

ICES C.M. 1996

CM 1996/S:10

Theme Session: S (SEFOS) Poster

**RESULTS OF A TAGGING SURVEY OF MACKEREL  
IN THE BAY OF BISCAY IN 1994**

by

Andrés URIARTE (1) and Paulino LUCIO (2)

1- AZTI, Avda. Sarrástegui nº8, 20008 San Sebastián, Gipuzkoa, Basque Country, SPAIN

2- AZTI, Isla de Txatxarramendi s/n, 48395 Sukarrieta, Bizkaia, Basque Country, SPAIN

**ABSTRACT**

Ten thousand mackerels were tagged in March and April 1994, in front of the Basque Country (Spain), at the East part of Division VIIIc, close to the boundary between the, by then called, southern and western stocks within the frame of the SEFOS project (EC, DG XII). The purpose of this experiment was to improve the knowledge about the major migration patterns of the mackerel along the European continental shelf edge. Recaptures have been recorded along the western coasts of Europe, from the North West of Spain to the Norwegian coasts. These results connected the fisheries of the Southern and Northern areas and put in doubt the existence of two separate stocks in these regions. The fishery on spawning mackerels that takes place at the east and central Cantabrian sea in the first half of every year is made on mackerels coming from the Western area which would extend their southward spawning migration through ICES Division VIIIc, before going back to North.

# RESULTS OF A TAGGING SURVEY OF MACKEREL IN THE BAY OF BISCAY IN 1994

by

Andrés URIARTE and Paulino LUCIO

AZTI, Instituto Tecnológico Pesquero y Alimentario

Avda. Satrustegui nº8, 20008 San Sebastián, Gipuzkoa, Basque Country, SPAIN

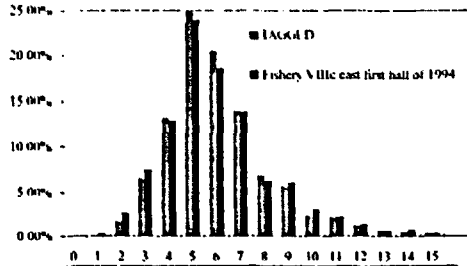
## 1- INTRODUCTION

Within the frame of the SEFOS project a mackerel tagging survey was performed in spring 1994 in the waters in front of the Basque Country (Spain) where the, by then believed to exist, western and southern stocks were supposed to split, in order to improve the knowledge about the migration patterns of the European mackerel

The southern stock was assumed to exist around the Atlantic coasts of the Iberian peninsula although there were no sufficient biological basis for this (Anon. 1992, 1995). The migration pattern of southern mackerel was not understood. The southern fishery is based on spawners caught during the first half of the year in Subdivision VIIIc east (Villamor et al. 1996), but those adults disappear from the southern area during the second half of the year (Anon. 1996).

## 3- RESULTS and DISCUSSION.

Surveyed mackerels were sexually mature adults, at spawning time, with an average GSI of 11 % (CV=38 %), Of similar length and age composition to those landed by the commercial Basque and Cantabrian fisheries (Anon. 1996).



First recaptures suggest an initial westward migration of mackerels along Cantabrian sea. Tagged mackerels were probably representative of those caught by the Cantabrian fishery (i.e. representative of about 65-75 % of the annual catches of the southern area).

## 2- TAGGING SURVEY

Vessel: R/V OBELIX, a small 15 m long vessel

Dates: From 11th of March to 22nd of April, 1994.

Fishing gear: handlines of 6-8 hooks; red cotton yarn as bait.

Purposes: Tagging 10.000 mackerels:

7.500 with external tags, type plastic TBA-2 anchor tag.

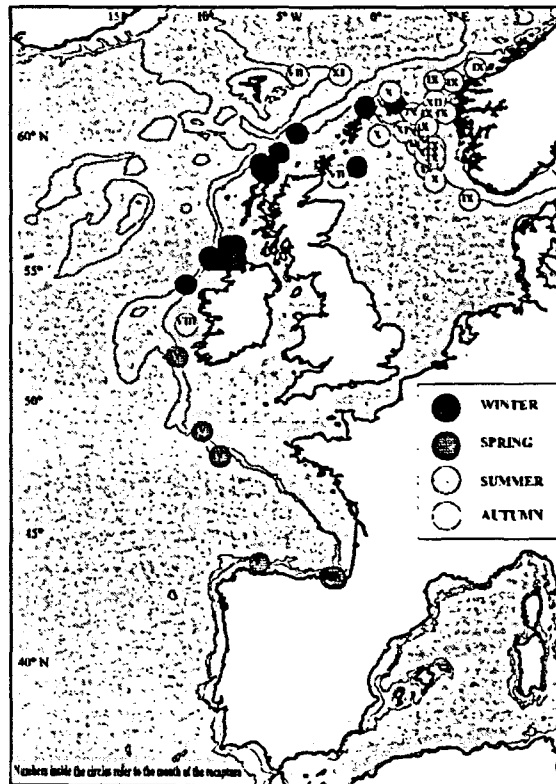
Tagging pistols type Monarch 3030 long needle guns.

2.500 with internal steel tags, size: 20x4x1 mm. (Hoff et al. 1988).

Inserted with the "Gundersén tagging pump" (Myklevoll, 1994).

Area:

## COMPLETE RECAPTURES (up to September 1996)



## SOUTHERN AND WESTERN MACKEREL ARE CLOSELY RELATED

The tagged southern adult mackerels were caught in summer, autumn and winter by the western fishery at the northwest of Europe, being there exploited more intensively than at the southern area. Therefore southern mackerel has a parallel migration along the shelf edge as the one described previously for the western mackerel (Eaton's 1978, Rankine and Walsh's 1982, and Lockwood 1988), and their fisheries are connected. However, the results indicate a further southward spawning migration in spring, up to the south of the Bay of Biscay.

The extension of the southward spawning migration of the mackerels to the west of Europe, along ICES Division VIIIc, provides a simple explanation to the strong seasonality of the southern fisheries on adults and to the disappearance during the second half of the year from that area.

The recaptures of southern spawning mackerels obtained in April of the following years to the west of Ireland and northern part of the Bay of Biscay, i.e. during peak spawning season and at the major spawning grounds of the western area, suggest a mixing of spawners of the southern and western areas.

## 4- CONCLUSIONS:

1) The fishery on spawning mackerels that takes place at the east and central Cantabrian sea in the first half of every year is made on mackerels coming from the Western area which would extend their southward spawning migration through ICES Division VIIIc, before going back to the North.

2) The mixing of the western and southern fisheries and of the spawners from both areas suggest that it is scientifically more consistent to assume a single stock at the western coasts of Europe (excluding the North Sea) than staying at the 1994 "status quo" assumption of two different stocks.

## MIGRATION PATTERN OF A SINGLE STOCK OF MACKEREL AT THE WEST OF EUROPE



## Acknowledgements and References:

This work has been partly sponsored by the Department of Industry, Agriculture and Fisheries of the Basque Government of the Basque Country (Spain) and by the Commission of the European Communities (DC-VIII) within the frame of an International EC AIR Project entitled "Shell Edge Fisheries and Oceanography Studies" (SEFOS project) AZTI want to express its special gratitude to the Institute of Marine Research at Bergen for the large amount provided in the preparation of the tagging survey, especially to Sigmund Myklevoll, I.H. Arkstrand and S. Fransen. We are also indebted to Michael and Noah Hall (HALL PRINTS), Marine Watch (Marine Laboratory, Aberdeen, Scotland, U.K.), A. Looney (MIAF, Scotland, U.K.), F. Perez P. Abonada, B. Villamor et al. (ICES Spain), P. Presset, S. Mousaco, A. Mousaco (P. R. IRELAND), Francisco J. Millán (Laboratory Research Centre, Belgium), G. Bour (ICL, CHL), J. Verbeke (D. B. S. I.), S. Perelman (P. M. B.), Perelman, Van Der Pijpen (Labo Institute for Fisheries and Marine Research) and with all the European fishermen who reported recaptures. Much of the research and of this research is due to the support of the AZTI team (I. Uria, L. Murua, L. A. Murua, L. Murua, J. M. Gonzalez, C. Frutkin, J. Alvarez).

REFERENCES  
Anon. 1992. Report of the study group on stock status of Mackerel and Herring Mackerel. ICES Doc. C.M. 1992/H.4  
Anon. 1994. Application procedures for fish tagging. HALLPRINT (interim)  
Anon. 1995. Report of the Working Group on the assessment of mackerel, herring and anchovy. H.F.S. Doc. C.M. 1995/Annex 2 (The Assessment part revised in 1994)  
Anon. 1996. Report of the Working Group on the assessment of mackerel, herring, mackerel, sandeel and anchovy. H.F.S. Doc. C.M. 1996/Annex 1 (This is the Assessment part revised in 1994)  
Eaton D.B. 1978. English Mackerel tagging experiments in 1974. *Marine Fisheries*, 15: 214-214  
Hall I.H. 1984. *Parasites of Fishes*. Chapman & Hall, London, 390 pp.  
Eaton D.B., Lenoir A.A., Seix E., Millán and F. Fransen. 1993. Mackerel (*Scomber scombrus* L.) egg production and stage I egg production efficiency on Devon and North Devon. ICES Doc. C.M. 1993/H.44  
Lockwood S.J. 1988. *The Mackerel: Its biology, assessment and the management of a fishery*. Fishing News Books Ltd. London, Surrey, England, 181 pp.  
Myklevoll S. 1994. *Development of the mackerel tagging experiment and procedures* (interim).  
Rankine P.A. and Walsh J. 1982. *Tracing the movements of North mackerel*. *Inter. J. Fish. Mgmt.* 1: 47-63  
Villamor B., C. Perelman and P. J. M. 1994. Distribution and seasonality of mackerel (*Scomber scombrus* L.) in the Cantabrian Sea and Atlantic waters (ICES Division VIIIc and Sub-Division VIIIc North). ICES Doc. C.M. 1994/VIII.10 pp.7