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The Statistical Requirements of the  
International Commission for the  
Northwest Atlantic Fisheries

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THE STATISTICAL REQUIREMENTS OF THE  
INTERNATIONAL COMMISSION FOR THE  
NORTHWEST ATLANTIC FISHERIES.

By W.R. Martin \*

Provision for the investigation and conservation of the fishery resources of the Northwest Atlantic Ocean was made in 1949 by the International Convention for the Northwest Atlantic Fisheries. The Convention, which entered into force in 1950, resulted in the organization of the International Commission for the Northwest Atlantic Fisheries in 1951.

The Commission is responsible for obtaining and collating the information necessary for maintaining those stocks of fish which support international fisheries in the Convention area. Fisheries statistics are essential to this responsibility, for they form the basis for recognizing changes in yield and abundance. Good statistics, together with an understanding of the factors responsible for their fluctuations, will provide the means of predicting and controlling the catch.

MINIMUM STATISTICAL REQUIREMENTS.

Catch statistics must be collected in relation to area fished, species and sizes caught, fishing effort, and proportion landed if they are to be of real value to the Commission. The minimum statistical requirements of the Commission are discussed briefly in order to point out the importance of basic commercial statistics to the work of the Commission.

Area fished.

The Convention area has been divided into five sub-areas, each of which is a relatively distinct biological unit (sub-area 1 - West Greenland; sub-area 2 - Labrador; sub-area 3 - Newfoundland, including Grand Bank; sub-area 4 - Canadian east coast other than Newfoundland, including banks off Nova Scotia; sub-area 5 - New England, including Georges Bank). The sub-areas correspond in general with the International Statistical Areas XV to XXII which were defined by the North American Council on Fishery Investigations in 1931.

Panels have been established for each sub-area and each of these panels is responsible for keeping under review the fisheries of its sub-area, in order that it may make reports and recommendations to the Commission. It is essential, therefore, for the work of the panels, to break down the commercial fisheries statistics in relation to sub-area fished.

Species

The fishes under consideration by the Commission are the cod group (Gadiformes), flat-fishes (Pleuronectiformes), and rosefish (genus Sebastes). It is important to the purposes

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\* This paper presents the personal views of the Acting Executive Secretary of the Commission concerning the development of Commission statistics, and they do not necessarily represent the

of the Commission to divide the statistics by species for at least the five principal species landed. Species other than cod are becoming increasingly important in commercial landings, and standardization of the common names used for each species is needed. This can perhaps best be done by referring each common name to its scientific name.

#### Sizes.

A record of changes in the size composition of fish landed is useful to the fisheries biologist for a consideration of the relationship between sizes landed and fishing intensity. The more important species are commonly culled by sizes as they are landed, and a record of landed weights by these commercial size categories provides a useful index of changes in fish stocks. These data must be considered in relation to fishing gear because of differences in gear selectivity for size.

#### Fishing effort.

Statistics of landings are of greatly increased value when they are considered in relation to fishing effort. Catch per unit of effort is related to abundance, and knowledge of abundance is of primary importance to the Commission. It is of interest to maintain abundance at a level which will permit the maximum catch with a minimum expenditure of fishing effort. Catch per unit of effort decreases as catch increases and it is desirable that the total catch should be at the highest level which still permits profitable fishing.

Indices of fishing effort which may be used in relation to catch are days absent from port, and days or hours fished. In line fishing it is useful to know the fishing effort in terms of dory days or hours, or in terms of standard units of fishing effort, such as lines fished.

Catch-per-unit-effort data must be considered in relation to type and size of gear used. Otter trawling, pair trawling, hand lining, and long lining are methods of fishing commonly used, and other methods such as purse seining or Danish seining might be introduced. In addition to this variation in type of fishing there are large differences in vessel size. Otter trawlers, for example, vary in size from less than 50 to 1,500 gross tons. It will be useful to develop a simple classification of fishing equipment in order to divide these various types and sizes of gear into standard units for statistical purposes.

#### Catch not landed.

Large quantities of fish are caught and discarded at sea, for the marketability of the catch varies widely both with species and size of fish. The amount of fish discarded at sea varies with landing port, season, year, relative abundance, and relative market value of the fish taken. The majority of fish caught will not live if discarded at sea and these discards often reach appreciable quantities. Since it is desirable to avoid catching fish that are not wanted for landing, it is particularly important to obtain estimates of the quantities of fish caught but not landed for each of the principal species.

### INADEQUACY OF PUBLISHED STATISTICS.

The published statistics of the fisheries in the Convention area are inadequate for the purposes of the Commission since they are neither complete, current, nor equivalent.

Summaries of the catch of cod and haddock from the Northwest Atlantic area have been attempted with some success, but these have not been sufficiently complete to meet Commission requirements. Some of the countries have not published statistics of their landings from the Northwest Atlantic Ocean, and the statistics that have been published can be divided by sub-area only in part. In many cases landings have been recorded by species groups such as 'Cod and related species' rather than by species, and only rarely are they sub-divided by size categories. Information concerning fishing effort is generally poor and records of fish caught but not landed are lacking.

Statistics must be available over a long period and they must cover current fishing operations if the Commission is to be well informed concerning the status of each fishery in relation to long-term trends. To date the compilation and publication of fishery statistics has tended to lag a few years behind current operations.

Records of landings have not been equivalent either in units of measure or condition of fish weighed out. Landed weights have been recorded in pounds, hundredweights (100 or 112 pounds), quintals, kilograms, and metric tons, and the fish landed may be either green salted, round fresh, head-on gutted fresh, head-off gutted fresh, or frozen fillets. In some cases the condition of landed fish has not been stated or even wrongly stated in the statistics. The green salted fish vary widely in the degree of dryness because of the variability of such factors as amount of salt used and length of time between salting and landing. In the compilation of statistics for the Convention area there is clearly a need for a thorough study of this aspect of the statistical problem, in order that statistics may be converted to common standards for analysis and publication.

### AVAILABILITY OF BASIC STATISTICS.

There appears to be a good possibility of obtaining the basic statistics required by the Commission for current fishing operations in 1952, and in many cases some of these statistics can be compiled for a number of back years.

#### France, Italy, Portugal and Spain.

Fishing operations from the southern group of European countries are conducted for the most part with large vessels. The number of vessels is not great, the number of trips per year is small, and the landing ports are few in number. These circumstances make the compilation of requisite statistics a manageable problem.

Records of weights landed, supplemented by information from the logs of fishing captains, can be summarized on trip records for each landing. The fishing companies which operate these large vessels have kept good records of their fishing operations, and these can be used for the compilation of statistics for recent years. Compilations of some of these back statistics have already been made available to the Commission.

Denmark, Iceland, Norway, and the United Kingdom.

The northern group of European countries has been particularly concerned with the fishing of the Greenland sub-area. Good records of fishing operations have been collected, and these are being compiled in accordance with Commission requirements.

Canada and the United States.

Statistics are more difficult to collect from countries bordering on the Convention area since the numbers of boats, fishing trips and landing ports are very large. The problem of collecting statistics is being tackled by dividing fishing operations into inshore small-boat and offshore large-boat groups.

Landings by the inshore group may be assumed to come from the fishing area adjacent to the landing port, and the inshore statistics are being allocated accordingly. Annual statistics of landings by species and sometimes sizes are available by geographic groups rather than by individual boat units and this is satisfactory for Commission purposes. Statistics of inshore catches in Newfoundland will be the most difficult to obtain because of the isolation of fishing communities, but progress is being made through the establishment of a system of periodic surveys.

Statistics of offshore landings are continually improving. Detailed statistics of the type required by the Commission have been compiled for certain New England ports for many years. It is anticipated that these statistics will be reviewed and expanded in order that the Commission may have a good record of the total United States fishing in the Convention area. In the Canadian Atlantic provinces other than Newfoundland, offshore landings have been separated from inshore landings in the annual published statistics since 1918, and in more recent years attempts have been made to break down these offshore statistics in the form required by the Commission. It is anticipated that these detailed offshore statistics will soon be available to the Commission. Arrangements have now been made to introduce a similar offshore statistical collection system to Newfoundland.

A beginning has been made at the collection of information concerning fish caught but not landed, but these statistics are not as yet well developed.

It is apparent that the fishery statistics available from Canada and the United States will soon meet the minimum requirements of the Commission.

### STATISTICAL PUBLICATION.

In order that complete, current, and equivalent statistics may be readily available to the Commission it is believed that the statistics of the fisheries in the Convention area should be compiled, published and disseminated by the Commission. The responsibility for the collection of statistics should, however, rest with the Contracting Governments. Close liaison must be maintained between the fisheries statisticians of Contracting Governments and Commission headquarters in order that adequate statistics may be available at all times.

### CO-OPERATION WITH OTHER INTERNATIONAL ORGANIZATIONS.

Close co-operation between the Commission and other international organizations, particularly the Food and Agriculture Organization of the United Nations, is essential in the field of fisheries statistics. It is important in the first place to avoid duplication of effort in the compilation and publication of statistics. Secondly, there should be co-ordination of effort in the collection of statistics from Governments in order to avoid unnecessary duplication of effort in Government Fisheries Departments. Finally there should be co-operation in the work of standardization of fish names, standardization of units of weight measure, investigation of conversion factors for various conditions of landed fish, and classification of fishing gear on the basis of fishing efficiency.

### SUMMARY.

To sum up, the statistical requirements of the International Commission for the Northwest Atlantic Fisheries include landed weights by sub-area, species, sizes, years and fishing effort, together with estimates of quantities caught but not landed. These statistics must be complete, current, and equivalent to meet Commission requirements.

Existing published statistics are inadequate for the purposes of the Commission. The basic statistics required by the Commission which are available from Contracting Governments should be compiled and published by the Commission.

The development of Commission statistics will benefit from the co-operation of other international organizations which have related objectives, particularly the Food and Agriculture Organization of the United Nations.