

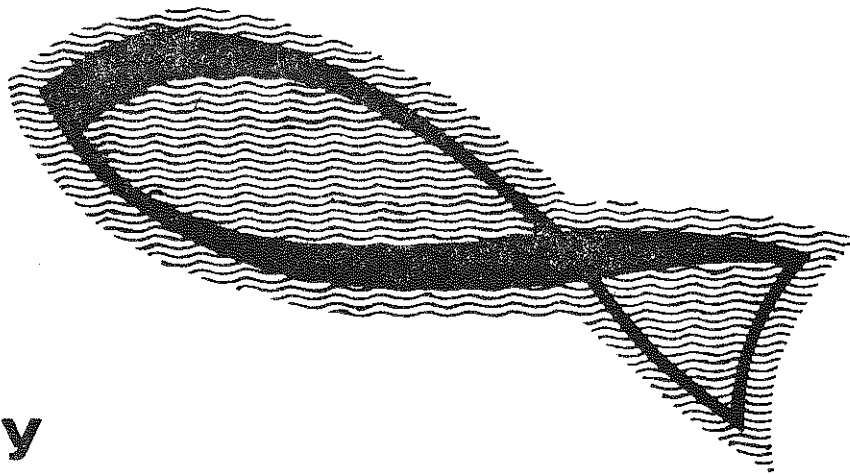


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**Some comments on the management
of the Irish mackerel fishery**



by

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Some Comments on the Management of the Irish Mackerel Fishery

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INTRODUCTION

The total Irish catch of mackerel has increased dramatically in recent years and has risen from about 1000 tonnes in 1970/71 to approximately 50 000 tonnes in 1980/81. The total international catch taken by all countries in the ICES divisions VI, VII and VIII (Fig 1) has also increased dramatically in the same period and has risen from 104 000 tonnes in 1970 to 604 000 tonnes in 1980.

In 1980 mackerel contributed 40% of the total weight of the Irish wetfish catch and about 18% of the total value (based on the official statistics). Fishermen and processors have, in recent years, invested heavily in new vessels and in processing facilities, on the assumption of a continuation or even possible expansion of the recent high levels of mackerel catches. At the same time it is realized that pelagic fisheries such as herring and mackerel are liable to produce extremely erratic yields when intensively fished and there is always the danger of a sudden collapse of the fishery as has happened in many of our herring stocks.

It is therefore important that those engaged in the mackerel fishery should be aware of the latest information relating to the assessment of the mackerel stock and also of the objectives as to how the stock should be managed.

ASSESSMENT OF THE MACKEREL STOCK

Before it is possible to assess either the size of any particular stock or to examine the way in which it reacts to fishing it is necessary to understand where and how the stock is distributed. This means a knowledge of the time and location of spawning, the nursery areas of the young fish, the feeding, and the distribution of the feeding and the overwintering grounds. Knowledge like this is fairly easily acquired for demersal species which do not make large migrations and also for some herring stocks for which the migration pattern is understood. However in the case of mackerel the investigation is extremely difficult. Large scale tagging experiments have shown that mackerel move from

the Celtic Sea along the west coasts of Ireland and Scotland into the North Sea and vice versa. Huge fisheries now take place to the north and west of Scotland, off Donegal, off our west coast, south of Castletownbere and off Cornwall. The relationship between the shoals which are exploited in these fisheries is still being interpreted. Spawning appears to take place mainly across the Celtic Sea and English Channel but also occurs off the Northwest of Ireland. Shoals appear to overwinter off Cornwall but may also do so to the southwest of Ireland. In addition the relationship between the mackerel fished in the Bay of Biscay and the rest of Division VIII and the stocks fished in Division VI and VII (see Figs 2 and 3) is not understood.

It is obvious therefore that one of the essential elements for accurate stock assessment, a knowledge of the location and distribution of the stock throughout its life cycle, is not completely understood.

A second essential element necessary for stock assessment is an accurate estimate of the total catch removed from the stock each year. Until recently it was believed that the figures for total international catches reported were reasonably accurate. However in recent years the imposition of catch restrictions and national quotas have led to extreme difficulty in obtaining accurate figures of actual catches because of the danger of countries appearing to exceed their allocated quota. In 1980 over 100 000 tonnes of mackerel were estimated to have been landed in excess of the total figures recorded by each country. Furthermore many catches are now transhipped directly at sea, with the actual fishing vessel never coming into port. The difficulty in obtaining reliable total catch figures is further aggravated by the enormous quantities of mackerel which are caught but never subsequently landed - either because the catch is lost through damage to the net or because the catch is dumped when the fish are too small or when the market has been glutted. The amount of fish dumped or discarded for these reasons is estimated to be as high as 8% to 10% of the total international catch taken in the winter in sub division VIII off Cornwall. There is also considerable difficulty in obtaining details of the actual grounds from which the fish have been taken - particularly from Continental fleets which fish over very large areas and move quickly from one fishing ground to another.

It is however imperative, because of the enormous catching capacity of the international fleets and the rapid increase of the catches in recent years, to improve the accuracy of the stock biomass estimate. It is also desirable that the fisheries are regulated according to the best estimates currently available.

At the moment it is assumed that the mackerel found in ICES Divisions VI, VII and VIII belong to the one stock. This is known as the "Western Stock" and it is considered to be biologically separate from the North Sea stock although considerable mixture takes place between the two. Two main methods have been used to estimate the size of this Western stock. Intensive international egg surveys have been carried out over the spawning areas in 1977 and 1980. These surveys estimate the numbers of eggs produced during the spawning season. Since the numbers of eggs produced by an average female mackerel is known, and also the sex ratio in the stock, it is a simple matter to calculate the number of fish present in the parent stock at the time of spawning. The areas surveyed were mainly along the edge of the continental shelf from the north coast of Spain to the west of Ireland and across the Celtic Sea. The total spawning stock estimated as a result of the 1980 survey was about 1.8 million tonnes. This does not include the quantities of small immature fish which together with the total spawning stock would make up the total stock.

Using the estimate of spawning stock size in 1980 as 1.8 million tonnes and the actual catches in the preceding years (expressed as the numbers of fish caught in each age group), it is possible to back calculate both the size of the stock in each year and also the fishing mortality generated in that year by the catch. This exercise indicates that the spawning stock has decreased from over 3.5 million tonnes in 1973 to the present level of 1.8 million tonnes. During the same period the fishing mortality has increased to a level which is more than double that of 1977. This decline in stock is partly due to the very low level of recruitment of the mackerel which were spawned in 1977 - in which year the spawning appears to have been almost a complete failure. The very high catches in recent years appear to have been maintained solely because of very high recruitment which took place in 1976 and 1977.

MANAGEMENT

Attempts to regulate the fishery have been made since 1976 and in each year since then an optimum catch has been recommended by the Advisory Committee of ICES on Fisheries Management (ACFM). It is interesting to compare the advised catch levels with the actual catch, and the total spawning stock which was estimated for that year. The figures are as follows:-

Year	Tonnes ('000)		
	TAC	Actual Catch	Spawning Stock
1976	412	507	3314
1977	289	326	2666
1978	535	504	2562
1979	520	601	2258
1980	354	605	1786
1981	353	?	1800?
1982	269	?	1800?

As can be seen the reported catches in recent years have been nearly double the advised catch and during a period when the catches have increased significantly the spawning stock has fallen dramatically.

Present catches cannot be maintained as long as the stock is falling and it is important therefore, that this decline should be arrested and the stock rebuilt to the pre-1975 level. The quickest and most effective way to effect this would be to

- (i) Adhere to the scientifically advised TAC.
- (ii) Eliminate the catches of immature mackerel which are taken each year off Cornwall in sub division VIIe.

As has been pointed out before by various ICES assessment groups a continuation of the

catches of young mackerel in subdivision VIIe will lead to a very rapid decline in stock size. The elimination of these catches and strict adherence to the TACs will lead to an increase in stock size in the whole of the western area. One way to eliminate the catches of immature mackerel would be to impose a minimum landing size limit of 30cm throughout the whole of the western area. It will then be possible to allow the catches to return to their present level provided that they do not include large quantities of juvenile fish. To ensure this, the fishery should be conducted in areas to the west of Scotland and Ireland where large mackerel are available during Autumn and Winter. This would lead to an immediate increase in effort in those areas.

The mackerel fishery is now vitally important to the whole Irish fishing industry. The management of this fishery therefore deserves serious consideration by the people concerned. Apart from the adherence to the TAC, the other policies advocated such as the imposition of a 30cm minimum size and the changing of the whole main centre of the fishery from the winter months in subdivisions VIIe and VIIg - k off Cornwall and the Celtic Sea to subdivision VIIe and VIa off the West coasts of Ireland and Donegal, would, if implemented, create a diversion of effort to these areas. The emerging Irish fleet would be faced with severe competition from continental fleets and it will be important, in the immediate future, to ensure that the Irish share of a reduced TAC is maintained at a high level. If the management policies are successful, resulting in a rebuilding of the stock and a consequent increase in the TAC, the Irish share of this TAC would be increased. This would permit a further increase in the Irish mackerel catch and provide additional supplies to the processing industry.

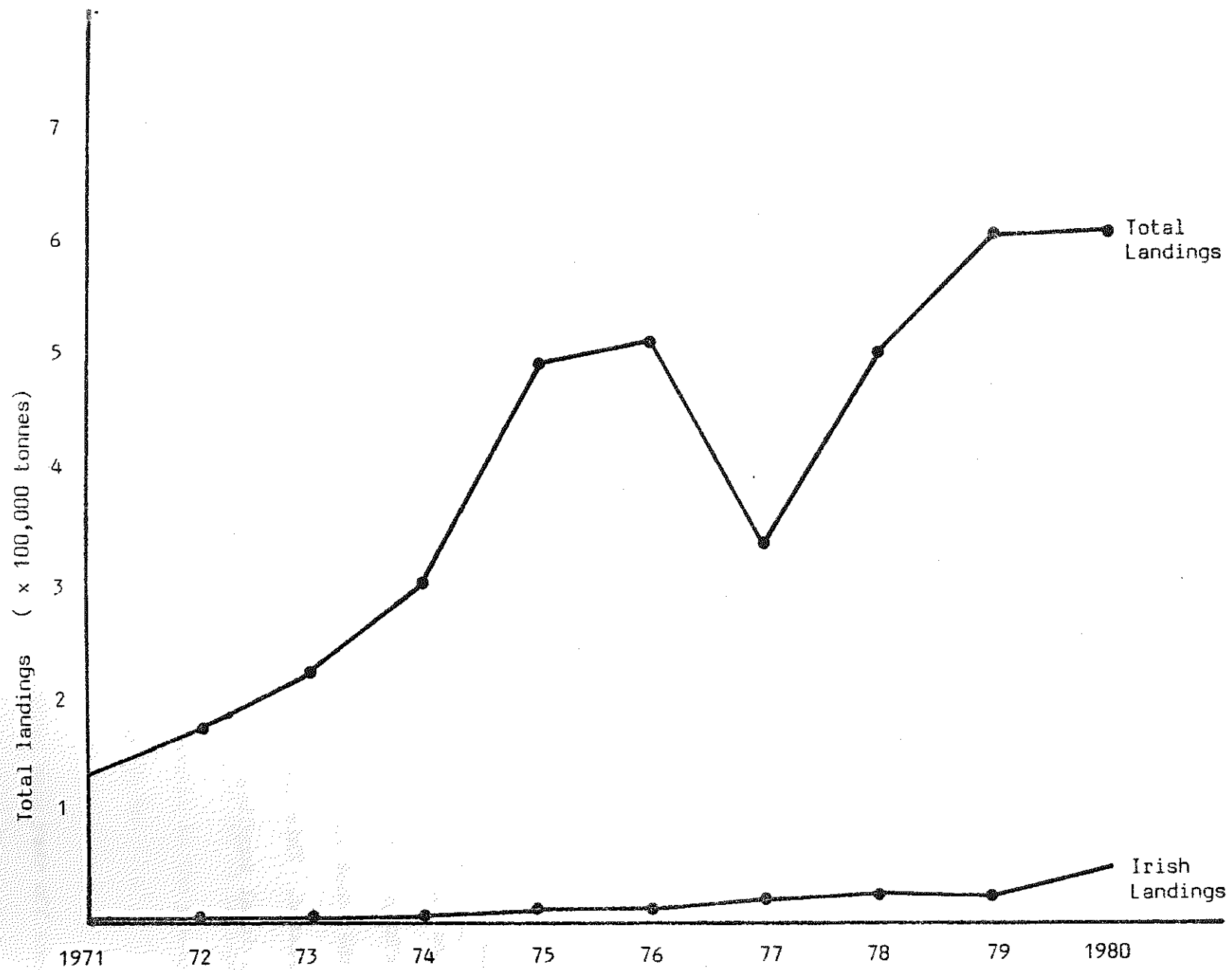


Fig. 1 Total landings from "Western" mackerel stock.

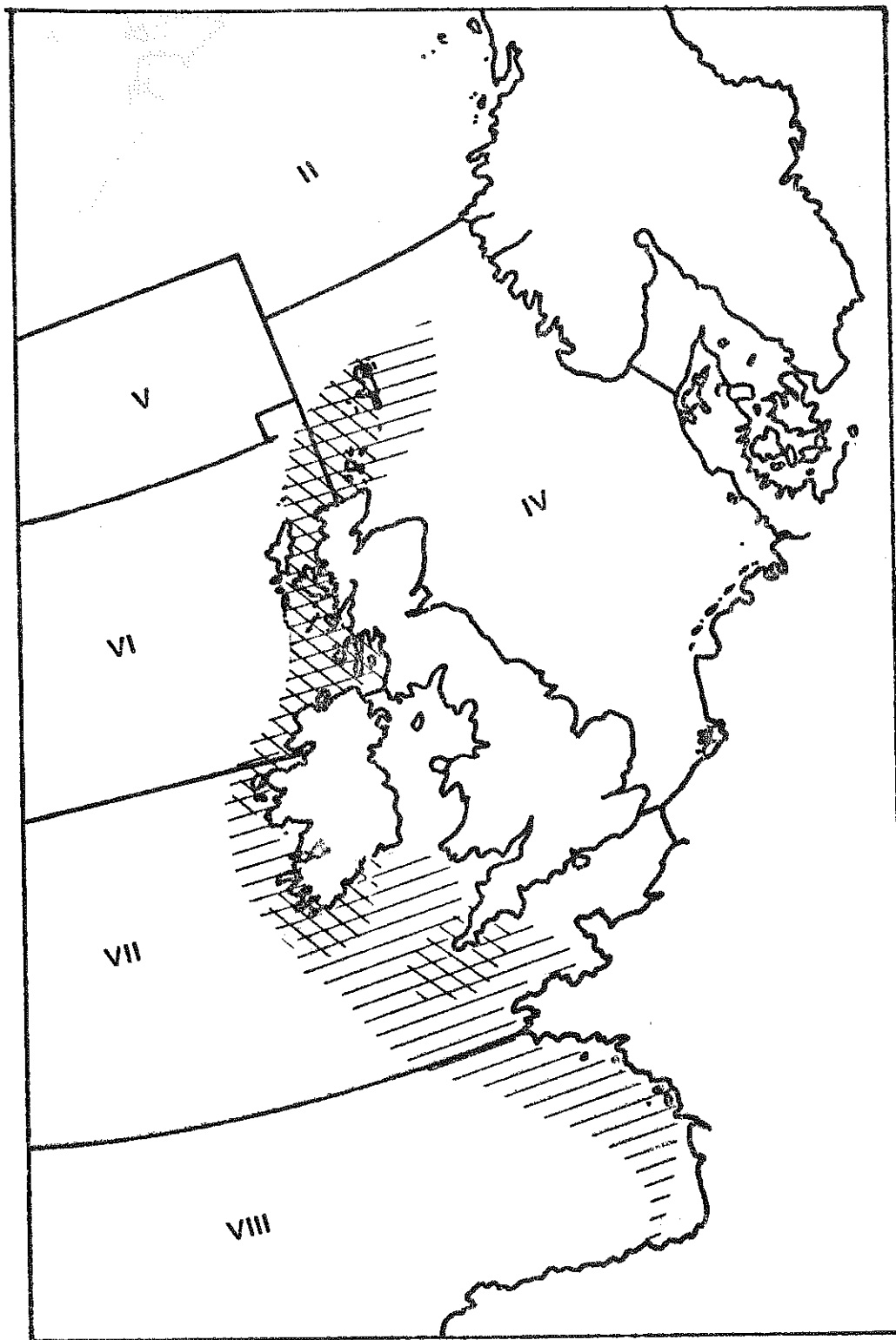


Fig. 2 Mackerel: western stock distribution shaded; main fishing grounds cross-hatched; ICES Divisions indicated by Roman figures.

