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ANNUAL MEETING - JUNE 1966

Report of Joint ICES/ICNAF Sampling Meeting

Rome, 1-2 October 1965

Chairman: Mr Steinar Olsen  
Rapporteurs: Mr J. A. Gulland  
Mr B. B. Parrish

The meeting took place on Friday and Saturday, 1st and 2nd October, at the Palazzo del Consiglio delle Ricerche, Rome. Representatives from most member countries of ICES and ICNAF participated.

#### Terms of Reference and Subject Matter

With the growth of international reporting of routine, biological stock-record data, especially of length and age, in the ICES and ICNAF areas, the need for uniformity in the kinds of measurements and the forms in which they are published has increased greatly. While both ICES and ICNAF have taken steps in recent years towards the achievement of uniformity within their respective areas, hitherto no serious attempts have been made to achieve uniformity in these procedures for the North Atlantic as a whole. This meeting had this as its principal objective.

In accordance with recommendations adopted at the Annual Meetings of ICES and ICNAF in 1964, the following main topics were dealt with:

- (1) consideration of ways to achieve uniformity in the measurement reporting and publication of routine length and age data, for fish sampled in the North Atlantic.
- (2) the scientific basis of fish sampling, in theory and practice.

The main working material for the meeting were the replies by countries to a questionnaire, issued with the Prospectus for the meeting, concerning the methods used and procedures currently in use in the ICES and ICNAF areas for

- (a) length and age measurement and the reporting of length and age composition data,
- (b) fish sampling, at sea and ashore.

The replies under (a) were discussed in the light of earlier recommendations of both organizations, regarding standardization of these procedures and the proposals of the ICES "Statistical News Letters Working Group" (ICES, C.M. 1964, Doc. No. 30). In addition, written contributions on aspects of item (b) were presented by Mr K. P. Andersen, Mr J. A. Gulland and Mr A. Saville.

#### 1. Length and Age Data

The meeting considered the following specific items under this heading:

- (a) The length dimension to be measured;
- (b) The reading of length measurements;
- (c) The grouping of length data for publication;
- (d) The age reference to be used;
- (e) The form of presentation of length and age data in international "Stock Record" publications.

(a) Length Dimension

The replies from countries showed that while within ICES there is nearly uniformity in the length dimension measured for most species, for which routine length data are reported for publication, there is a lack of uniformity within ICNAF. Except for Tuna species, halibut and the salmonids, scientists in the ICES area measure TOTAL length though the precise method of measuring total length differed slightly, but in the ICNAF area the North American scientists measure FORK length (in accordance with earlier ICNAF recommendations) while the European scientists measure TOTAL length.

While no clear advantage of one of these dimensions could be established, the Meeting agreed that it is of major importance that uniformity in the length dimension measured for each of the major species sampled on both sides of the North Atlantic should, if possible, be achieved. It recognizes, however, that this dimension need not necessarily be the same for all species. It noted that an FAO expert Working Group was currently considering the standardization of routine measurement and reporting procedures for the tuna species throughout the world, and the Meeting agreed that decisions regarding the length dimension to be measured for these species in the ICES and ICNAF areas should await the recommendations of this Working Group.

It was not possible at the meeting to arrive at a final agreement as to the length dimension to measure for the main species in the ICNAF area, but it was noted that the main difference in the present practices were between investigations in the northern Subareas 1 and 2, which are mostly undertaken by European scientists, and those in the Southern subareas 3, 4 and 5, undertaken mostly by North American scientists. The meeting therefore passed the following recommendation:

The meeting noted that there is a lack of uniformity between countries reporting length-composition data to ICES and ICNAF in the length dimension measured. It recognizes the need for such uniformity and accordingly recommends that,

- (i) except for the tunas and salmonids, the length dimension to be measured for all species for which length-composition data are reported to ICES, and to ICNAF from its northern Subarea 1, should be the TOTAL length, defined as the maximum length as measured by bringing the longest lobe of the caudal fin into the mid-line of the fish.
- (ii) Attention be given by ICNAF at its next Annual Meeting to the possibility of adopting TOTAL length for species sampled in its other Subareas 2, 3, 4 and 5.

(b) Method of reading length

Again the replies from countries showed that there is a lack of uniformity in the reading of length. The following two main systems are in use: (a) to the length interval BELOW on the measuring scale (i. e. for a 1-cm interval all lengths between 20.00-20.99 cm are recorded as 20 cm). (b) to the NEAREST length interval (i. e. for a 1-cm interval, lengths between 19.5 and 20.5 are recorded as 20 cm).

The Meeting discussed at length the relative merits of these alternative systems. It agreed that for the commercial sizes of cod and other large species, for which a 1-cm length interval is the smallest practicable one, there are no strong reasons for preferring one system or the other. As a change of system would present few difficulties in the interpretation of past data since the adjustment is a constant difference of 1/2 cm, many of the scientists present expressed their willingness to change, provided that such a change would achieve complete and lasting uniformity.

On the other hand, when measuring smaller fish, e. g. herring and sprat, or the younger individuals of the larger species, for which 1/2 cm or smaller length intervals are often used there are some difficulties in measuring to the NEAREST length interval, especially when subsequent grouping these data over larger intervals is made. For this reason, herring workers in the ICES area have adopted the length interval BELOW as standard. This has created difficulties in some laboratories, where the NEAREST cm is used for demersal fish, so that different measuring boards are needed. Uniformity is therefore as important between species within laboratories as within species for different laboratories.

The Meeting agreed that if uniformity in the reading of length is to be achieved for all species and all countries in the North Atlantic, it will have to be on the basis of measurements to the length interval BELOW, since the countries at present measuring to the NEAREST interval expressed their willingness to consider changing to the interval BELOW, provided that this would achieve final and complete uniformity, the Meeting recommends

that, in order to achieve uniformity in the reading of length for species sampled throughout the North Atlantic, as from 1st January 1967 length measurements for all species should be read to the length interval BELOW and that countries should report to the 1966 Annual Meetings of ICNAF and ICES their agreement to make any changes necessary in their national systems.

(c) Grouping of length data

The Meeting noted that ICNAF has adopted a standard system of grouping intervals for the publication of length-composition data in the Sampling Yearbook, as follows:

|           |       |      |
|-----------|-------|------|
| Cod       | ..... | 3 cm |
| Haddock   | ...   | 2 cm |
| Redfish   | )     |      |
| and       | )     | 1 cm |
| Flounders | )     |      |

and that all countries submit data to ICNAF according to this scheme.

It also noted that, while as yet there is no standard system within ICES, the Statistical News Letters Working Group had made proposals for standard grouping intervals for the main ICES species, which were due to be considered at the forthcoming ICES meeting. For those species which are sampled on both sides of the Atlantic, the grouping intervals proposed by this Working Group were the same as the ICNAF ones.

The Meeting agreed that the appropriate grouping interval for a species depended on the purposes for which the length data are used and on the acceptable limits of accuracy of estimates derived from them. It was proposed that, in using length data with age/length keys for obtaining age compositions an appropriate theoretical basis for the choice of the grouping interval was that it should not be larger than half the standard deviation of the length distribution of an age-group. This implies that the acceptable upper limit of the size of the group will vary between stocks of the same species as well as between species.

The Meeting recognized that data were not available at the meeting from which to judge the appropriateness of the grouping intervals proposed by the Newsletters Working Group for species in the ICES area, especially for cod in the northern areas (e. g. Iceland, Bear Island). Therefore, since the adoption of a narrower grouping interval than necessary increases substantially the workload within laboratories and the cost of publication, the Meeting recommends

that these proposals be considered further by the appropriate Committees of ICES at the forthcoming meeting.

(d) Age reference

The Meeting agreed that uniformity in the reporting of age data to ICNAF and ICES was of major importance for allowing the pooling of age/length key data etc. It noted that the age reference used in reporting these data differed between countries and species, and it recommends

that, in order to avoid ambiguity and obtain the maximum uniformity in the reporting of age data (a) 1st January should be taken as the birthday date for purposes of reading age for all species, sampled in the ICES and ICNAF areas. (b) That, in reporting age data for publication the year-class as well as the age of the fish should be given.

(e) Reporting of length and age data

The Meeting noted that the "Newsletters Working Group" of ICES had made specific proposals regarding the form in which the length- and age-composition data should be reported and published and had specified a number of additional items of information which countries should supply along with their tabulations. It approved these proposals and stressed the importance of the additional items of information, without which it is not possible to raise a country's length and age data to the total landings. The Meeting noted that these items of information are often lacking in the ICNAF Sampling Yearbook and it recommends

that both ICES and ICNAF ask countries to supply these items of information when submitting their length- and age-composition data for publication.

2. Sampling Methods

The Meeting discussed at length the scientific basis of fish sampling and the factors governing sampling efficiency in theory and practice. It recognized that it is not possible to adopt a standard sampling system for all fisheries in the ICES and ICNAF areas since they are dependent on the practical circumstances existing in the different countries and areas. It was agreed, however, that in all cases the main objective should be to minimize or eliminate bias in the sampling, the possible sources of which must be investigated in each fishery. The Meeting agreed that the basic elements of efficient sampling, which should be followed in the design of individual sampling programmes were contained in the FAO manual of sampling methods by J. A. Gulland.

The Meeting was informed of major difficulties which are now developing in sampling fish aboard factory trawlers, on which the catches are handled mechanically by size-groups. It was agreed that special attention should be given to these problems by scientists in both ICES and ICNAF. In particular, attention should be paid to the development of mechanical methods of length measurement and counting so that the sampling can be undertaken during the passage of fish through the production plants.

At the conclusion of the meeting the view was expressed that much of the lack of uniformity in fish measurement was due to the lack of clear instructions as to the basic scientific principles and practical elements of the problem. The Meeting noted that while the FAO Sampling Manual fulfilled this need for fish sampling, there is the need for a basic instructional guide on methods of fish measurement.

It was also agreed that every effort should be made to encourage the technical developments necessary to enable research vessels to make rapid surveys for the abundance and composition of fish stocks, in the same way as equipment has been developed for rapid hydrographic survey.

Agenda

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1. Opening of the Meeting
2. Agenda
3. Methods of Measurement
  - a) dimension to be measured (total, fork, standard length, etc.)
  - b) system of measuring (nearest cm, cm below, etc.)
4. Presentation of data for Routine Publications:
  - a) length data (grouping)
  - b) age data
5. Some basic principles of sampling
6. Sampling the catch
7. Sampling the market
8. Summing up and recommendations
9. Adjournment

List of Contributions to Joint ICES/ICNAF Sampling Meeting

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- Contrib. No. 1 Extract from Report of Statistical Newsletters Working Group (ICES, C. M. 1964 No. 30).
- Contrib. No. 2 Some Aspects of Sampling. by J. A. Gulland, Lowestoft
- Contrib. No. 3 A Comparison of Direct and Indirect Age Sampling in a Herring Fishery. by A. Saville, Aberdeen
- Contrib. No. 4 Random Sampling and the Use of an Age/Length Key. by Knud P. Andersen
- Contrib. No. 5 Summary of Measurement Procedures and Sampling Methods used in Reporting Stock-Record Data (Length and Age) to ICES and ICNAF (with Annexes I-XVIII, Replies to the Questionnaire about Present Practices in Length and Age Sampling)

Note: Distribution of the contributions has been limited to the following laboratory representatives. A few copies of each contribution are still available on request from the ICNAF Secretariat.

- Canada - W. Templeman, J. L. Hart, L. M. Dickie, A. Marcotte, K. Ketchen
- Denmark - P. Hansen
- France - R. Letaconnoux
- Germany, Fed. Rep. - A. Meyer
- Iceland - J. Jonsson
- Italy - G. Cannone
- Norway - E. Bratberg
- Poland - F. Chrzan
- Portugal - R. Monteiro
- Spain - O. Rodriguez Martin
- USSR - A. S. Bogdanov, S. A. Studenetsky
- UK - H. A. Cole, C. E. Lucas
- USA - H. W. Graham, B. E. Skud