# International Commission for the Northwest Atlantic Fisheries

## ANNUAL MEETING – JUNE 1979

### Outline of ICNAF Sampling Program up to 1978

by

Assistant Executive Secretary

At its 1978 Annual Meeting, STACRES was informed of the urgent need to modify its requirements for the reporting of sampling data in the light of the more detailed requirements of some of the coastal states for sampling within their 200-mile fisheries zones. Consequently, an *ad hoc* working group was established to review the current practice and propose new standards for the reporting of sampling data that would be applicable to the Northwest Atlantic as a whole (*Redbook* 1978, pages 41 and 88). A review of progress on this matter is given in Sum. Doc. 79/VI/23. Meanwhile, the Biological Surveys Subcommittee at its meeting in May 1978 requested the ICNAF Secretariat to "compile an updated list of length measurement conventions and clarify sampling standards currently used in the reporting of sampling data" (*Redbook* 1978, page 80).

Each issue of Sampling Yearbook, starting with Vol. 19 (for 1974), contained an outline of the ICNAF Sampling Program, which has been updated as required, the most recent being that given in Vol. 21 (for 1976) which was issued in December 1978. This outline contains information on sampling requirements relevant to the reporting of length and age data, including the length conventions and sexing criteria. It should be noted that, although some research vessel sampling data are reported annually, the sampling requirements were developed for commercial fisheries. The outline as presented in *Sampling Yearbook* Vol. 21 is as follows:

# ICNAF Sampling Program

## 1. Introduction

In "A Fishery Research Program for the Northwest Atlantic", adopted by the Commission at its 1953 Annual Meeting (*ICNAF Annu. Proc.*, Vol. 3, page 23), the need for catch sampling is emphasized as follows: "In order to recognize the effect of fishing, it is necessary to record the lengths of the fish in adequate samples of catches, showing fish discarded and fish retained. This is considered essential for all the fisheries for the important species by all the participating countries throughout the Convention Area. The total range of fish caught can be sampled only at sea by specially trained observers. The sea sampling of the sizes retained should be supplemented by sampling of landings ashore."

At its 1956 Annual Meeting, the Commission approved the following recommendation of the Standing Committee on Research and Statistics (STACRES): "For each species sampled, each country should report to the Secretariat the sizes, ages, weights and sexes of the fish sampled by place and time of capture. The Commission should publish these statistics" (*ICNAF Annu. Proc.*, Vol. 6, page 11). The first issue of Sampling Yearbook was published in 1958, containing sampling data for the years 1955 and 1956. This was the beginning of the ICNAF sampling program.

During the years since the inception of the program, there have been many recommendations for improvements in relation to both the quantity and quality of the required data, and the need for full participation by member countries. In Volume 19 of ICNAF Sampling Yearbook, a first attempt was made to outline the present sampling requirements. The outline, along with proposed changes, was reviewed and endorsed by the Sampling and Statistics Subcommittee of STACRES in 1976 (*ICNAF Redbook 1976*, page 130).

## 2. Minimum Sampling Requirements

At its 1974 Annual Meeting, STACRES reviewed several aspects of the sampling program. In reiterating the necessity for all member countries to adequately sample their commercial fisheries for length and age composition of catches, the minimum sampling requirement was revised to read as follows:

"That the ICNAF sampling requirement should be specified at one sample per 1,000 tons of fish caught for each division, quarter of year, and gear. As an approximate guideline, such samples should consist of 200 fish from the entire length range for length composition and one fish per centimeter length group for age composition."

Sampling data must be "in sufficient quantity and detail to enable the calculation of the length and age composition of the commercial catches by stock area on a monthly basis" (*ICNAF Redbook 1973*, page 54). However, it is emphasized that the sampling data must be reported by division (or subdivision, where applicable) and not by stock area, in order to achieve uniformity in reporting and subsequent data-processing. Furthermore, in cases where the data for a species are required to be reported by sex, it is necessary that twice the number of specimens be collected for length and ageing in order to produce usable age-length keys.

The reported length frequency data should reflect the length composition of the catches made in each division (or subdivision) and month. Sampling should be more frequent when catches are high, and appropriate weighting should be applied to the individual samples to ensure that the monthly length frequencies represent the monthly catches.

## 3. Source of Sampling Data

In the past, sampling data have usually been classified as research, exploratory or commercial, depending on the type of fishing operations being undertaken at the time when the samples were collected. There has often been some confusion over the use of the terms, particularly in regard to the applicability of the various types of sampling data for assessment work, and some clarification is necessary.

a) Research. These samples are taken on true research vessels, operating independently of the commercial fishing fleet and using true research vessel fishing gear (e.g. otter trawl, with codend meshes considerably different from those in commercial trawls, or with codends lined or covered with small-meshed material irrespective of the mesh size of the codend). Because these

samples are not representative of commercial operations, they cannot be applied to the nominal catches, but are often of value for predicting future recruitment. Research samples are usually the outcome of survey programs to generate abundance and recruitment indices.

b) <u>Commercial</u>. Samples taken from the catches of exploratory and/or commercial fishing vessels using gear normally used for commercial fishing (in accordance with ICNAF trawl regulations, where applicable) should be classified as commercial samples. Such sampling implies that the escapement from the codend is not restricted by codend liners or topside covers or chafers and that the samples are representative of the commercial catches. These samples represent the commercial removals from the stocks and are essential for stock assessments.

In cases where samples are taken from the catches of research and/or exploratory vessels using commercial-type gears (e.g. trawls in which mesh selection is in accordance with the ICNAF mesh regulations), and where the fishing was carried out in association with commercial fishing operations, the data should be reported as "research vessel" data, with a note on the sampling form indicating the applicability of the data to commercial fishing (*ICNAF Redbook* 1977, page 67).

4. <u>Sampling of Catches *versus* Landings</u>

Commercial samples may be taken at sea from catches before any discarding has occurred (the term "discarding", as used here, implies fish thrown overboard and not included in the nominal catches, as opposed to fish used for fishmeal and included in the nominal catch), from catches after discarding, from landed catches at the dock or processing plant prior to discarding, or from landed catches after discarding. Thus commercial samples should be designated by type as follows:

a) <u>Catch</u>. The samples should be designated as catch samples, if it is fairly certain or definitely known that no discarding has occurred prior to sampling, whether the samples are taken from the catches at sea or taken from the landed catch at the dock or in the processing plant.

b) <u>Landing</u>. The samples should be designated as landing samples, whether they are taken at sea or in port, if it is known that discarding of small fish has occurred prior to sampling.

c) <u>Discards</u>. Every effort should be made to obtain representative samples of discarded fish, particularly in cases where the samples reported normally reflect the landings.

In some countries the only opportunity for sampling is of landings of fish that have been sorted into market categories (i.e. large, medium, and small). Samples taken in this way must be properly weighted (by the catch or landing for each category) and combined into a representative sample of the catch (or landings) prior to submission to ICNAF.

5. <u>Length Sampling Data</u>

Length measurements should always be taken of fish which are randomly sampled from the actual catches (or landings) and which are in the natural condition (round fresh fish). If the fish are measured in any other condition (e.g. gutted or dressed), necessitating the use of conversion factors, the appropriate conversion of the length measurements to those representative of "whole fresh" fish should be made before the length frequencies are reported to ICNAF.

At the 1975 Annual Meeting, there was some discussion on the proper length to be measured for the various species, i.e. fork length and total length (*ICNAF Redbook* 1975, page 79). In the light of evidence brought forward that the method of measuring differs among countries for the different species, it was strongly emphasized that information on measuring methods be reported by countries in their annual sampling notes. In order to ensure that the measuring method is recorded for all samples, it was recommended that provision be made on the standard sampling forms for countries to report the type of length measurement appropriate to the sampling data reported on the form. The revised forms (for soliciting 1975 and subsequent sampling data) provide for the recording of the various types of length measurements as follows:

<u>Fork length</u> - from the tip of the snout to the apex of the V forming the fork of the tail, for species with forked tails.

<u>Total length</u> - from the tip of the snout to the tip of the longest lobe of the tail when the lobe is extended posteriorly in line with the body. This is sometimes referred to as greatest total length. For fishes with non-forked tails, only total length is appropriate.

<u>Other (to be specified)</u> - for example, mantle length for squids, upper valve greatest diameter for scallops, carapace length for shrimps, etc.

In addition to indicating the type of length measurement (as noted above), it is very important that countries provide the method of recording the measurements as follows:

Nearest cm (rounded) - measurements are recorded to the nearest centimeter (i.e. fish in the length range 29.5-30.4 cm are actually recorded as 30 cm).

Cm below (truncated) - measurements are recorded to the centimeter below (i.e. fish in the length range 30.0-30.9 cm are recorded as 30 cm).

Other (to be specified) - for example, capelin are to be measured in half-cm units, and should be recorded to the nearest half-cm or half-cm below.

6.    Age Sampling Data

In order to assess the status of fish stocks by means of analytical models such as "Virtual Popula-tion" or "Cohort" analyses, realistic estimates of the age compositions of the catches are essential. The usual procedure is to collect substantial length composition data as being representative of the commercial catches of a species in a particular area over a given period of time.  These data are supplemented by additional material for ageing, from which age-length keys are constructed.  The representative length compositions are converted to age compositions by the application of the age-length keys to the length frequencies.  These age composition estimates are then weighted by the catches to estimate the removals at age from the stock.

While the samples for length composition represent the basic sampling units, and these must be com-posed of fish randomly selected from the catches (or landings), samples taken to provide material for ageing may consist of fish which are randomly selected from the catches or which are selected by a stratified procedure:

a)    Random sampling for age means that the sample is a random subsample of the length composition or it may be a separate small random sample of the catch taken specifically for ageing, with no attempt made to select fish by length groups.

b)    Supplemented random sampling for age implies that the basic age sample was taken as in (a), but some effort is made to supplement the basic sample with fish in the upper and lower parts of the length frequency distribution in order to broaden the length spectrum of the age-length key.

c)    Stratified sampling for age implies that a certain number of fish are selected from each length group represented in the catch length composition, and that the fish are selected at random within each length group.

Random age samples are the least effective of the three types, in that the number of specimens in each sample is usually only a fraction of the number of fish in the length sample, and consequently the entire range of the length groups represented by the catch length composition will rarely be covered.  Thus ages cannot be properly assigned to those length groups in the length frequency where there are no ages in the corresponding length groups of the age-length key.

In contrast, stratified age samples are the most effective in that the length groups in the length frequency sample are usually also represented in the age-length key.  This type of sample is also the most efficient in that the least number of fish are required to be taken for age determination.

7.    Length Conversions

If the length measurements of fish taken for ageing are collected from specimens in the "round fresh" condition, the length groups in the length composition sample and those in the age-length key are directly comparable.  If, on the other hand, the length composition sample consists of fish measured in the "round fresh" condition and the length measurements of the fish in the age sample are taken after the fish have been in frozen storage for a period of time, and, assuming that some shrinkage has occurred prior to measuring the frozen specimens, then the length intervals of the actual length composition data and of the age-length key are not directly comparable.  The application of such an age-length key to the length composition data results in age compositions that are biased toward the higher age-groups.  A very small shrinkage factor (say 3%) can result in serious bias in the calcu-lated age compositions.  It is therefore extremely important that the length measurements of fish from frozen age samples be adjusted by appropriate conversion factors to make them representative of "round fresh" fish, if the actual length samples are measured when the fish are "round fresh".

8.    Weight Conversions

As in catch statistics, the weights reported in sampling data are required to be round fresh weights. Any correction factors that may be required to convert gutted or otherwise dressed fish (including freezing) may be found in "Conversion Factors:  North Atlantic Species, 1970. *FAO Bull. Fish. Stat.* No. 25".

The proper application of length frequency data to obtain the length composition of the catch requires that the average weight of fish in the sample be given. This value is readily obtained if the sample weight is recorded at the time the sample is collected. If length sampling is carried out at sea where weighing may be difficult or impossible, the average weight of the reported length frequency should be calculated by applying an appropriate length-weight relationship.

Calculating the mean weight from length-weight regressions must be done with consideration for the possible bias in incorrect appplication. It is not correct to obtain the mean weight by applying the mean length of fish in the sample to a length-weight regression based on measurements of individual fish. The result will be an underestimate of the mean weight and a consequent overestimate of the number of fish in the catch. The non-linearity of the length-weight regression must be taken into account and this is done by applying a vector of weights-at-length to the length frequency.

9.   Sampling by Sex

Differences in growth rate and maximum length between the male and female of many species (e.g. flat-fishes, hakes, redfish, capelin) require that the sex of the sampled fish be determined. Failure to discriminate sex in these species results in unrealistic age distributions. There are two ways to proceed, the first of which is recommended when feasible:

a)   Each sex should be treated as an independent sampling unit; that is, length frequency data and ageing data are collected for male and female as if they were separate species. However, the sex ratio must be reflected in the length frequency total for each sex, so that the "per mille" frequency of male and female combined total 1000. The mean length and the mean weight should always be given for each sex and not just for sexes combined.

b)   In cases where sex is difficult to recognize while collecting length frequency data, the alter-native is to determine the sex when the individual fish constituting the age samples are being examined. In this case, it is important that the selection of fish at each length interval be random with respect to sex, in order to ensure that the sex ratio of fish at each length interval in the sample reflects the true sex ratio of the corresponding length in the catch. The resulting age-length keys (male and female separate) should upon application to the length frequency (male and female combined) result in age frequencies of males and females that are representative of the age compositions of the catches by sex.

10.   Length Intervals and Sexing Criteria

At the 1974 Annual Meeting, the Statistics and Sampling Subcommittee reviewed the length groups to be used for the reporting of length frequencies and age-length keys, for most of the species sampled in the ICNAF Area, and specified the particular species for which it is essential that the data be provided by sex (males and females separately). The following list also includes changes agreed to at the 1975 Annual Meeting:

| Species | Length Group |
|---------|--------------|
| Atlantic cod (*Gadus morhua*) | 3 cm |
| Pollock (=Saithe) (*Pollachius virens*) | 3 cm |
| Cusk (*Brosme brosme*) | 3 cm |
| White hake (*Urophycis tenuis*) | 3 cm |
| Wolffishes (*Anarhichas* sp.) | 3 cm |
| Roundnose grenadier (*Macrourus rupestris*) | 3 cm (by sex) |
| Haddock (*Melanogrammus aeglefinus*) | 2 cm |
| Greenland cod (*Gadus ogac*) | 2 cm |
| Red hake (*Urophycis chuss*) | 2 cm |
| American plaice (*Hippoglossoides platessoides*) | 2 cm (by sex) |
| Witch flounder (*Glyptocephalus cynoglossus*) | 2 cm (by sex) |
| Yellowtail flounder (SA 3-4) (*Limanda ferruginea*) | 2 cm (by sex) |
| Greenland halibut (*Reinhardtius hippoglossoides*) | 2 cm (by sex) |
| Winter flounder (*Pseudopleuronectes americanus*) | 2 cm (by sex) |
| Summer flounder (*Paralichthys dentatus*) | 2 cm (by sex) |
| Redfish (*Sebastes* sp.) | 1 cm (by sex) |
| Silver hake (*Merluccius bilinearis*)[1] | 1 cm (by sex) |
| Yellowtail flounder (SA 5-6) (*Limanda ferruginea*) | 1 cm (by sex) |
| Windowpane flounder (*Scophthalmus Aquosus*) | 1 cm (by sex) |
| Atlantic herring (*Clupea harengus*) | 1 cm |
| Atlantic mackerel (*Scomber scombrus*)[2] | 1 cm |
| Atlantic butterfish (*Peprilus triacanthus*) | 1 cm |

| Species | Length Group |
|---|---|
| Alewife (*Alosa pseudoharengus*) ..................................................... | 1 cm |
| Atlantic argentine (*Argentina silus*) .......................................... | 1 cm |
| Squids (*Illex* and *Loligo*) ......................................................... | 1 cm |
| Capelin (*Mallotus villosus*) ......................................................... | ½ cm (by sex) |
| Sea scallops (*Placopecten magellanicus*) ........................................ | ½ cm |
| Northern deepwater prawn (*Pandalus borealis*) ................................... | 1 mm (by sex) |

Other species not listed above should initially be reported by 1-cm length groups.

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[1] At the 1975 Annual Meeting, it was recommended that <u>silver hake</u> be reported by 1-cm length groups and also by sex, instead of by 2-cm length groups as in the past. Length frequencies not reported by sex must be supported by age-length keys for males and females separately.

[2] At the 1975 Annual Meeting, it was recommended that length frequencies and age-length keys reported for <u>mackerel</u> be based on measuring the fork length to the centimeter below.

11. <u>ICNAF Sampling Forms</u> (Rev. 01/77)

The completeness of the ICNAF data base, with regard to sampling data for the major commercial fisheries in the Northwest Atlantic, depends entirely on the extent to which member countries of ICNAF sample the catches of their fishing fleets and report these statistics to the Secretariat. As the ICNAF Sampling Program has gradually evolved over the years since its introduction in the early 1950's, various types of forms have been adopted for use by member countries in reporting their sampling data to the Secretariat. More recently, with the need for standardization to facilitate computer-processing of the data, the basic information required has been consolidated into two forms, referred to as ICNAF Sampling Form 1 and Sampling Form 2.

a) <u>Sampling Form 1</u> is designed for use in reporting sampling data for species for which both length and age data are available. For each quarter of the year and for each gear, division (or subdivision) and species, a separate sheet must be used. Three columns are provided for recording the "per mille" length frequencies by month within a quarter; it is very important that the applicable length group used be indicated. The main body of the sheet is for the age-length key for the quarter, expressed as the actual numbers of fish sampled for age (not on a "per mille" basis). The bottom section of the form is for providing the "per mille" age composition in each of the three months. The box in the lower right part of the form (number of age samples making up the age-length key) must be completed.

b) <u>Sampling Form 2</u> is designed for use in reporting length compositions when no age data are available. The layout is similar to Sampling Form 1 except that more columns are provided for recording length frequencies.

For species which are required to be reported by sex, if both length and age data are available for male and female separately, use separate sheets of Sampling Form 1 for reporting the data for each sex. However, the sex ratio must be reflected in the length frequency total for each sex, so that the "per mille" frequency of male and female combined total 1000. For example, if a length frequency consisted of 200 fish, of which 90 were male and 110 were female, then the frequencies recorded on the sampling sheets should total 450 for male and 550 for female, after applying the appropriate conversion factor.

If age-length keys are not normally available for certain species (e.g. squids), the monthly length frequencies (per mille) may be reported on Sampling Form 2. In the case of species required to be reported by sex, the frequencies for male and female should be recorded in adjacent columns of the same sheet and reflect the sex ratio as indicated in the preceding paragraph.

The details required below each length frequency on both Sampling Forms 1 and 2 must be as complete as possible. The "number of samples" (both length and age) and the "number of fish measured" must always be given, as these are used to assess the adequacy of sampling in relation to the minimum sampling requirements. While the mean length of fish in each length frequency can readily be calculated, the "mean weight of fish" in the length frequency is particularly important, as this is used as a weighting factor to estimate the length and age composition of the catch. This weight must, of course, be expressed as "round fresh" weight, as opposed to gutted or otherwise dressed weights. Information on "gear size" and "depth range" is often very useful in evaluating how applicable the sampling data reported are to commercial fishing operations.

INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

AGE/LENGTH TABLE FOR SPECIES REPORTED IN 1-CM, 2-CM OR 3-CM LENGTH GROUPS

| Year: | Country: | | Species: | |
|---|---|---|---|---|
| Quarter: | Division (or Subdivision): | Gear: | | Sex (where applicable): |
| Research, Exploratory or Commercial Fishing: | | Catches or Landings: | | Structure used for Ageing: |
| Check method of measuring fish (✓) | Fork length ☐ Total length ☐ | Mantle ☐ Other ____ | To nearest cm ☐ To cm below. ☐ | Reported by: |

| Check length group used | | | LENGTH COMPOSITION OF CATCH PER MILLE Months in Quarter | | | | AGE-LENGTH KEY FOR QUARTER (Number sampled by age-group and length) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1cm | 2cm | 3cm | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 18- | 18- | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 20- | 21- | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 22- | 24- | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 24- | 27- | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 26- | 30- | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 28- | 33- | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 30- | 36- | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 32- | 39- | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 34- | 42- | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 36- | 45- | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 38- | 48- | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 40- | 51- | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 42- | 54- | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 44- | 57- | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 46- | 60- | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 48- | 63- | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 50- | 66- | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 52- | 69- | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 54- | 72- | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 56- | 75- | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 58- | 78- | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 60- | 81- | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 62- | 84- | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 64- | 87- | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 66- | 90- | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 68- | 93- | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 70- | 96- | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 72- | 99- | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 74- | 102- | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 76- | 105- | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 78- | 108- | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 80- | 111- | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 82- | 114- | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 84- | 117- | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 86- | 120- | | | | | | | | | | | | | | | | | | | | | | | |
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| TOTALS | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | |
|---|---|---|---|
| | Number of length samples | | Number of age samples in quarter |
| | Number of fish measured in each month | | |
| | Mean length of fish in each month (mm) | | |
| | Mean weight of fish in each month (grams) | | |
| | Range of depths in each month (meters) | | |
| | Mesh or hook size (mm) | | |

AGE COMPOSITION (PER MILLE)

| Month \ Age | | | | | | | | | | | | | | | | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | |
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Sampling Form 1 (Rev. 01/77)

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INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

LENGTH FREQUENCIES FOR SPECIES REPORTED IN 1-CM, 2-CM OR 3-CM LENGTH GROUPS

| Year: | Country: | | Species: | |
|---|---|---|---|---|
| Quarter: | Division (or Subdivision): | Gear: | | Sex (where applicable): |
| Research, Exploratory or Commercial Fishing: | | Catches or Landings: | | |
| Check method of measuring fish (✓) | Fork length ☐    Mantle ☐ <br> Total length ☐    Other ____ | | To nearest cm ☐ <br> To cm below ☐ | Reported by: |

| Check length group used | | | LENGTH COMPOSITION (PER MILLE) BY MONTH (and sex, where applicable) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1cm | 2cm | 3cm | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 1 | 18- | 18- | | | | | | | | | | | | |
| 2 | 20- | 21- | | | | | | | | | | | | |
| 3 | 22- | 24- | | | | | | | | | | | | |
| 4 | 24- | 27- | | | | | | | | | | | | |
| 5 | 26- | 30- | | | | | | | | | | | | |
| 6 | 28- | 33- | | | | | | | | | | | | |
| 7 | 30- | 36- | | | | | | | | | | | | |
| 8 | 32- | 39- | | | | | | | | | | | | |
| 9 | 34- | 42- | | | | | | | | | | | | |
| 0 | 36- | 45- | | | | | | | | | | | | |
| 1 | 38- | 48- | | | | | | | | | | | | |
| 2 | 40- | 51- | | | | | | | | | | | | |
| 3 | 42- | 54- | | | | | | | | | | | | |
| 4 | 44- | 57- | | | | | | | | | | | | |
| 5 | 46- | 60- | | | | | | | | | | | | |
| 6 | 48- | 63- | | | | | | | | | | | | |
| 7 | 50- | 66- | | | | | | | | | | | | |
| 8 | 52- | 69- | | | | | | | | | | | | |
| 9 | 54- | 72- | | | | | | | | | | | | |
| 0 | 56- | 75- | | | | | | | | | | | | |
| 1 | 58- | 78- | | | | | | | | | | | | |
| 2 | 60- | 81- | | | | | | | | | | | | |
| 3 | 62- | 84- | | | | | | | | | | | | |
| 4 | 64- | 87- | | | | | | | | | | | | |
| 5 | 66- | 90- | | | | | | | | | | | | |
| 6 | 68- | 93- | | | | | | | | | | | | |
| 7 | 70- | 96- | | | | | | | | | | | | |
| 8 | 72- | 99- | | | | | | | | | | | | |
| 9 | 74- | 102- | | | | | | | | | | | | |
| 0 | 76- | 105- | | | | | | | | | | | | |
| 1 | 78- | 108- | | | | | | | | | | | | |
| 2 | 80- | 111- | | | | | | | | | | | | |
| 3 | 82- | 114- | | | | | | | | | | | | |
| 4 | 84- | 117- | | | | | | | | | | | | |
| 5 | 85- | 120- | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Total | | | | | | | | | | | | | | |
| No. of samples | | | | | | | | | | | | | | |
| No. fish meas. | | | | | | | | | | | | | | |
| Mean length (mm) | | | | | | | | | | | | | | |
| Mean weight (g) | | | | | | | | | | | | | | |
| Depth range (m) | | | | | | | | | | | | | | |
| Mesh/hook (mm) | | | | | | | | | | | | | | |

NOTE: If reporting frequencies by sex, use groups of 3 columns above headed 'Male', 'Females', and 'Total'.

Sampling Form 2 (Rev. 01/77)