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[1. Progress report of the working group on
Arctic fisheries]

WORKING GROUP ON THE DYNAMICS OF ARCTIC COD

DATA REQUIRED FOR MEETING OF EXPERTS FROM U.S.S.R., U.K., GERMANY
and NORWAY, IN BERGEN, SPRING 1959.

A. PREAMBLE

- (i) It is accepted that the main objectives of the working group and the methods to be used will be broadly those proposed in the Progress Report on the Arctic cod submitted by Beverton and Sætersdal to the Gadoid Committee of I. C. E. S. at the 1958 meeting. Further, the experts of the countries concerned were able to talk together during the Dublin Meeting of the Permanent Commission, and were in substantial agreement as to the way the problems will have to be tackled and the information that will be required.
- (ii) This note is therefore intended simply as a reminder of the data that the meeting will require, if the best use is to be made of this opportunity of bringing together the experts from ^{the/} four countries. It is appreciated that much of the material listed below has already been published in one form or another, but for the special needs of the meeting some of this may have to be presented in more detail or in a different form.
- (iii) The data listed below refer in the main to cod, but should be duplicated for haddock as far as possible since further regulation in the Arctic will have to take account of both these fisheries. It may also be that redfish, coalfish and plaice will have to be considered before the task of the working group can be said to have been completed, and it may be thought desirable for countries to submit such relevant data as they may have on these three species at this stage, even though there may not be time at the April meeting to consider them in detail.

B. BASIC DATA

- (i) Length compositions
 - (a) These may either be "as caught", from measurements at sea on Research Vessels or commercial ships, or "as landed" from market measurements. In the latter case, information on rejection at sea should be supplied wherever possible, so that ultimately all data can be adjusted to "as caught" as a common basis.
 - (b) It is suggested that length compositions should be presented as "per mille" in the first instance, and also as "total numbers caught" if this is possible. Length compositions in the form of "numbers caught per unit effort" will

also be needed at a later stage, but it may be better to do this at the meeting after there has been an opportunity of deciding on the best measures of effort which are available for the various areas and periods.

- (c) The length data should be presented in tabular form in 5 cm. groups (e.g. 30-34, 35-39 cm.).
- (d) The data should be grouped by I.C.E.S. sub-regions (i.e. Region I, IIa and IIb) or by smaller areas where relevant (but see (iii) and (iv) below).
- (e) The data should be for all available years from 1930 onwards.
- (f) If more than one type of gear is involved (as in the case of the Norwegian data), length compositions should be given for each gear separately. For trawl data, an indication of the mesh size used would be helpful, and also of whether the data include catches taken in a smallmeshed cover.
- (g) Length/weight conversions are needed for all three areas.

(ii) Age-compositions

- (a) These may either be the actual age-composition obtained by direct random sampling for age, or in the form of "age-length keys", i.e. the % age-composition for each 5 cm. length group (e.g. 30-34, 35-39 cm.). As far as possible both kinds of age-data should be supplied, because age-length keys may make it possible to convert length-compositions to age-compositions where direct age-sampling is not available.
- (b) The above suggestions (except (c) and (g)) for the presentation of length compositions apply equally to the presentation of age-compositions in tabular form, and should be followed as far as possible.
- (c) A special feature of the age-data for mature fish is the presentation of the material by spawning classes instead of year-classes, which is likely to be the form most suitable for mortality estimation in the skrei fisheries.
- (d) For the purpose of standardising the age-data all countries are asked to use January 1st as the changeover data from one age group to the following.
- (e) Growth data, Mean length of age groups and/or growth calculations from scales should be given separately. Splitting on subregions (I, IIa and IIb) and on seasons of the year is recommended. These data should refer to some of the later years (since 1950). Special studies of variations of growth rate including earlier observations may, however, also be useful. (See C (iii) Miscellaneous).

(iii) Catch statistics

- (a) Total annual catch (by species) should be provided for the I. C. E. S. sub-regions for as many years as possible.
- (b) If either length or age-compositions are given by smaller areas than these, catch statistics for the corresponding areas would be helpful.
- (c) Where more than one type of gear is involved, the catch statistics should be given for each gear separately.
- (d) Catch statistics should refer to fish "whole (as caught)" as far as possible. If this cannot be done, the condition of the fish should be stated (e.g. gutted, headed, salted etc.) and appropriate factors supplied for conversion to "whole weights" where possible.

(iv) Effort statistics

- (a) Statistics of fishing effort should be given for as many years as possible, by the same areas as for total catch.
- (b) Where more than one type of gear is involved indices of fishing effort appropriate to each gear should be used.
- (c) If it is known that the power of the unit of effort has changed over the years, an indication of this would be helpful (e.g. a change in the average tonnage of trawlers).

C. SUPPLEMENTARY DATA

(i) Gear selectivity

In view of the work on gear selectivity at present being undertaken by all the countries concerned, and in particular, that which is planned for the International Comparative Fishing Experiments in August 1959, it is not expected to reach any definite conclusions on this subject at the April meeting. Nevertheless, it may be thought that this meeting would be a suitable occasion for those countries which already have some selectivity data to present these in summary form, so that future work can be planned having regard to the results which have been obtained so far. If this is agreed, a suitable form of presentation of selectivity data would be the actual numbers of fish caught at each length and the % retained in cover (if one is used) together with other relevant data (mesh size etc.).

(ii) Tagging data

Although all three countries have undertaken extensive tagging work in the past, some of this is unlikely to be suitable for stock assessments. This applies

particularly to the tagging of trawl-caught immature cod, which for the most part has given disappointing results. On the other hand, the tagging results on mature fish, especially those of Norway, may play a vital part in estimating mortalities and in distinguishing true difference in gear selectivity. It is therefore suggested that countries should submit any tagging data which they think would be helpful to the working group, presenting this in the form most appropriate to the circumstances. For example, numbers liberated by size groups in each year and area, and subsequent recaptures by size-groups, gear, year and area would be a useful basis for presentation.

(iii) Miscellaneous

It is recognised that there are certain kinds of information other than are covered by the above list which may be helpful to the working group and it is hoped that any country that wishes to submit other relevant information to the working group will not hesitate to do so. This might include biological material relating to the onset of maturity as a function of length, changes in growth rate etc. or information on environmental changes which have a clear relevance to the interpretation of the causes of changes in the stocks.

D. PREPARATION AND CIRCULATION OF DATA

Since it will be possible for the experts to meet together for a few days only, it would be desirable for as much as possible of the material to be made available to participants before the meeting.

I would therefore suggest that (4) copies of all data be submitted to me at Bergen as soon as it has been prepared, where upon I will distribute a copy to each of the other participants.

In view of the fact that there is not a great deal of time remaining, it may be best for participants to send in material in say, two or three batches as it comes ready, rather than to delay sending any until the whole of the contribution is complete. It might also be of help in this connection to mention that, as it happens, each country can make a contribution of particular importance to a certain aspect of the whole subject. Thus the U.K. has concentrated her research in the Bear Island and Spitsbergen areas, while the U.S.S.R. has paid more attention to the Eastern Barents Sea - Norway, of course, has been mainly concerned with the fisheries for mature cod at Lofoten. It may

therefore be helpful if each country deals as first priority with the data of the area with which she has been mainly concerned in the past ; but, of course, it is to be hoped that by the time of the meeting all the available data will be presented.

G. Rollefsen.