Les captures sont interdites au cours des mois d'été.

Les données de longueur et de poids des thons rouges capturés à la senne dans les eaux turques et amenés au marché d'Istanbul sont récapitulées.

Les principaux rayons des premières nageoires dorsales ont été prélevés pour procéder à des analyses sur l'âge. La situation de la pêcherie de thonidés en 1993, 1994 et 1995 est analysée.

Les recherches menées par différents scientifiques et les enquêtes auprès des pêcheurs indiquent que le thon rouge n'est plus capturé dans la Mer Noire et dans la Mer de Marmara depuis 1987.

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## RESUMEN

El atún rojo, que es importante desde el punto de vista económico para la pesquería de Turquía, ha sufrido sobrepesca en los últimos diez años. En 1985 la captura fue de 2.230 t, disminuyendo en 1994 hasta 998 t.

La actual distribución del atún rojo en aguas turcas es la siguiente: las primeras capturas se obtienen en la Bahía de Saroz (al norte del mar Egeo). A medida que los peces se desplazan hacia el sur, se pescan alrededor de las islas Gökçeada y Bozcaada (al norte del mar Egeo) y en las Bahías de Ayvalik, Izmir y Güllük. Los túnidos se desplazan después hacia la zona del Mediterráneo este y se pescan en las Bahías de Antalya y Isgenderun (Figura 1).

La pesquerías de túnidos se inicia en septiembre y finaliza en mayo. Durante el verano la pesca del atún rojo está prohibida.

En este documento se presentan las medidas de talla y peso de los atunes rojos capturados con cerco en aguas turcas y que se llevan al mercado de Istanbul.

Se extrajeron los radios de la primera aleta dorsal con el fin de llevar a cabo análisis relacionados con la edad. Se discute la situación de la pesquería de túnidos en los años 1993, 1994 y 1995.

La investigación llevada a cabo por varios científicos y por medio de entrevistas con pescadores, mostró que no se capturan atunes rojos en el mar Negro y en el mar de Mármara desde 1987.

## INTRODUCTION

Bluefin tunas which take economically an important place in Turkey's fishing were overfished in the latest ten years (Anonymous, 1980-1994).

Major components of bluefin tuna catches are made by Turkish purse-seiners in the Aegean Sea and in the Eastern parts of the Mediterranean Sea.

The present distribution of the Bluefin tunas in the Turkish waters is as follows: The first catches are made in the Bay of Saroz (in the Northern Aegean Sea). As the tunas move southwards, they are caught around the Islands of Gökçeada and Bozcaada (Northern Aegean Sea) and in the bays of Ayvalık, Izmir and Güllük. The tunas move later to the Eastern Mediterranean area and are caught in the Eastern Mediterranean in the bays of Antalya and Iskenderun.

In Turkey bluefin tunas are fished especially during the entire winter months, whereas, bluefin tunas are caught during the entire summer months in European countries. Bluefin tuna fishery begins in September, the catch of bluefin tunas in summer is forbidden.

The bluefin tuna catch is shown in Table 1.

Table 1: Catch of bluefin tunas ton / year

Years	Tons
1980	391
1981	565
1982	825
1983	557
1984	869
1985	2230
1986	1524
1987	910
1988	1550
1989	2809
1990	2137
1991	2436
1992	679
1993	1155
1994	998

The minimum catchable size of bluefin tuna recommended by the Ministry of Agriculture and Rural Affairs, Direction for Protection and Control is 90 cm (TL).

In this study, we determined the bluefin tuna fishing seasons, the fishing period, and the primary fishing grounds. We also prepared the frequency size distribution graphs and compared these values with the minimum catchable size of the bluefin tunas.

We investigated whether the bluefin tuna catches were made in accordance with the recommended catchable size of bluefin tunas and observed the undersized caught bluefin tunas.

## **MATERIALS AND METHODS**

All the bluefin tuna catches measured in our study were made by purse seiners in Turkish waters. During the investigations, the fork lengths (FL) and the weights (W) of 2073 bluefin tunas (BFT) landed at the Istanbul Fish Market were measured. For ageing the BFT from the dorsal fin rays, a total of 1025 dorsal fin spines were collected, and 200 of these dorsal fin spines were analysed. The method of extraction, preparation and the spine which was described by Cort (1990) was used. Other spines are being analyzed.

The Bluefin tuna fishery, the important fishing grounds and the number of fishing boats (purse-seiners), were noted in 1993, 1994 and in 1995.

### **Bluefin Tuna Fishery in 1993:**

BFT fishery started in January and ended in April. Due to the prohibition of the catch of BFT in May-September, no BFT were caught. BFT were caught in October, November and December. BFT were caught intensively in January, February and March. In 1993, BFT were caught by means of 47 purse seiners.

Illustrated in percentages, the most important fishing grounds were Çanakkale with 43.14 %, the Bay of Iskenderun with 42.62 %, and Izmir with 11.27 %.

In 1993, a total of 976 BFT were measured. FL of BFT ranged from 59 to 242 cm. FL frequency distribution was determined on hand of measurements. The 160-169 cm size interval was the most abundant in catches (170 of 976). BFT in this interval were 17.42 % of all measured BFT. This interval was followed by 170-179 cm, FL size interval (15.06 %). Among all others, BFT in 50-59 cm and 240-249 cm size intervals were the least abundant among others. Only in January and April, BFT of 50-120 cm FL were caught.

### **Bluefin Tuna Fishery in 1994:**

BFT were caught only in January, February, April and May. No BFT were captured in March. After the prohibited catching season, the fishermen caught BFT in October, November, and December. In January, April, and December, BFT were caught intensively, in 1994, BFT catches were made by 28 purse seiners.

The most important fishing grounds were the Bay of Iskenderun with 45.98 %, Çanakkale with 36.93 %, and Izmir with 8.29 %.

In 1994, a total of 304 BFT were measured. FL of BFT ranged from 71 to 255 cm. BFT in 160-169 cm FL size interval was the most abundant in catches (66 of 304). BFT in this interval was 16.62 % of all the measured BFT. This interval was followed by the 150-159 cm size interval by 15.86 %. BFT in 250-259 cm size interval was the least abundant among others. Only in January and April, BFT with 70-120 cm FL were caught.

### **Bluefin Tuna Fishery in 1995:**

BFT fishery started in February. BFT were caught from March till the end of May. After the prohibited catch season, BFT also were caught in October and November. No BFT were caught during December and January. BFT were caught intensively in March and April. In 1995, BFT catches were made by 28 purse seiners.

The most important fishing grounds were in the surroundings of Antalya 91.80 % and in Çanakkale with 8.20%. Due to the petroleum leakage which occurred in 1994 in the Yumurtalık oil refinery in the Turkish East Mediterranean Sea, no BFT were caught in the Bay of Iskenderun. BFT caught in 1994 in this region had a petroleum scent and could be exported to Japanese markets.

In 1995, a total of 783 BFT were measured. FL of BFT ranged from 77 to 242 cm. The BFT of 90-99 cm were the most abundant in catches (155 of 783 specimens). BFT of this size interval comprised 19.55 % of all the measured BFT. This size interval was followed by 140-149 cm FL size interval (18.6 %). BFT of 220-229 cm and 240-249 cm were the least abundant. BFT of 70-120 cm FL were caught only in March and April.

### LENGTH - AGE RELATIONSHIP

Dorsal fin spines of 200 BFT were studied, but 163 of those spines could not be analyzed. The distribution of length-age is shown in Table 2.

### RESULTS

Investigations carried on in the years of 1955-56 stated that the bluefin tunas were going to the Marmara Sea and then to the Black Sea for reproduction and feeding (Slastenenko, 1955-56).

Sara (1964) and Devedjan (1926) noted that from April on, the bluefin tunas are passing to the Bosphorus and to the Black Sea and are staying in these waters in great numbers from July till the end of August. From October till the end of December, there is a migration to the north and to the south-west.

Since 1987, no BFT were caught in the Dalian of Beykoz (Bök, 1992).

Interviews with the fishermen illustrated that since 1987 no BFT were caught in the Black Sea and in the Sea of Marmara. On the other hand, no spawning of BFT and no young tuna fishes in the Black Sea and in the Sea of Marmara were observed (Manfrin-Piccinetti et al. 1994).

In the period of 1993-1995, No BFT were caught in the Black Sea or in the Sea of Marmara.

According to Akyüz and Artüz (1957), BFT were caught in the Black Sea and in the Sea of Marmara, of 120 cm and 330 cm, whereby the average length was  $228.9 \pm 2.8$  cm.

In our investigations, the length varied in 59 - 255 cm. The medium length was  $157.72 \pm 2.6$  cm.

We see a difference in the lengths of BFT in 1993-95 in the investigations stated above. In 1993-1995 in Turkish Waters, BFT bigger than 2 meters FL were caught very seldomly.

It was found that the bluefin tunas are caught intensively in December, January, February, March, April and May. The BFT smaller than 120 cm are caught in January, March and April.

During our investigations, it was found that only 1.96 % of the BFT were smaller than 90 cm. This shows that the fishermen catch BFT keeping the regulative measure in mind.

The main fishing grounds were in the Bay of Iskenderun, in Çanakkale, and in Antalya regions.

İyigüngör (1957) stated that the BFT were usually caught by longlines and in dalianes. After 1950 with the introductions of purse seiners, the BFT are caught mainly by purse seiners.

In 1993, there were 46 purse seiners fishing BFT. In 1994 and in 1995, the number of purse seiners fishing BFT decreased by 39.1%; by number to 28 purse seiners.

The reason for the decrease, in the number purse seiners catching BFT, is that the purse seiners prefer to catch bonitos, anchovies, bluefish, and horse mackerels. Purse seiners which go daily to sea to catch BFT do not catch BFT every day. Due to the increasing costs of the fishermen, other fish easy to catch and bringing more profit are landed.

The variation in the export prices of BFT during the year, the low export prices, and the low prices of BFT in the native market caused a decrease in the number of purse seiners catching BFT.

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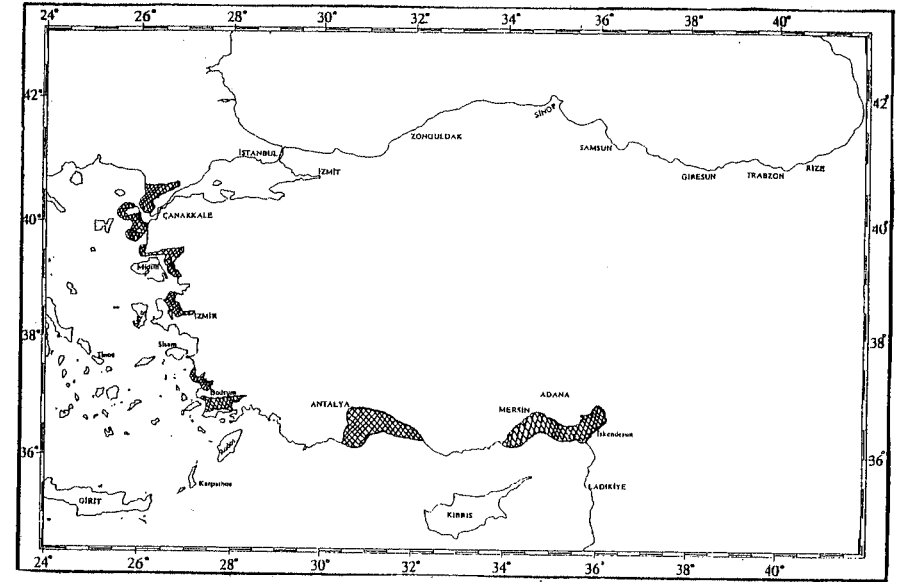


Figure 1: The distribution of the bluefin tunas in Turkish Waters

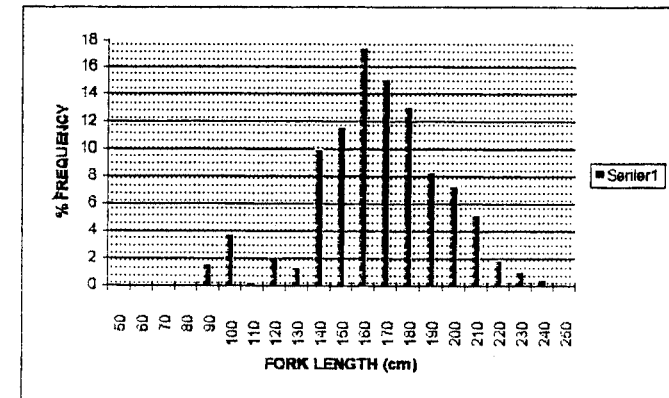


Figure 2: The fork length composition of bluefin tunas in the purse-seine fishery in Turkish Waters in 1993

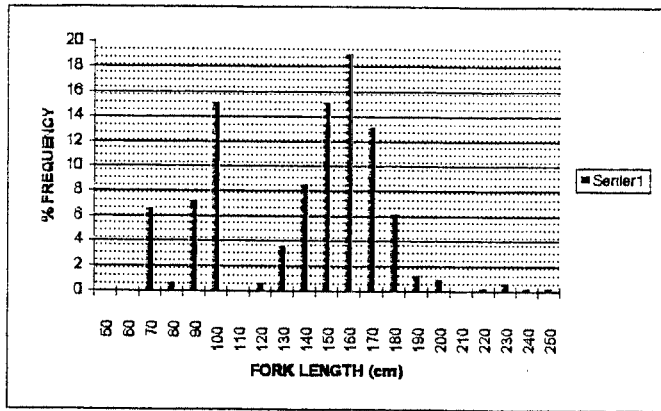


Figure 3: The fork length composition of bluefin tunas in the purse-seine fishery in Turkish Waters in 1994

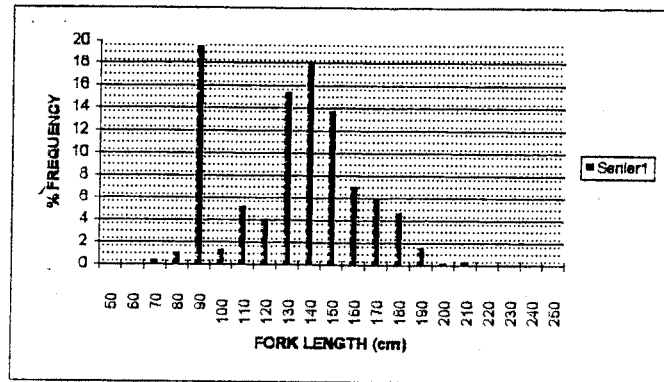


Figure 4: The fork length composition of bluefin tunas in the purse-seine fishery in Turkish Waters in 1995

Table 1: Catch of bluefin tunas ton / year

Years	Tons
1980	391
1981	565
1982	825
1983	557
1984	869
1985	2230
1986	1524
1987	910
1988	1550
1989	2809
1990	2137
1991	2436
1992	679
1993	1155
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Table 2: The size/age key of bluefin tunas caught by purse-seiners in Turkish Waters

LENGTH (cm)	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8
50-54								
55-59	1							
60-64								
65-69								
70-74		7						
75-79		5						
80-84								
85-89								
90-94								
95-99				1				
100-104			18	2				
105-109			29					
110-114			2					
115-119				1				
120-124			1	7				
125-129				10				
130-134				4	2			
135-139				1	2			
140-144				11	10			
145-149					16	2		
150-154					6	4		
155-159					3	1		
160-164						1	5	
165-169						1	4	
170-174							1	
175-179							1	
180-184							2	1
185-189								
190-194								1
195-199								
N	1	12	50	37	39	9	13	2