

**GENERAL FISHERIES COUNCIL FOR THE MEDITERRANEAN  
CONSEIL GÉNÉRAL DES PÊCHES POUR LA MÉDITERRANÉE**

Report of the second

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**TECHNICAL CONSULTATION ON STOCK ASSESSMENT  
IN THE EASTERN MEDITERRANEAN**

Athens, Greece, 28 March - 1 April 1988

Rapport de la deuxième

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**CONSULTATION TECHNIQUE SUR L'ÉVALUATION  
DES STOCKS DANS LA MÉDITERRANÉE ORIENTALE**

Athènes, Grèce, 28 mars - 1<sup>er</sup> avril 1988



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS  
ORGANISATION DES NATIONS UNIES POUR L'ALIMENTATION ET L'AGRICULTURE

APPENDIX/ANNEXE P

Fisheries for Large Scombrids in Greek Waters:  
Catches of Thunnus alalunga (Bonn 1798)

by

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ABSTRACT

The results of investigations on albacore fishery in the Greek Seas in 1986 are reported on. Mostly concentrated in the Sporades Islands and in the Chalkidiki peninsula, 169 vessels carried out this activity for a yearly total catch of about 500 tons.

In the pilot port of Alonisos fishing effort and cpue were also calculated, while size distribution and length-weight correlation were studied for a significant sample.

1. INTRODUCTION

Literature did not report information on the distribution of albacore in the seas around Greece or on its fishery by the Greek fishing fleet.

It was therefore necessary within the framework of the programme on the large Scombrid fishery, to direct some attention to this species in which the operators of various Mediterranean countries are becoming increasingly interested.

2. MATERIALS AND METHODS

Data on the number and position of the fishing ports, number and size of the vessels practising the albacore fishery, fishing grounds and total catch were obtained through interviews, on-the-spot investigations and direct study.

For the study of fishing effort and cpue was considered the albacore fishery by Alonisos fleet in the Sporades. As fishing in this harbour was carried out with two different gears (longline and troll-line) we have calculated fishing effort and cpue separately in each case.

For longline fishing effort was obtained with the formula:

$$E = \frac{\bar{a}}{1\ 000} \times d$$

where  $\frac{\bar{a}}{1\ 000}$  represents the number of hooks set daily, divided by the unit of measure of the effort considered as 1 000 hooks.

<sup>1/</sup> "This study does not necessarily reflect the opinion of the Commission of European Communities and does not prejudice their future attitude in this field"  
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For the troll-line it was obtained with the formula:

$$E = h \times d$$

where h represents the average number of working hours each fishing day and d the fishing days. Cpue were calculated in both biomass and number of specimens with the formula:

$$E = \frac{\text{kg}}{E} \text{ and } \frac{\text{No. specimens}}{E}$$

For the study of size distribution, the fork-length of 868 individuals was measured during the two months, September-October, fishing period in 1986.

The total weight of the same individuals uneviscerated was also taken, and the fork length-weight relationship computed by the formula:  $W = a \times LF^b$  where W = total weight of fish in kg, LF = fork length in cm and a, b are constants.

### 3. RESULTS

#### 3.1 Harbours and Vessels

Table 1 reports the regions and the corresponding number of vessels, with relative sizes, that carry out the albacore fishery. The 169 vessels operating are mainly concentrated in the Chalkidiki region and specifically at P. Kufo where all the vessels collect at the beginning of the fishing season and remain for its duration. Another important fishing port for the albacore fishery is Alonisos in the Sporades, with a fleet of 64 vessels. At Alonissos there is a well-organized fishermen's cooperative society which organizes the delivery and the selling of the catch.

#### 3.2 Fishing Period

The fishing period for albacore is shown in Table 1 together with the number of boats involved. It begins around 15 August. September, October and November are the busiest months.

#### 3.3 Fishing Areas

From our information the most important zone for albacore in the Aegean is the area between the Sporades islands and the Chalkidiki peninsula. This fishing ground is exploited by the most important fleets for the albacore fishery. Another much less important area is facing the Gulf of Patra. Other areas (Lesvos, Kalymnos, Leros) are marked on the map where we have ascertained and demonstrated the presence of albacore during the tagging of young swordfish in 1985 and 1986. This fact caused the interest of the local fishermen and they began exploiting the albacore resources but soon they stopped because of the low prices offered by traders.

#### 3.4 Systems of Capture

Fishing equipment used is longline and troll-line. It is not to be excluded that fishermen use both at the same time. The longline for albacore, with which young blue-fin tuna are occasionally captured, is made up of a mainline of monofilament nylon of diameter 120 from which single thread sidelines of diameter 0,30 lead of at 15 m intervals with No. 7 hooks. It is about 15 km long and has about 1 000 hooks.

The floats, 1 litre in capacity, are generally attached every 7 hooks. Setting begins around 3.00 am, and goes on for two hours. Recovery begins after sunrise and lasts for about three hours. Sardinia pilchardus Walb or Sardinella aurita C.V. are used as bait. The troll-line is used with various kinds of artificial bait. Each boat uses two trolling lines.

#### 3.5 Total Catch

Total albacore production was 494 tons (Table 3) of which 336 tons (69,43%) came from the Chalkidiki region. The other zones with reasonable quantities of catch were, in order of importance: the Sporades islands (57.5 tons), Thessaloniki (35 tons), Kavala (31.5 tons) Magnisia (21.5 tons),

The average yearly catch per vessel was 2.36 tons with a maximum value of 7 tons for the vessels of Thessaloniki and a minimum of 0.4 tons for the vessels of Peloponnisos.

#### 3.6 Fishing Effort and cpue

The data (Tables 4, 5, 6 and 7) are referred to the 1986 fishing season. The pilot port considered for albacore fishing was Alonisos in the Sporades. As fishing in this port was carried

out with two different gears (longline and troll-line) we have calculated fishing effort and cpue separately in each case.

### 3.6.1 Longline fishery

In the months of September and October 1986, 20 vessels took part in the longline fishery. As some of them did not work continuously, all the fishing period, their number for each month was taken as 17. From Tables 4 and 5 it can be seen that these boats totalled 156 fishing days, capturing 2 783 albacore for a total weight of 16 007 kg, with an average weight of 5.75 kg. Fishing effort was 160.9 and cpue in number of individuals had an average value of 17.39 while the average value by weight was 100 kg.

### 3.6.2 Troll-line fishery

In 1986 45 vessels were involved in this activity at Alonisos port. In the September-October period (Tables 6 and 7) they totalled 471 fishing days with 3 585 working hours, capturing 5 546 individuals for a total weight of 28 835 kg with an individual average weight of 5.20 kg. Cpue in number of fishes reached 1.55 while in biomass it was 8.04 kg. Fishing effort was 3 585.

### 3.6.3 Size distribution

The length of 868 individuals was measured at Alonisos. Size distribution is indicated in Figure 1. Minimum size found was 55.5 cm and maximum was 81.1 cm. Individuals with LF between 60 and 70 cm corresponding to 2 years of age (Cefali *et al.*, 1986) were more numerous (61.5%) followed by a reasonable quantity with LF between 71 and 80 cm probably 3 years old (36.6%). Size distribution over the months can be seen in Figure 2.

### 3.6.4 Length-weight correlation

Length-weight relationship was calculated for all 868 non-eviscerated fishes. The equation obtained was:

$$W = 4.183 \times 10^{-5} \times LF^{2.80} \quad r = 0.970$$

### 3.6.5 Tagging

Eighteen individuals were tagged. They were captured to the east of the island of Kalymnos, 1-2 miles from the coast. No one has been recaptured yet.

## 4. CONCLUSIONS

Although Ninni (1923) claims that this species is not widespread in the Greek seas, our observations indicate that its distribution area is quite wide even if the only area where fishing is regularly carried out is between the Sporades islands and the peninsula of Chalkidiki. We believe that the two main reasons for this scarce activity are:

1. in many zones, as in the eastern part of the Aegean, this species is not known even if present;
2. market demand is not enough to encourage fishermen to take an interest.

The size distribution indicates that fishing effort is mainly directed to fishes 2 or 3 years old, and that the fishing area represents a trophic area of concentration.

## 5. REFERENCES

- Cefali, A., *et al.*, 1986. Biology and fishing of germon Thunnus alalunga (Bonn 1788) observed for a four-year period in the Gulf of Taranto. Oebalia, vol. XIII, N.S., pp. 123-136
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Table 1

Division of albacore fishing vessels according to the size for each geographical zone

ZONES	NUMBER OF VESSELS	LENGTH OF VESSELS (m)		
		< 9	9 - 14	> 14
PELOPONISOS	3	-	3	-
SPORADES	64	42	20	2
MAGNISIA	9	-	3	6
KAVALA	7	7	-	-
THESSALONIKI	5	-	-	5
CHALKIDIKI	80	17	35	7
EVIA	1	1	-	-
TOTAL	169	67	61	20

Table 2

Distribution of vessels in the fishing period of albacore

ZONES	JAN.-JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
PELOPONISOS	-	-	3	3	3	-
SPORADES	-	2	64	64	39	-
MAGNISIA	-	-	8	8	2	-
KAVALA	-	1	4	6	6	-
THESSALONIKI	-	-	5	5	-	-
CHALKIDIKI	-	30	80	80	80	40
EVIA	-	-	1	1	-	-
TOTAL	-	33	162	164	127	40

Table 3

Total albacore catches per region and average annual catch per vessel in the year 1986

ZONES	NUMBER OF VESSELS	TOTAL CATCH (t)	AVERAGE CATCH PER VESSEL (t)
PELOPONNISOS	3	1.2	0.4
SPORADES	64	57.6	0.9
MAGNISIA	9	21.6	2.4
KAVALA	7	31.5	4.5
THESSALONIKI	5	35.0	7.0
CHALKIDIKI	80	336.0	4.2
EVIA	1	1.0	1.0
TOTAL	169	483.9	2.86

Table 4

Fishing effort and cpue referring to longline fishery estimated for Alonisos fishery

	SEPTEMBER	OCTOBER	TOTAL
Number of vessels	17	17	20
Fishing days	80	76	156
No of Hooks	1077	972	1026
Fish. effort (x 1000hook)	86.15	73.90	160.90
CPUE <sub>indiv. alalunga</sub>	20.94	13.25	17.39
CPUE <sub>biom. alalunga</sub>	118.36	78.63	100.02
CPUE <sub>indiv. bluefin</sub>	1.06	0.07	0.6
CPUE <sub>biom. bluefin</sub>	5.09	0.36	2.91
CPUE <sub>indiv. total</sub>	22.25	13.38	18.16
CPUE <sub>biom. total</sub>	125.79	80.19	104.74

Table 5

Summarized data for longline captures from Alonisos fishery

	SEPTEMBER	OCTOBER	TOTAL
Individ. of albac.	1804	979	2783
Biomass albac. (Kg)	10196	5811	16007
Aver. weight albac.	5.65	5.93	5.75
Individ. of bluef.	91	5	96
Biomass bluef. (Kg)	439	27	466
Aver. weight bluef.	4.82	5.4	4.8
Total individuals	1917	989	2906
Total biomass	10837	5926	16763

Table 6

Fishing effort and cpue estimated for Alonisos troll-line fishery in 1986

	SEPTEMBER	OCTOBER	TOTAL
Number of vessels	41	38	45
Fishing days	266	205	471
Av. hours/vessel	7.5	7.78	7.6
Trol.line/vessel	2	2	2
Fish. effort(Hours)	1990	1595	3585
CPUE <sub>indiv. alalunga</sub>	1.5	1.6	1.55
CPUE <sub>biom. alalunga</sub>	7.75	8.4	8.04
CPUE <sub>indiv. bluefin</sub>	0.29	0.02	0.17
CPUE <sub>biom. bluefin</sub>	1.80	0.01	0.83
CPUE <sub>indiv. total</sub>	1.8	1.62	1.72
CPUE <sub>biom. total</sub>	9.15	8.52	8.87

Table 7

Summarized data of the catches by the Alonisos troll-line fishery in 1986

	SEPTEMBER	OCTOBER	TOTAL
Individ. of albac.	2996	2550	5546
Biomass albac.(Kg)	15414	13421	28835
Av.weight alb.(Kg)	5.14	5.26	5.2
Individ. of bluefin	579	32	611
Biomass bluef.(Kg)	2785	175	2960
Av.weight bluef.(Kg)	4.8	5.48	4.84
Total individuals	3575	2582	6157
Total biomass	18199	13596	31796

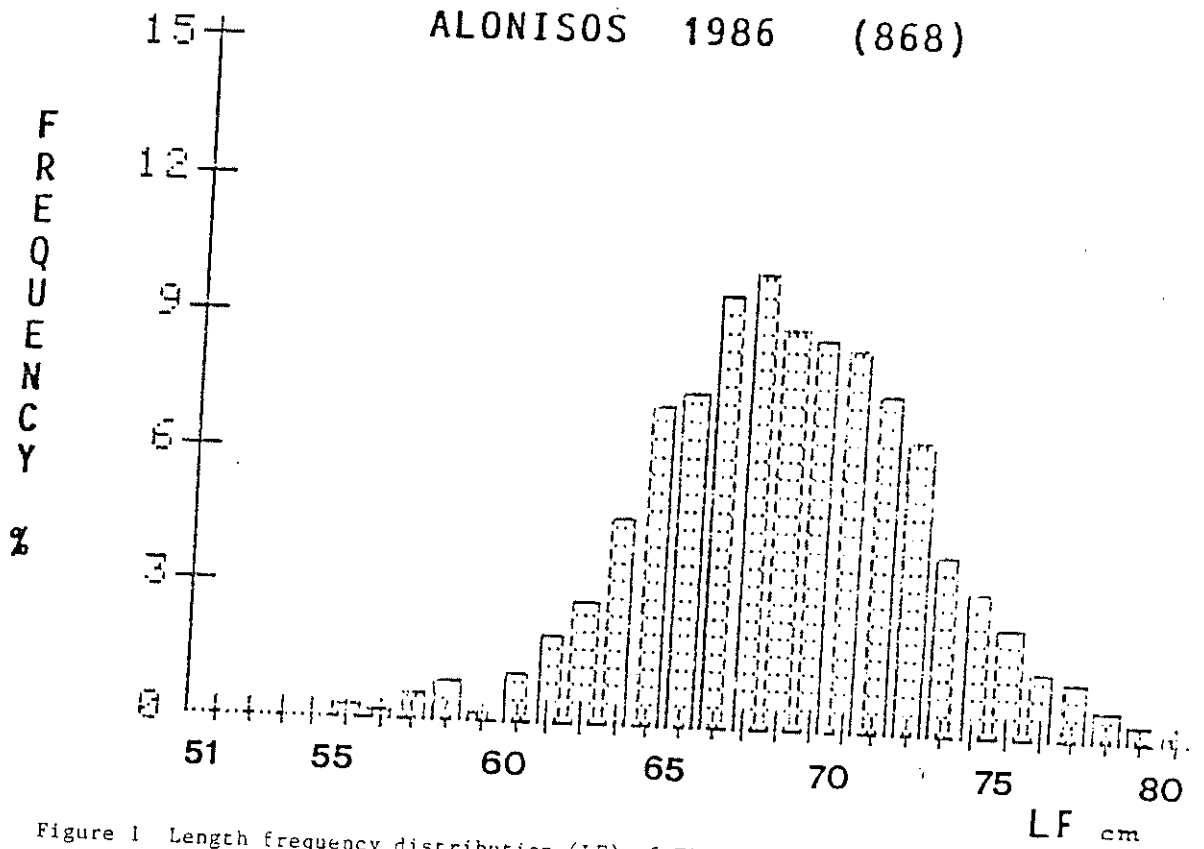


Figure 1 Length frequency distribution (LF) of Thunnus alalunga. Alonisos fishery, 1986

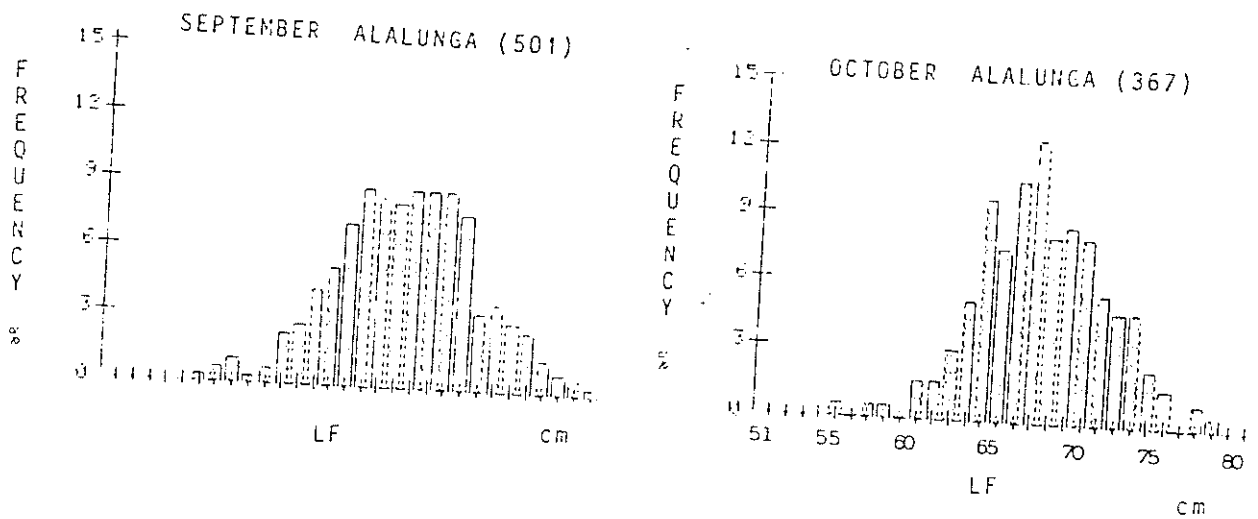


Figure 2 Length frequency distribution (LF) of Thunnus alalunga in the months of September, October. Alonisos fishery, 1986