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Revised Outline of NAFO Sampling Program

by

Assistant Executive Secretary

Following the adoption at the 1979 Meeting of the Scientific Council, of new standardized reporting procedures for commercial sampling data, based on the recommendation of STACRES at the February 1979 and June 1979 Meetings (ICNAF Redbook 1979, pages 9, 95), the Secretariat was requested to revise the outline of the ICNAF Sampling Program to reflect the changes relevant to the implementation in 1979 of more detailed sampling requirements as indicated by the introduction of the 2 new sampling forms (CFS-1 and CFS-2), and to incorporate the special requirements for squid sampling as adopted by STACRES at its February 1978 Meeting. It was also suggested that the updated version of the sampling program (Appendix I) be distributed to scientists for comment with a view to further expansion and improvement.

Revised NAFO 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).

At the 1978 Annual Meeting of ICNAF, it was noted that the coastal states' requirements for collecting and reporting sampling data would significantly modify the standards used up to 1977 and that these modifications would have implications on the work of the Secretariat as well as on member countries. Consequently, the Working Group on Standardization of Reporting Procedures for Sampling Data met in November 1978 and its report was adopted at the 1979 Annual Meeting (*ICNAF Redbook* 1979, pages 21, 95). The basic conclusions were the desirability of having a standardized procedure for the reporting of sampling data throughout the whole of the NAFO Area and the need for commercial data to be reported in considerably more detail than in the past. Consequently, forms were designed to allow for the reporting of individual length samples of commercial catches and the corresponding age-length keys effective 1 January 1979.

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."

Although the guideline that such samples should consist of about 200 fish from the entire length range of the length composition and one fish per cm length group for age composition remains unchanged, the major changes in the sampling requirements are that length samples of individual trawl catches should be taken more frequently during the fishing seasons and reported as individual samples by actual position and date rather than being grouped by division and month as in the past. In view of the practical difficulties of obtaining suitable age-length keys corresponding to the individual length samples, the data from samples taken for ageing should not be combined for periods exceeding one calendar month or for areas greater than one NAFO division (or subdivision, where applicable) (*ICNAF Redbook* 1979, page 9).

In the case of port sampling, where the samples are derived from the accumulated catch of several days fishing activity, the numbers of fish measured and aged should be substantially increased, and the individual length samples should be reported on a trip basis rather than grouped by month as in the past.

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) Commercial. 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. Sampling of Catches versus Landings

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) Catch. 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) Landing. 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) Discards. 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. Length Sampling Data

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:

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

Total length - 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.

Other (to be specified) - 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 Population" 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 composed 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 calculated 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 application. 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. flatfishes, 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 alternative 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. Special Sampling Requirements for Squid

The standards and procedures, outlined in ICNAF Res. Doc. 78/II/5 and subsequently published in ICNAF Sel. Papers No. 5 (page 37), were adopted at the Special Meeting in February 1978 (ICNAF Redbook 1978, page 33) as a general guide for the biological sampling of *Illex*, involving the collection of data on mantle length, weight, sex, maturity stages and stomach fullness. In particular it was recommended that the length compositions for *Illex* be reported by 1/2-cm intervals for males and females separately.

11. 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 (<i>Gadus morhua</i>)	3 cm
Pollock (=Saithe) (<i>Pollachius virens</i>)	3 cm
Cusk (<i>Brosme brosme</i>)	3 cm
White hake (<i>Urophycis tenuis</i>)	3 cm
Wolffishes (<i>Anarhichas</i> sp.)	3 cm
Roundnose grenadier (<i>Macrourus rupestris</i>)	3 cm (by sex)

Species	Length Group
Haddock (<i>Melanogrammus aeglefinus</i>)	2 cm
Greenland cod (<i>Gadus ogac</i>)	2 cm
Red hake (<i>Urophycis chuss</i>)	2 cm
American plaice (<i>Hippoglossoides platessoides</i>)	2 cm (by sex)
Witch flounder (<i>Glyptocephalus cynoglossus</i>)	2 cm (by sex)
Yellowtail flounder (SA 3-4) (<i>Limanda ferruginea</i>)	2 cm (by sex)
Greenland halibut (<i>Reinhardtius hippoglossoides</i>)	2 cm (by sex)
Winter flounder (<i>Pseudopleuronectes americanus</i>)	2 cm (by sex)
Summer flounder (<i>Paralichthys dentatus</i>)	2 cm (by sex)
Redfish (<i>Sebastes</i> sp.)	1 cm (by sex)
Silver hake (<i>Merluccius bilinearis</i>) ¹	1 cm (by sex)
Yellowtail flounder (SA 5-6) (<i>Limanda ferruginea</i>)	1 cm (by sex)
Windowpane flounder (<i>Scophthalmus Aquosus</i>)	1 cm (by sex)
Atlantic herring (<i>Clupea harengus</i>)	1 cm
Atlantic mackerel (<i>Scomber scombrus</i>) ²	1 cm
Atlantic butterflyfish (<i>Peprilus triacanthus</i>)	1 cm
Alewife (<i>Alosa pseudoharengus</i>)	1 cm
Atlantic argentine (<i>Argentina silus</i>)	1 cm
Squids (<i>Illex</i> and <i>Loligo</i>)	½ cm (by sex)
Capelin (<i>Mallotus villosus</i>)	½ cm (by sex)
Sea scallops (<i>Placopecten magellanicus</i>)	½ cm
Northern deepwater prawn (<i>Pandalus borealis</i>)	1 mm (by sex)

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

- 1 At the 1975 Annual Meeting, it was recommended that silver hake 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 mackerel be based on measuring the fork length to the centimeter below.

12. NAFO Sampling Forms (01/80)

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 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 and the requirement for reporting commercial data in more detail than previously, the basic information required has been consolidated into 2 forms, referred to as CFS-1 and CFS-2.

- a) Form CFS-1 is designed for use in the reporting of length frequencies for (i) several species from the same haul; or (ii) the same species from different hauls, or (iii) for species sampled at the port of landing. Each length sample should correspond to the actual number of fish measured and all of the relevant information must be recorded to facilitate data-processing. In the case of (iii) above, it will not be possible to provide all of the detailed information required for sampling at sea. Notes for completion are given on the reverse side of the form.
- b) Form CFS-2 is designed for the reporting of individual age-length samples but may also be used for the reporting of age-length keys based on port sampling or grouped sea samples. With reference to the grouping of samples, the practical difficulties of obtaining suitable age-length keys corresponding to individual length samples was recognized, but such age samples should not be grouped for periods exceeding one calendar month or for areas greater than one NAFO division (or subdivision, where applicable). Notes for completion are given on the reverse side of this form.

NORTHWEST ATLANTIC FISHERIES ORGANIZATION
COMMERCIAL FISHERY LENGTH SAMPLES, 19__

Country	Vessel name	Side no.	National reg. no.
Gear	Mesh size (mm)	Port or sea	Reported by

Date (month/day)															
Starting time of set (GMT)															
NAFO Division															
Start of set position	Lat. Long.														
Fishing Depth (m)															
SPECIES SAMPLED															
Catch or Landing															
Method of measuring															
Recorded meas.															
Length interval															
1cm	2cm	3cm	5mm	M	F	M	F	M	F	M	F	M	F	M	F
0	16-	15-													
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-													
Number measured															
Sample weight (kg)															
Catch weight (kg)															
No. for ageing															

NOTES FOR COMPLETION OF FORM CFS-1

This form is designed to facilitate the reporting of length frequencies for (a) several species from the same haul, or (b) the same species from different hauls, or (c) for species sampled at the port of landing. In the last case, it will not be possible to provide all of the detailed information required for sampling at sea. However, in order to facilitate data-processing, it is essential that all of the information required for each sample be entered in the appropriate spaces on the form.

1. Year. Record the last two digits of the calendar year in the space provided at the top of the form.
2. Country, Vessel name, Side number, and National registration number should always be recorded to ensure proper identification of the samples.
3. Gear. Record the appropriate abbreviation for the gear type used, based on the NAFO Gear Classification for reporting sampling data. In the case of otter trawls used in certain fisheries (e.g. squid), special modifications to the gear (e.g. off-bottom chain, off-bottom bobbin, etc.) should be indicated in a note at the bottom of the form. The primary abbreviations are as follows:

OTB - Bottom otter trawl (side and stern)	LL - Longlines (set)
OTM - Midwater otter trawl (side and stern)	LHP - Handlines and pole-lines
PTB - Bottom pair trawl (2 boats)	FPN - Uncovered pound nets
PTM - Midwater pair trawl (2 boats)	FWR - Weirs, barriers, fences, etc.
SN - Seine net (Danish and Scottish seines)	DRB - Boat dredges
SB - Beach seines	HAR - Harpoons
PS - Purse seines	MISC - Miscellaneous (e.g. cast-nets and dip-nets)
GN - Gillnets (set and drift)	
4. Mesh size. In the case of trawls, seine nets, gillnets and poundnets, record the effective mesh size; for line gears record the hook size; and for dredges record the ring size.
5. Port or Sea. Indicate whether the samples were taken from the catch at sea or from the landing in port.
6. Date. Record the month and day for each sample taken by observers at sea. In the case of port sampling on a trip basis, record the month and day of landing.
7. Starting time of set. Use Greenwich Mean Time in the case of samples taken at sea; leave blank for port samples.
8. NAFO Division. Record the appropriate division (or subdivision, where applicable) for both sea and port samples.
9. Start of set position. Applicable only to samples taken at sea.
10. Fishing depth (m). Indicate the mean fishing depth for sea samples and a range of fishing depth for port samples.
11. Species sampled. Record the name of the species sampled, supplemented by the NAFO 3-digit code. If the 3-alpha species identifier is used, it should always be associated with the 3-digit code (e.g. HAD-102 could be used to designate haddock).
12. Catch or Landing. Insertion of "Catch" implies that the sample was taken at sea before any discarding, if any, had occurred, or in port with the knowledge that no fish were discarded during the trip; insertion of "Landing" implies that the sample was taken with the knowledge that some discarding of the smaller sizes of fish had occurred prior to sampling.
13. Method of measuring. Record one of the following length measurements as appropriate: total, fork, mantle for squid, carapace for shrimp, shell diameter for scallops. If other methods of length measuring are used, please specify in a note at the bottom of the form.
14. Recorded measurement. Record one of the following as appropriate: nearest cm, cm below, nearest half-cm, half-cm below.
15. Length interval. Record the appropriate length group used (i.e. 1 cm, 2 cm, 3 cm, 5 mm, etc.), especially if the sheet is used to report data for more than one species. For the "1 cm" and "5 mm" intervals, ensure that the appropriate length groups are given in the relevant columns.

NORTHWEST ATLANTIC FISHERIES ORGANIZATION
 COMMERCIAL FISHERY AGE-LENGTH KEY, 19__

Country		Vessel name		Side no.	National reg. no.
Gear		Mesh size (mm)	Port or sea	Reported by	
Month	Day	NAFO Div.	Start of set position	Lat. Long.	Fishing depth(m)
SPECIES		Sex (where applicable)	Method of measuring		Recorded measurement
Check length group in box below		Sampling method	Catch or landing		Structures for ageing
<input type="checkbox"/> 1cm	<input type="checkbox"/> 2cm	<input type="checkbox"/> 3cm	<input type="checkbox"/> 5mm	AGE-LENGTH KEY (Insert number sampled by age below)	
					Average weight* No. (g)
0	16-	15-			
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-			
Number of fish aged					
If the age-length key is based on more than one subsample, record the <u>number of subsamples</u> in the box to the right					
* If individual fish were weighed, record in the appropriate columns the number of fish weighed (No.) and the average weight-at-length (g).					

NOTES FOR COMPLETION OF FORM CFS-2

The form is designed to facilitate the reporting of individual age-length samples but may also be used for the reporting of age-length keys based on port sampling or grouped sea samples. With reference to the grouping of samples, STACRES, at its Special Meeting in November 1978, recognized the practical difficulties of obtaining suitable age-length keys corresponding to individual length samples and recommended "that data from samples taken for ageing not be combined for periods exceeding one calendar month or for areas greater than one ICNAF division (or subdivision, where applicable)". In order to facilitate data-processing, it is essential that all of the information required for each sample be entered in the appropriate spaces on the form.

1. Year. Record the last two digits of the calendar year in the space provided at the top of the form.
2. Country, Vessel name, Side number, and National registration number should always be recorded to ensure proper identification of the samples.
3. Gear. Record the appropriate abbreviation for the gear type used based on the NAFO Gear Classification for reporting sampling data. The primary abbreviations are as follows:

OTB - Bottom otter trawl (side and stern)	LL - Longlines (set)
OTM - Midwater otter trawl (side and stern)	LHP - Handlines and pole-lines
PTB - Bottom pair trawl (2 boats)	FPN - Uncovered pound nets
PTM - Midwater pair trawl (2 boats)	FWR - Weirs, barriers, fences, etc.
SN - Seine net (Danish and Scottish seines)	DRB - Boat dredges
SB - Beach seines	HAR - Harpoons
PS - Purse seines	MISC - Miscellaneous (e.g. cast-nets and dip-nets)
GN - Gillnets (set and drift)	
4. Mesh size. In the case of trawls, seine nets, gillnets and poundnets, record the effective mesh size; for line gears record the hook size; and for dredges record the ring size.
5. Port or Sea. Indicate whether the sample was taken from catches at sea or from the landing in port.
6. Date. Record the month and day if the age-length key pertains to an individual haul; indicate the most representative date of the catch if the age-length key pertains to an individual trip or landing; indicate the month if the age-length key is composed of several subsamples, but in no case must the subsamples be grouped over more than a calendar month.
7. NAFO Division. Record the appropriate division (or subdivision, where applicable) for both sea and port samples. In no case must an age-length key consist of subsamples from more than one division or subdivision.
8. Start of set position. Applicable only if the age-length key is based on a sample from a single haul.
9. Fishing depth (m). Indicate the mean fishing depth for individual sea samples, and a range of fishing depth for grouped and port samples.
10. Species. Record the name of the species sampled, supplemented by the NAFO 3-digit code. If the 3-alpha species identifier is used, it should always be associated with the 3-digit code (e. g. HAD-102 could be used to designate haddock).
11. Sex. Leave blank if data are not required to be reported by sex. However, separate keys (on separate sheets) are necessary where data are required by sex, using the designation "M" for male and "F" for female.
12. Method of measuring. Record one of the following length measurements as appropriate: total, fork, mantle for squid, carapace for shrimp, shell diameter for scallops. If other methods of length measuring are used, please specify in a note at the bottom of the form.
13. Recorded measurement. Record one of the following as appropriate: nearest cm, cm below, nearest half-cm, half-cm below, etc.
14. Sampling method. Indicate whether the age-length key is based on Random sampling, Supplemented random sampling, or Stratified sampling.
15. Catch or Landing. Insertion of "Catch" implies that the sample was taken at sea before any discarding, if any, had occurred, or in port with the knowledge that no fish were discarded during the trip; insertion of "Landing" implies that the sample was taken with the knowledge that some discarding of the smaller sizes of fish had occurred prior to sampling.
16. Structures for ageing. The usual entry will be either scales or otoliths, but, if any other structures or a combination of two or more structures are used, this should be indicated.