MANUAL
FOR
SAMPLING OF FISH
AND CRUSTACEANS

version 1.0

Editors

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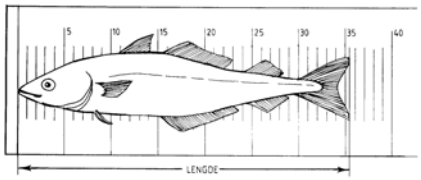

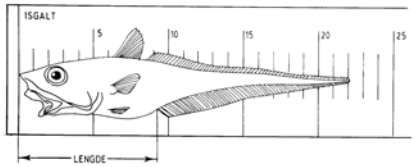

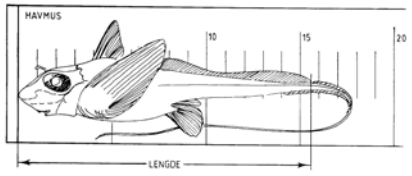

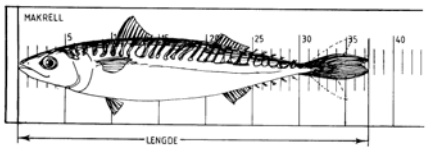

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Objective

This manual describes the procedures used in sampling of fish and crustaceans by the Institute of Marine Research (IMR), Bergen in sampling of fish and crustaceans. It includes the field sampling and the entering of data into electronic media.

The objective of the manual is to ensure that the biological material related to fish and crustaceans which is collected on board research vessels, contracted vessels, coast guard vessels, fishing vessels, as well as in factories and laboratories after landing, are sampled in a uniform manner according to specifications given here.

Contents

A group at IMR («the SPD group») is responsible for writing and revising this manual. The members of the group are Asbjørn Borge, Åge Fotland, Harald Gjøsæter and Hildegunn Mjanger. The group's mandate is given in "Prosedyre for drift av «*prosedyrer for prøvetaking og koding av fiskedata*».

The manual will be revised when necessary. Minor changes and additions will be distributed on single sheets. New editions will be printed whenever extensive revisions have been made.

The manual describes the following procedures:

Sampling of fish and crustaceans
collecting samples according to simple, pre-determined steps and a common understanding of the sampling procedures.

Analysis of fish stomachs
both the simplified and detailed analysis of stomach contents of fish.

Coding and filling of forms
coding the data appropriately in order to fill in the standard forms correctly.

Sampling for genetic analysis
collecting samples for enzyme electrophoresis and DNA analyses.

Annex to the manual
contains supplementary tables, figures, charts and forms.

For the minimum allowed length of fish in catches see «Melding fra Fiskeridirektøren: Forskrift om endring av forskrift om maskevidde, bifangst, fredningstid og minstemål m.v. ved fangst av fisk og sild».

For conversion factors for gutted (and other) weights to round (live) weight, see «Fiskeridirektoratatet, Fiskeriøkonomisk avdeling: Omregningsfaktorer fra levert produktvekt til rundvekt».

For handling of fish data from coding to entering data into the research data base, see «*Prosedyre for håndtering av fiskedata*».

Concerning preparing and reading of age material, a new manual is under preparation: "*Manual for age estimation of fish*". This manual is going to contain procedures for sampling and preparing of age material, for age estimation, and for quality assurance of the age estimation.Most of those procedures are species-specific. They will, in the long run, replace the content about these items in the present manual. During a change-over period, this material is still found in the present manual, but the reader should refer to the procedures in the *Manual for age estimation of fish* where these are finished.

Critical factors

It is assumed that samplers follow the procedures given in this manual and the coding system described here.

Individuals participating in either sampling or filling out the standard forms must familiarise themselves with this manual before the work is started.

We ask that the individuals responsible for sampling and coding inform the SPD-group of errors or omissions as well as desired changes in any of the procedures described in the manual.

Introduction

The manual for sampling of fish and crustaceans (version 1.0) describes the collection and coding of samples at the IMR. It is used by all the four fish departments at the institute (Aquaculture, Marine Environment, Fish Capture and Resources).

This manual has five chapters. Chapter 1 describes how to carry out the sampling work, which measurements to record from the various species, etc. Chapters 2 and 4 describe the collection and handling of stomach contents and genetic samples, respectively. Chapter 3 shows how to fill the collected data in the forms. Chapter 5 is an annex to the manual.

Chapter 1 also contains simplified instructions for how to fill in the standard forms (the S-, T, U-, V- and W-forms). Sub-chapter 1.10 contains species-specific information about each species. Tables 1.9.1 (p. 13), 1.9.2 (p. 14) and 1.9.3 (p. 15) summarise the biological data collected for pelagic, demersal and invertebrate species, respectively. Details of the coding system used are provided in Chapter 3. This chapter explains, column-by-column, how the standard form should be filled in.

In the Annex, Chapter 5 (p. 75), tables, figures, area charts and sample forms are found (S,T,U,V, and W).

Questions related to the manual should be directed to the editors of the book:
Asbjørn Borge, Åge Fotland, Harald Gjøsæter or Hildegunn Mjanger.

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Relevant Literature

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Objective

These procedures shall ensure that all sampling is carried out in a uniform way so as to increase the quality and reliability of the data.

Scope

These procedures described here include the following:
- Sampling of fish and crustaceans
- Filling in the standard forms S,T,U,V and W
- Species-specific sampling instructions
- Collection of otoliths and scales. See *«Manual for age estimation of fish»*
- Age reading of otoliths and scales. See *«Manual for age estimation of fish»*

1. SAMPLING OF FISH AND CRUSTACEANS

1.1 General

These procedures describe the work which is carried out on board fishing vessels when the catch is being sampled for scientific purposes. The procedures can also be used when fishing is conducted from platforms other than research vessels, e.g., commercial fishing vessels. They also apply to situations where the catch is sampled at a later stage, e.g., after delivery to a fish factory.

1.2 Filling in Fishing Station Form S

The following overview of the procedures used to fill in the standard forms is not complete. For codes not mentioned here, see coding procedure for the S-form (Chapter 3.2 p. 43).

On board research vessels and some hired commercial vessels, the S-form is filled in by the officer in charge of the bridge. If some of the columns in this form are left blank, this must be approved by the chief scientist. If the vessel is an ordinary fishing vessel or if no vessel is used (e.g., sample is collected at fish factory), the sampler must complete the form.

The series number is used to uniquely identify the sampling station and is particularly necessary when sampling is undertaken on board fishing vessels, at factories, etc. The series number has five digits, of which the first denotes which department is responsible for the sample (e.g., Aquaculture, Fish Capture, Marine Environment, or Resources). Each department is free to decide how to define the remaining four digits. This prevents the same number from being used for more than one station. The responsible department will allocate a number series for each survey.

«Condition» and «Quality» of the catch should be recorded by the sampler after observing how the fishing was carried out and how the gear performed (quality) and inspecting the gear when it comes back on deck (condition). If necessary, one should consult with the officer in charge or the fishing master. On ordinary fishing vessels these spaces are left blank if the sampler has not directly observed the gear.

When trawling with a bottom trawl on groundfish surveys where fishing station positions are predetermined, the «Quality» information is essential.

When a «multi-bag» trawl is used and it is desirable to handle the contents of each bag separately, one S-form is used for each bag. These forms should have the same fishing station number but individual and subsequent series number. Position, fishing depth, bottom depth, start time, log , stop time, fishing depth etc. should be filled in when the actual bag starts and finishes fishing. In addition, all the S-forms must be coded fishing station type «4» (S:27 = part of multi-bag trawl station).

1.3 When the catch is on deck

When the catch is on deck, the following procedures should be followed. If the catch contains specimens which differ significantly from the main lot, e.g., by size or rarity, these may be set aside from the total catch, before handling the remaining catch. Decisions regarding the further handling of the catch depend on whether it is possible to get a representative sample without sorting the total catch. Baskets with specimens selected from the total catch must be kept separate from baskets which represent a sub-sample of the total catch.

When the catch is less than approximately 15 baskets, all material should be shovelled into baskets, but only some of these should be selected for sorting. The baskets selected for sorting must contain a representative variety of the catch.

If the catch contains more than about 15 baskets, a sufficient number of baskets should be sub-sampled for sorting, the number depending on the variety of species in the catch. The total weight of the catch must then be estimated from the sub-sampled catch.

1.4 Sorting, weighing and counting

If the catch that must be sorted is of such a variety that it may be practical to sort in two steps, this should be carried outas follows:

1)Sort a sufficient number of baskets or an amount of fish to obtain a representative sample of the abundance of the smallest fish in the catch.

2) Afterwards, sort the large fish in a certain number of baskets until you have a representative sample of the number of the fish.

It is important to record how many baskets of each group are sorted.

Sorting divides the catch into species which will constitute a group. In some cases, e.g. 0-group surveys, the 0-group alone should constitute one group and other age groups are treated as a separate group. The unsorted amount in each group (species) should be weighed (or volume measured) and counted. There are special procedures for 0-group surveys of the Barents Sea which are not described here.

When only a part of the total catch is weighed and counted, the total catch of each group (species) must be calculated. Specimens selected from the catch before sorting, must then be weighed and counted. These must not be confused with the remaining catch.

1.5 About the SAMPLE concept

As mentioned in the preceding section, the final amount of each species represents either all or a subsample of that species.

When multi-bag trawl is used and it is desirable to study the catch in the bags separately, a sample of all (or subsample) is the amount we finally have left of each species from each bag.

The word «sample» is understood as the number of specimens of a species extracted from a catch for closer examination, e.g., individual sampling.

Occasionally, it is necessary to remove several groups of the same species. For this purpose the term «subsample» is introduced.

A subsample or a sample constitutes one line in the T-form.

A situation which makes it necessary to take more than one sub-sample is when the catch is already sorted one way or another, e.g. all the large specimens of cod were separated from the total catch before random sampling could take place.

Different measurements can be made on one sample.

There may be length measurements only or stomach analyses. Individual sampling (or biological sampling) is a more detailed study of each specimen where various biological parameters are measured in addition to length (e.g. age, weight, sex, maturity). Stomach analyses record the contents of the stomach, weight, species and number of prey.

If multi-bag trawl is used, and it is desirable to study the contents of each bag separately, a T-form (with the necessary U-, V- and W-forms) is filled in for each bag.

1.6 Filling in the T-form

The following description of the filling of the T-form is incomplete. For codes not mentioned here, see the coding procedures for the T-form (chapter 3.3, p. 51).

Valid species names are found in Table 4 of the annex (p.84). The list is based on the NODC (National Oceanographic Data Center, U.S Department of Commerce) taxonomic list. If the species name does not take all the twelve positions additional remarks may be added, e.g., marking a catch for a special purpose or designating sub-species or special groups of a species. Such a remark should be separated from the species name using an apostrophe (‘).

Part number is usually 1, since the standard procedure is to take one sample of each species at each station. If several samples (part samples) are taken, they are given consecutive part numbers and each part number is assigned a line on the T-form. When only the length frequency are measured, it is called sample type 10. When individual sampling for age, weight, maturity etc. is carried out it is called sample type 20 or 21. For king crab, part number may be used to differentiate between females (part number 1) and males (part number 2).

The code titled «group» tells whether the sample/sub-sample is taken from a selected part of the catch. When random sampling is carried out (i.e., the sample is representative of the whole catch for this group), this space may be left blank (i.e., when the sample type is 20 or 21) (p. 51). If the sample is not representative of the whole catch with respect to length, weight, sex, age, etc., the «group» column should be coded 49. If the sample/sub-sample is taken from a catch delivered to a fish factory, the code will be 26, 27 or 28. For further information of «group» coding , see sub-chapter 3.3 (p. 51).

Catch measurement designates the unit used on this line. Normally, this is coded as 1 which indicates that the unit is the round weight in kilograms (kg).

Catch weight/volume refers to the amount of catch of the actual species (by part number) represented by the measurements on this line. Normally, a line will represent the whole catch of a species. If an additional sub-sample is taken for a special purpose, this sample represents

itself only, i.e., in the space for catch weight and number, the weight and number of the sample are filled in. For other sub-samples, e.g. large cod, the catch quantity will be the lot which was taken out before sorting. Note that the weight is recorded in grams.

The number of fish in the catch is found by dividing the total weight of this group by the mean weight. The mean weight is found by taking the weight of the sample divided by the number in the sample. The number is rounded off to the nearest whole figure.

$$Catch\_number = closest\_\text{integer}\left(\frac{Length\_sample\_number}{Length\_sample\_weight}\right) \times Catch\_weight$$

The weight and number of length measurement samples should always be recorded. The number of fish that were individually sampled should be recorded (sample type 20 or 21). The otolith/scale space should be filled in if the individual sampling includes age reading (scale readings coded as 1 and otolith readings as 2). Parasites are coded using 1 or 2 if parasite data are recorded. Stomach sampling is coded with 1 if simplified analysis is carried out, or with 2 when full analysis is done or the sample is frozen for complete analysis later. This is done only when special stomach sampling is carried out, not when stomach filling and degree of digestion are recorded on the V-form. Further information about stomach investigations is provided in Chapter 2 (p. 34). The genetic column is coded as 1 when samples for genetic analysis are collected.

1.7 Sampling

The sample should be drawn randomly from the group it is representing. For larger fish it is best to take the fish consecutively from the baskets until reaching a pre-determined number. For smaller fish, e.g., capelin, the specimens should be taken from a tray containing all of the fish in the sample.

In general, the length distribution of all species in a catch should be recorded. Species of commercial importance are given priority. The chief scientist will decide the extent of the sampling for each species. For further information on species-specific sampling see Chapter 1.10 (p. 16).

For pelagic fish (including sprat, blue whiting, capelin, mackerel, North Sea herring, Norwegian spring-spawning herring, polar cod and argentines) individual measurements are usually made for a representative number of individuals (sample type 20), approx. 100 fish if possible. On occasion, a length-stratified sample of North Sea herring will be taken for individual measurements (sample type 21). The length-stratified sample normally consists of a maximum of 10 fish in each cm group. If fish which were not measured as part of the length-stratified sampling must be added to complete the length groups, these fish should not be entered into the U-form. Occasionally, one may have fewer specimens in the «specimen sample» than in the measurement sample. In that case, take care that this «specimen sample» is representative of the whole catch.

Normally all specimens in the length frequency sample should be entered in the U-form, also when they are included in the «specimen sample».

For demersal fish individual sampling is usually length-stratified (sample type 21). Length measurements should be done continuously and randomly. Individual sampling is done on a fixed number, e.g., 5 fish in each 5 cm group. When one length group is full, the next fish in that group is recorded in the length frequency form only (U-form) and not in the individual sampling form (V-form). Sampling continues until a satisfactory sample has been collected (normally 100 fish) or until all the length groups are full. If the sample comprises the whole catch, it is still coded as 21.

With respect to the number of fish in an individual sample, the chief scientist may decide whether deviation from the standard sample size is permissible. Variables to be measured by individual sampling varies from species to species (see Tables 1.9.1 (p. 13), 1.9.2 (p. 14) and 1.9.3 (p. 15).

For cephalopods and periphylla measurements of about 100 specimens are taken when available.

For Norwegian Sea surveys the following additional sampling should be carried out:

All krill collected in one sample are classified as «Krill». Note that krill have a slightly bent back and the eyes stand on short stalks. The wet weight of this sample or sub-sample is recorded. It must be noted in the journal how large a part of the total sample the weighed sample constitutes so that this value can be used to find the total weight. The sample or sub-sample is then preserved in formaldehyde (4%). The proportion of the sample which has been preserved is recorded on the sample bottle or in a journal. This sample will be used for identification and length measurements, procedures which are sometimes completed on board before preservation.

All shrimp collected in one sample are classified as «Shrimp». Note that shrimp have a bent back and the eyes stand on stalks. Follow the same procedures as for krill.

Amphipods are sorted into a single group called «Amphipods». Note that amphipods are compressed sidewise (e.g. seaweed flea). Follow the same procedures as for krill.

1.8 Filling in the length frequency form U

For a full explanation, see the coding procedures used for the U-form (Chapter 3.4, p. 57).

Whenever possible the length frequency of every species present in the catch should be recorded. The length frequency distribution is recorded using the standard U-form. Data from these sheets are then entered into the database. The computer program used for data entry subsequently produces the completed U-form. Table 1.8.1 (below) tells which length intervals to use for the different species.

1.8.1 Table 1. Length intervals used for selected species.

Length interval	Species
1 mm	0-group measured on international 0-group surveys in the Barents Sea; shrimp from Greenland and the North Sea; salmon, trouth and rainbow trout under 30 cm. Cephalopods, jellyfish, small fish, shrimp from Norwegian Sea surveys. King crab from research surveys.
5 mm	Sprat, herring, capelin, polar cod, blue whiting, salmon, trouth and rainbow trout from 25 m, king crab. Periphylla in Norwegian Sea surveys.
1 cm	Other species, including king crab from commercial samples. Salmon, trouth and rainbow trout 50 cm or larger.
3 cm	Older data and calculations.
5 cm	Older data and calculations.
0.5 mm	Shrimp from the Barents Sea.

1.9 Filling in the specimen form V

For complete instructions, see the coding procedures for the V-form (Chapter 3.5, p. 59).

The V-form is used when other biological data are collected in addition to length. Tables 1.9.1 (p. 13) , 1.9.2 (p. 14) and 1.9.3.(p. 15) show which variables are recorded and identifies the corresponding columns for pelagic, demersal and invertebrate species, respectively. For further information, see Chapter 3.5 p. 59.

1.9.1 Table 1. Variables measured in individual sampling of pelagic species .

Parameter	Herring	Capelin	Blue Whiting	Polar cod	Sprat	Mackerel	Argen-tines	Salmon, trouth and rainbow trout
Weight/Vol.	* c	* c	* c	* c	* d	* c	* c	* a
Length	* f	* f	* f	* f	* f	* g	* g	* b
Fat	*							
Sex	* h	* >8cm	* >10cm	* >8cm	* d	*	*>15c	*
Maturity			* >10cm	* >8cm			m	*
Special maturity	* h	* i	* d		* d	*	*>15c	
Stomach fill	*		*	*			m	*
Degree of digestion		* >8cm	* j					
Liver/Parasites							*	
Vacant	* r							
Vacant	* q							
Vacant	* q							
Vacant	* q							
Vertebrae	* d							
Age	* k		*otol	*otol	* l	*otol		*s
Spawning age		*otol						
Spawning zones							*otol	
Legibility	* m		* m	* m	* m	* m		
Type	*	* m						
Edge	* d						* m	
Nucleus	* o							
Calibration	* p		* p	* p				
Growth zones	*	* p	*	*				
Tag number	* d	*				*	* p	
Gonad weight/ liver weight							*	
Gutted weight/vol.								

* indicates that this variable should be coded for this species.

a) Weight<100g 0.1g precision.
   100-999g 1 g precision.
   >1000g 5 g precision.
b) Length (both fork and total length):
   <25 cm measured to the nearest mm.
   25-50 cm measured to the nearest mm.
   >50 cm measured to the nearest mm.
c) Weight in g.
d) According to specific instructions.
f) Length in 5 mm intervals.
g) Length in 1 cm intervals.
h) Norwegian spring spawning herring: over 20 cm. Other herring: over 15 cm.
i) Over 8 cm; female capelin: «Forberg-stage», male capelin: herring/capelin table.
j) (V:63) used to code pseudobranchial tumor in blue whiting.
k) 0-group, take otoliths. North Sea herring: Take otoliths, others: take scales.
l) Take otoliths from fish >8 cm.
m) When age is read.
o) When otoliths are read.
p) When growth zones are measured.
q) (V:64-66) used for coding fungus decease in herring.
r) (V:63) coast rings, according to specific instructions.
s) Scales and otoliths.

1.9.2 Table 2. Variables measured in individual sampling of demersal species.

Parameter	Cod	Had-dock	Saithe	Redfish [1]	Green-land Halibut	Sandeels	Norway pout	Whi-ting
Weight/Vol.	* a	* a	* a	* a	* a			
Length	* b	* b	* b	* b	* b	* b	* b	* b
Fat								
Sex	*	*	*	* c	*c	*	*	*
Maturity	*	*	*	* c	*c	*	*	*
Special maturity					*f			
Stomach fill.	* d	* d	* d		* d			
Degree of digestion	*	*	*		*			
Liver/parasite								
Vacant	* h							
Vacant	* i							
Vacant								
Vacant								
Vertebrae								
Age	* e	* e	* e	* e	* e	* e	* e	* e
Spawning age	*	*	*	*	*	*	*	*
Spawning zones	*	*	*	*	*	*	*	*
Legibility	*j	*j	*j	*j	*j	*j	*j	*j
Type	*							
Edge	*	*	*			*	*	*
Nucleus								
Calibration								
Growth zones								
Tag type	* g							
Tag number	* g							
Gonad weight/	* g							
liver weight	* g							
Gutted weight/ vol.	* g							

* indicates that the variable should be measured for this species.

a) Weight in g.
b) Length in 1 cm intervals.
c) Measured for fish >20 cm.
d) Take stomach samples (see Chapter 2, p. 34) according to specific instructions. Stomach fill is not to be recorded.
e) Otoliths.
f) Females only.
g) Sea-ranched cod.
h) (V:63) «Black spot disease» according to instructions..
i) (V:64) Gillworm according to specific instructions.
j) With reading of age.

[1] Valid for *Sebastes marinus* and *Sebastes mentella*.

1.9.3 Table 3. Variables measured in individual sampling of crustaceans.

Parameters	Shrimp	King crab
Weight/Vol.		* b
Length		* c
Fat		
Sex		* e
Maturity		* d,g
Special maturity		* d,h
Stomach fill		* d
Degree of digestion		* d
Liver/ Parasite		* f
Vacant		
Vacant		
Vacant		
Vacant		
Vertebrae		
Age		
Spawning age		
Spawning zones		
Legibility		
Type		
Edge		
Nucleus		
Calibration		
Growth zones		* d,a
Tag		
Gonad weight		
Liver weight		

* indicates that this variable should be measured for this species.

a) See tag type (V:101) (p. 59).
b) Weight in g.
c) See Chapter 1.10 Species specific sampling instructions, king crab (T:61) (p. 51).
d) According to specific instructions.
e) Sex for shrimp (see p. 57)
f) Coded as for length measurement (T:61).
g) See maturity stage scale, Table 10a (p. 100).
h) See Table 10b (p. 100) for moulting stages.

1.10 Species-specific sampling instructions

This sub-chapter describes how sampling is carried out for the different species. It also defines the species-specific codes to complete the standard forms. See Table 1.9.1 (p. 13), 1.9.2 (p. 14) and 1.9.3 (p. 15) for further details.

1.10.1 Cephalopods in Norwegian Sea surveys

Name (T:28-39): GONATUS

The decapod Gonatus is recognised by a claw (hook) on the two longest tentacles. Fig. 2 (p. 104). Mantle length is measured in mm.

1.10.2 Greenland halibut *(Reinhardtius hippoglossoides)*

Norwegian name (T:28-39): BLÅKVEITE

Maturity: Use the scale General description of maturing (Table 5, p. 94) and code it under Stage (V:56). Stage is coded for both sexes. In addition, maturity for females are coded under Spesial maturity according to the scale in (Table 8b, p. 98) This is carried out in 1998 and 1999 for greenland halitbut. On some surveys it may be desirable to use Special maturity stages. This is decided by the chief scientist. Special stages are found in Table 8 (p. 97). When special stages are used, this must be noted on the otolith envelope or other suitable place to prevent errors when the V-form is completed and when the data are punched.

1.10.3 Sprat *(Sprattus sprattus***)**

Norwegian name (T:2839): BRISLING

Maturity: Use special maturity stage scale for herring, capelin and others., Table 6 (p. 95). Code it under special stage (V:57-58). Special codes for sprat, see special codes for herring (p. 24) (V:64-66).

1.10.4 Whiting *(Merlangius merlangus)*

Norwegian name (T:28-39): HVITTING

Maturity: Use the scale General description of maturing (Table 5, p. 94) and code it under Maturity (V:56).

1.10.5 Haddock *(Melanogrammus aeglefinus)*

Norwegian name (T:28-39): HYSE

Maturity: Use the scale General description of maturing (Table 5, p. 94), and code it under Maturity (V:56). Special stage may have been used in older (historical) samples (Table 8, p. 97).

1.10.6 Blue whiting *(Micromesistius poutassou)*

Norwegian name (T:28-29): KOLMULE

Maturity: Use the special maturity stage description (V:57-58) given in Table 7 (p. 96).

Gill tumor (pseudobranchial tumor) (V:63): Gill tumor is coded in the free column 63 according to the following scale:

Not investigated	blank
No tumor present	1
Tumor on one side	2
Tumor on both sides	3

A tumor is shown in the photo on p. 105 (Figure 3).

1.10.7 King crab *(Paralithodes camtschatica)*

Norwegian name (T:28-39): KONGEKRABBE

Maturity: Use the scale Description of maturing (Table 10a, p. 100), and code it under Maturity (V:56).

Shell stage: Use the scale shell stages (Table 10b, p. 100, and code it under special maturity stage (V:58). Code for maturity stage and special maturity stage may be filled in for the same specimen.

Several length measurements may be recorded for king crab, see length measurement (T:61, p. 51). A crab may be measured in more than one way. If this is done, a new V-form is prepared with the same specimen number, code for length measurement in column (V:63) and with codes as in column (T:61).

If tagged king crabs are captured, see (T:101, p. 59) and «*Instructions for recaptured tagged king crab*». For details of the stomach analysis of king crab, see «*Procedures for analysis of fish stomachs*».

A station number may comprise one or several fishing station forms. The fishing stations may have different positions within a small area. For the same station number there may be one or several series numbers. Each fishing station form has one unique series number. The spaces for gear, gear code and gear number (S:50-57) are defined as follows:

1 A single creel, or several creels where the total catch is lumped together.
2 Creels on a chain where each creel is registered separately.

	Number of gear (S:50-51)	Gear code (S:52-55)	Gear number (S:56-57)
1	number of creels	code for this gear	blank
2	number of the chain the creel is fastened to	code for this gear	number of the creel

1.10.8 Salmon, trout and rainbow trout *(Salmo salar, salmo trutta and salmo gairdneri)*

Norwegian name (T:28-39): LAKS, AURE AND REGNBUEAURE

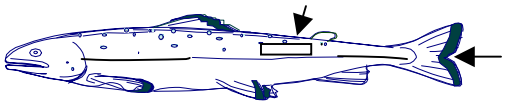
Sexual maturity: The general maturity description, table 5 (page 96) has been used up to 31.12.2001, and has been coded under stage (V:56). Only stage 1 (immature), 2 (maturing), and 4 (spent, may be encountered in both smolt and larger fish) used on salmon, trout and rainbow trout.

From 01.01.2002 use the maturity description listed in table 5.1.13 (page 103), and code under special stage (V:57-58).

Always check a) Adipose fin cut off? If so, make a note in sampling sheet.
b) White spot in one or both eyes. Note in sampling sheet.

Scale samples from this area

Length to be measures from tip of the snout to the middle of the tail fork, when placed spread out on the measuring board



General:
All salmon, trouth and rainbow trout caught by IMR's research vessels are length measured (fork length) and weighed (see «Standard samples» below). Each specimen is frozen in a plastic bag marked with survey number, station number and fish number. It should be frozen as soon as possible. These samples will be further studied ashore.

NB! If survey participants or vessel's crew want a taste of the fish they have participated in catching, the specimen must be marked with the name and telephone number of the «owner», and he may have it returned as soon as the laboratory have all necessary measurements and

samples. The fish will be handled as gently as possible, and the «owner» will be called and told when and where he can pick up the fish.
Sometimes it is of interest to finish the sampling on board. If that is the case it will be decided before the survey starts, and the instructions below are to be followed:

Standard samples:

Weight (V:45-49):	0-999g	measured with 1 g precision
	> 1000 g	measured with 5 g precision
Length (V:51-53)	- under 25 cm	measured in 1 mm intervals
	- 25 cm and over	measured in 5 mm intervals
	50 cm and over	measured in 1 cm intervals

Fork length is used for salmon, trouth and rainbow trout (T.61) (p. 51).

Sexual maturity: Use the general maturity description (Table 5, p. 94) and code it under Stage (V:56). Only three stages of the scale are used for salmon, trouth and rainbow trout: 1 (immature), 2 (maturing) and 4 (spent - may be encountered in both smolt and larger fish).

Always check	a)	Adipose fin cut off?	If so, make note in sampling form
	b)	White spot in one or both eyes.	Note in sampling form.

Special samples:

1. Genetics (T:79)
   Small salmon, trouth and rainbow trout: The head with an ample piece of flesh at the neck is cut off. Cut out the liver and put inside head. Put head with liver in a plastic bag and mark with station number, fish number, date, year and vessel. Cool immediately and freeze as soon as possible.
   Large salmon, trouth and rainbow trout: Cut off a piece (some grams) of the liver, cut off head and proceed as for small salmon, trouth and rainbow trout.

2. Stomach/intestine: Degree of stomach filling filled in the form (V:59)
   Stomach and intestine are cut loose at anus and gullet (throat) and placed in a plastic bag marked with station number, fish number, date, year and vessel. Freeze as soon as possible.

3. Finally the whole fish is frozen in a bag with station number, fish number, date and the vessel's initials or a place name (if sampling is done during field work on land).

4. *Age readings are to be placed in the following columns:*

   (V:69-70) *Age read from otoliths.*
   (V:71-72) Smolt age in years read from scales. Smolt age is number of years in the river.

(V:73-74) Sea age in years read from scales. Sea age is number of years at sea.
(V:81-98) Growth zones measured from scales.
(V:99-100) Total scale size. If value exceeds 99, enter only the last two digits.

Each special sample (parts 1-4) is collected in one larger bag, marked with contents (stomach, gonad, etc.). Scale envelopes are collected in cardboard boxes (see special instruction for scale sampling).

1.10.9 Capelin *(Mallotus villosus)*

Norwegian name (T:28-39): LODDE

Maturity:

Female capelin: When it is possible to use special stages («Forberg-stages»), only these should be coded. Illustrated instructions for the coding of the Forberg stages is found in Chapter 5.3 (p. 109). Otherwise, use the same scale as is used for herring and capelin (Table 6, p. 95). The code is entered in the special maturity stage column (V:57-58) and the stage column (V:56) is left open.

Male capelin: Use the same scale as is used for herring and capelin (Table 6, p. 95). Code is filled in the special maturity stage column (V:57-58).

1.10.10 Mackerel and horse mackerel *(Scomber scombrus and Trachurus trachurus)*

Norwegian names (T:28-39): MAKRELL and TAGGMAKRELL

«Pir» is a juvenile mackerel, < 30 cm.

Length (V:51-53): Total length of the mackerel is defined as the distance from the tip of the snout to the end of the tail when the upper and lower lobes are pressed together. As a general rule, the mackerel length is measured in 1 cm intervals. «Pir» (juveniles) may sometimes be measured at 5 mm intervals. This will be decided by the chief scientist.

Maturity: Use the special maturity stage table for herring, capelin, etc. (Table 6, p. 95) (V:57-58).
The same for horse mackerel.

1.10.11 Jellyfish on Norwegian Sea surveys

Norwegian names (T:28-39): BRENNMANET, GLASSMANET, PTYKOGENA, PERIFYLLA, STORMANETER, SMÅMANETER

Corresponding English names SEA NETTLE, COMMON JELLYFISH, PTYKOGENA, PERIPHYLLA, SCYPHOZOANS, HYDROZOANS

Common jellyfish, ptykogena and sea nettle are weighed together. Diameters are measured. For ptykogena the largest diameter is measured excluding the tentacles when the specimen is laying flat.

Ptykogena is a jellyfish that resembles the upper quarter of a glass ball (sphere). The body is quite firm and has a greyish green cross in the centre. Grows to 9 cm diameter.

1.10.12 Polar cod *(Boreogadus Saida)*

Norwegian name (T:28-39): POLARTORSK

Maturity: Use the general maturity description (Table 5, p. 94) and code it under stage (V:56).

1.10.13 Shrimp *(Pandalus borealis)*

Norwegian names (T:28-39): REKE, DYPVANNSREKE

Corresponding English names: SHRIMP, PRAWN, NORTHERN PINK SHRIMP

For shrimp, krill and amphipods sampled during Norwegian Sea surveys, see Chapter 1.7 (p. 10). Carapax length is measured on all kinds of shrimp, (T:61, p. 51).
Length interval (U:41): Shrimp from Greenland waters and from the North Sea are measured at 1 mm length intervals. Shrimp from the Barents Sea are measured at 0.1 mm, but are registered at 0.5 mm length intervals.

Sex/maturity (T:43-44): Use special maturity stage, see description under Chapter 3.4 (p. 57) of the length frequency form (U:42).

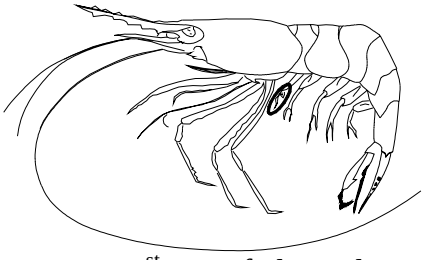
When processing a shrimp sample, take about 200-300 specimens for length measurement. Sort the sample according to sex and stage. Each sex/stage occupies a line on the U-form. Number and weight of the whole sample is recorded on one line in the T-form, with total catch weight and number entered on the same line.

LENGTH MEASUREMENT AND SEX DETERMINATION OF SHRIMP

Length measurement: From the back end of the eye opening to the upper dorsal edge of carapax.

Length measurement of shrimp

Sex determination: The shrimp is transsexual. It appears first as a male, then it changes sex (intersex), and lives the rest of its life as a female. The sex of a specimen may be determined on the basis of the shape of the endopodite of the first pair of pleopods.

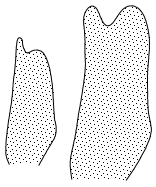


1st pair of pleopods

Male ♂

Carapax length 6-22 mm

The male part of the endopodite has been transformed to a reproductive organ. In young males this organ is thin and long, and rises above the apex of the endopodite (1). In older males this organ is considerably wider compared to the length (1) and hardly rises above the apex (2).

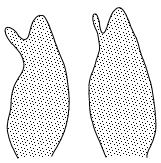


1 2
1= young male
2= older male

Intersex ♂♀

Carapax length 18-23cm

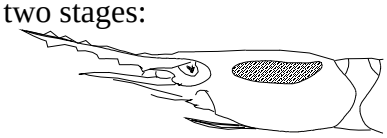
The reproductive organ is continuously reduced in size with every moulting (3 and 4), and does not rise above the apex.



3 4
3 and 4, changing sex

The intersex can be divided into two stages:

With head roe: HR
Blue-green colour



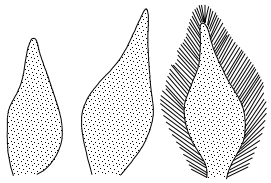
Shrimp with head roe

Without head roe:WR

Female ♀

Carapax length 18-30 mm

The reproductive organ is gone. The Endopodite is pointed (5 and 6). In females where the eggs have been hatched, the endopodite has long setae (hair) on the pleopods (7).



5 6 7

5 = young female, 6 = older female, 7 = female with setae on the pleopods.

The females may be grouped into 5 stages:

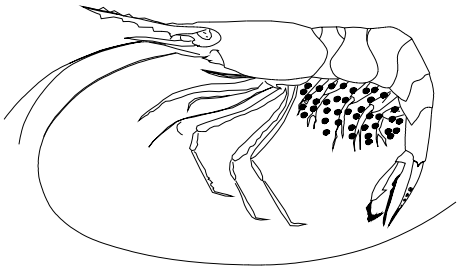
With head roe: HR

Without head roe: WR

Exterior roe without eyes: ER-E

Exterior roe with eyes: ER+E
black spots in the eggs.

Newly hatched eggs with long setae on the pleopods. JH



There are also important transitional stages, rare in each sample, which are important for identification of the population as first or second time spawners.

Females with newly hatched eggs and head roe: JH/HR

Females with exterior roe, with eyes and head roe: BR+E/HR

Females in the process of hatching BR+E/JH

Females in the process of hatching with head roe: BR+E/JH +HR

Spawning females with some head roe left, may also appear: BR-E/HR

Pay attention to samples where a mixture of females with exterior roe and eyes (BR+E) and females with exterior roe but without eyes (BR-E) appears.

1.10.14 Saithe *(Pollachius virens)*

Norwegian name (T:28-39): SEI

Maturity: Use the scale for general maturity description (Table 5, p. 94) and code it under stage (V:56).

1.10.15 Herring *(Clupea harengus)*

Norwegian name (T:28-39): SILD

In the free space after the fish name there is room for specification of herring type: 'G05 for North Sea herring and 'G03 for Norwegian spring spawning herring. Other types, e.g., Trondheimsfjord herring and White Sea herring, are assigned a code of 'G07.

Maturity: Use the scale for capelin and herring and code it under special stage (V:57:58) (Table 6, p. 95). Stage (V:56) is not used.

Number of coastal rings (V:63). Concerning historical material (until 1974) on Norwegian spring spawning herring.

Number of oceanic rings (V:64). Concerning historical material (until 1974) on Norwegian spring spawning herring.

Fungus infection: (V:64-66) Fungus infection (from 1992, onwards) coded as follows:

Not checked	blank
No disease	1
Minor symptoms	2
Strong symptoms	3

(V:64): Spores in heart tissue discovered by microscopy. Microscopy carried out only if ordered by the chief scientist.

(V:65):External symptoms (boils and ulcers).

(V:66):Changes in the heart (whitish lumps on the surface and/or within the heart muscle).

As a general rule herring should be checked for disease even when no biological sample is taken. Length and weight of the fish is recorded when the disease check is carried out.

NB! The coding scale is different from the one used earlier when a special «fish disease form» was completed.

Vertebrae (V:67-68): When vertebrae are counted, it should be carried out according to the instructions given in Figure 4 (p. 106).

Type (V:76): Is noted when age is read, according to the following scale:

Not decided	blank
North Sea autumn spawner	1
North Sea spring spawner	2

Norwegian spring spawner	
northern type (scale marking)	3
southern type (scale marking)	4

1.10.16 Sandeel family *(Ammodytidae)*

Norwegian names (T:28-39): SILFAMILIEN, SMÅSIL, HAVSIL, STORSIL, GLATTSIL
Corresponding English names: SANDEEL FAMILY, LESSER SANDEEL, SANDEEL, GREATER SANDEEL, SMOOTH SANDEEL

Within the genus AMMODYTES it is only occasionally necessary to distinguish between the various species. The name «Tobis» is used as genus name in Norwegian.

Maturity: Use the general scale for maturity description (Table 5, p. 94) and code it under stage (V:56).

1.10.17 Small fish on Norwegian Sea surveys

Some mesopelagic and bathypelagic species will easily lose the fin rays of the tail when caught by trawl. Therefore standard length (tip of snout to tail base) is used for length measurements of these species. Length is measured in millimetres. Species of interest are members of the Light fishes (*Gonostomatidae*), Hatchet fishes (*Sternoptychidae*), Scaly dragon fishes (*Stomiidae = Stomiatidae*), Barracudinas (*Paralepididae*) and Lantern fishes (*Myctophidae*).

1.10.18 Cod *(Gadus morhua)*

Norwegian name (T:28-39): TORSK

Maturity: Use the scale general maturity development (Table 5, p. 94) and code it under stage (V:56).

Special stage scale has been used in historical material (Table 8, p.97).

Type (V:76):	Coastal cod	1
	Coastal cod, uncertain	2
	Spitzbergen type	3
	Skrei, uncertain	4
	Skrei	5

Black spot disease (V:63): Is coded in the free column 63, according to the following scale:

Not checked	blank
None	1
A few	2

Many	3
Very many	4

Gillworms (V:64): Is coded in the free column 64, according to the following scale:

Not checked	blank
No worms	1
Worms present	2

1.10.19 Scorpion fishes, *(Scorpaenidae)*

Norwegian name (T:28-39): VANLIG UER, SNABELUER, LUSUER, UERFAMILIEN
Corresponding English name: GOLDEN REDFISH, DEEPWATER REDFISH, SMALL REDFISH, SCORPION FISHES

Maturity: Use the general maturity scale (Table 5, p. 94) and code it under maturity stage (V:56). On some surveys it may be of interest to use special maturity stages. This is decided by the chief scientist. Description of special stages is found in Table 9 (p. 99). When special stage is used, this must be noted on the otolith envelope or other suitable place to avoid errors when the data are filled in the form or registered (V:57-58).

1.10.20 Greater argentine *(Argentina silus)*

Norwegian name (T:28-39): VASSILD

Maturity: Use the general maturity scale (Table 5, p. 94) and code it under stage (V:56). Occasionally it may be of interest to use the special stage scale. This will be decided by the chief scientist. The special stage scale is described in Table 7 (p. 96) (V:57-58).

1.10.21 Norway pout *(Trisopterus esmarkii)*

Norwegian name (T:28-39): ØYEPÅL

Maturity: Use the general maturity scale (Table 5, p. 94) and code it under stage (V:56).

1.10.22 Norway lobster *(Nephrops norvegicus)*

Norwegian name (T:28-39): SJØKREPS

Length interval (U:41): Measured in 1 mm length intervals, separately for males and females (U:42)

1.11 Collection of otoliths and scales

See *«Manual for age estimation of fish»*

1.11.1 Scales

Scales should, if possible, be selected from the same body area in all fish and preferably along the lateral line between the gill cover and the perpendicular from the anterior dorsal fin. A sufficient number should be taken to obtain about 4-5 good scales for preparation. Before the scales are taken, stroke the area from front backwards with the tweezers to remove any loose scales that may have come from other fish. Place the scales on a blotting paper within numbered squares (the paper is soaked in water and placed in a box). When the sampling is finished, the scale is cleaned (to remove the pellicle that covers it) and placed on a microscope slide which has a layer of gelatine (use tweezers). Place 4-5 scales from each of two specimens on a single slide. The slides must be numbered with permanent ink beforehand. The scale is slightly curved and must be placed on the slide with the convex side upwards.

If the scales cannot be prepared on slides immediately after sampling, they must be frozen immediately to prevent them from drying up.

1.11.1.1 Scales from Scorpion fish

When scales are taken from redfish, these should be collected for every second otolith sample. Then scales and otoliths are both collected. As soon as possible after the catch has been sorted, 40-50 scales are taken from each specimen, preferably from the area around and under the pectoral fin. Use a knife to scrape off the scales. Clean the knife for each fish. Put the scales in an envelope with the otoliths (see Otoliths below).

1.11.2 Otoliths

Treatment of otoliths varies with species. The standard procedure used for most demersal and pelagic species is described in the following paragraph. Specialised procedures used for selected species or group of species are given in the following sub-chapters.

For most of the demersal species, the otoliths are put directly into small envelopes. The pelagic species are handled in the following way: First the otoliths are placed on a plate in small waterfilled cavities. After the sampling is finished, the otoliths are cleaned by rubbing off the tissue sack with the fingers or with a small brush. The otoliths may also be frozen for later preparation. In that case the otoliths are put in a box on moist blotting paper within numbered squay and frozen as soon as the sampling is finished.

1.11.2.1 Sprat, Capelin, Herring, Sandeels, Argentines

See *«Procedure for dissectioning and preparing of age material on pelagic fish»*

The otoliths are placed on small black plastic plates with numbered cavities. Smaller plates are used for sprat, capelin, mackerel, herring, whereas larger plates are used for argentines. These plates must be labelled and the label on the first plate of a sample must contain series number, station number, position, date, vessel name and no 1-25. The next plate is marked with series number and no. 26-50, etc.

Sprat, capelin, herring: The otolith pair is mounted with the most convex side up and with the straight sides outwards.

Argentines: The otolith pair is mounted with the convex side down and with the straight sides inwards. When the otoliths have dried, they must be completely covered with Histokitt or other similar mounting medium.

The Histokitt on the plates must be completely dry before storing. For some types of mounting media, drying in a heater may be necessary.

NB: ALL AVAILABLE TYPES OF MOUNTING MEDIA CONTAIN ORGANIC SOLVENTS THAT MAY CAUSE BRAIN DAMAGE AFTER LONG TERM USE (INHALATION). THEY MAY ALSO BE HARMFUL BY SKIN CONTACT. ALWAYS USE PROPER VENTILATION SYSTEMS AND AVOID GETTING THE SUBSTANCE ON YOUR SKIN.

1.11.2.2 Blue whiting

See *«Procedure for dissectioning and preparing of age material on pelagic fish»*

The otoliths are placed in numbered envelopes. The first and last envelope of the sample must have the necessary reference data including series number.

1.11.2.3 Salmon, trouth and rainbow trout

See *«Procedure for dissectioning and preparing of age material on pelagic fish»*

On board only scales are taken. Scrape the slime off carefully before the scales are taken. Take 15-20 scales, if possible from the 2nd to 5th scale row above the lateral line in the area between the dorsal fin and the adipose fin. The scales are placed on a piece of paper which is then folded over once. The paper is then placed in a special salmon, trouth and rainbow trout scale envelope or in paper otolith envelopes marked with date, year, survey number, station number and fish number. Length, weight, sex and maturity should also be recorded. If the scales are taken from other areas of the fish than the one recommended above, this must be noted on the envelope. This may be necessary if the fish is caught by trawl where scales are often worn off. The otoliths are also placed on paper which is folded over and placed in the same envelope as the scales.

1.11.2.4 Mackerel

See *«Procedure for dissectioning and preparing of age material on pelagic fish»*

If the otoliths are prepared immediately after the sampling is finished, the same procedure is followed as for sprat, etc. If the otoliths have been frozen, they should be handled the following way: dip the otolith in a solution of 2% CaOH, wash away any tissue, rinse in water and place each pair in a numbered well on the black plastic plate. Dry them in a heater at about 40 degrees Celsius for about 24 hours. Then put on 2-3 drops of Histokitt, let it dry and add more until the otoliths are completely covered. The plates must not be bundled together before they are read. Instead, keep them laid out on a tray.

1.11.2.5 Polar cod

See *«Procedure for dissectioning and preparing of age material on pelagic fish»*

The otoliths are placed dry in the cavities of a «Microwell» plate. A piece of elastic plastic is laid over before the lid is put on and taped to the plate. A label is put on the lid with station number, series number, position, date and vessel name. These plates have 96 wells numbered 1-12 horizontally and from A to H vertically. A standard («full») sample of polar cod has therefore 96 specimens. The sequence of otoliths in the wells is first A1 up to A12 with the 13^{th} specimen in B1, the 14^{th} in B2, etc.

1.11.2.6 Greenland halibut, whiting, haddock, saithe, cod, redfishes (Scorpionfishes), Norway pout

Fish number, length, weight and maturity stage are filled in the space marked on the envelope for these data, and the otoliths are placed in the envelope. It is essential that the fish number is marked on the envelope. The envelopes of one sample are put in a larger paper bag with all necessary data from the S-form. N.B.: Do not use plastic bags for storage.

1.12 Age reading of otoliths and scales

1.12.1 General

See *«Manual for age estimation of fish»*

This sub-chapter explains the methods used to determine age, spawning age and spawning zones (V:69-74), the codes used to describe otolith legibility (V:75) and calibration (V:79-80), and how to measure growth zones (V:81-100). Species-specific methods are explained in individual paragraphs for each species or species group.

It is essential that the reader distinguishes, zones from rings. A zone is normally a wide area of either hyaline or opaque material constituting one or more rings.

Pelagic fish
Count the hyaline zones (winter zones; dark in reflected light) on the otoliths, the number of winter zones on the scales.

Redfishes (Scorpion fishes)
Count the hyaline zones (winter zones; dark in reflected light) on the otoliths, number of zones on the scales.

Greenland halibut
Count the opaque zones on the otolith (summer zones; dark in penetrating light from below).

January 1 is the date on which the fish becomes one year older. If otoliths or scales have started a new winter zone in the autumn, this zone should not be counted (or measured). In the spring, if otoliths or scales have not yet started the winter zone, this should be assigned a year more than the number of zones, i.e., the edge is counted (and measured) as a winter zone.

Other demersal fish
Count number of opaque zones (summer zones, dark in reflected light) on the otolith.

January 1 is the date on which the fish becomes one year older. Summer zones that grow from the spring shall not be counted before that date. After January 1 they are counted as one year.

1.12.2 Sprat

Otoliths are measured only when special instruction is given. For legibility, follow the general procedure for the V-form.

1.12.3 Whiting, haddock, saithe, cod, Norway pout

Break the otolith in two at the centre with your fingers (half of the nucleus in each part). One half is stuck by it's sharp end into plasticine or another material that is suitable for mounting. Observe the broken plane under the microscope with light coming in from the side horizontally. Use a stick (e.g. pencil) to shadow the surface (the broken plane). The light will be refracted in the otolith towards the objective. The hyaline zones (winter zones, narrow) will be light and the opaque zones (summer zones, wide) will be dark.

Count the number of summer zones to determine the age of the specimen (AGE). In the first year of spawning and the subsequent spawning years, the summer zones will be narrower. The number of these zones should be recorded (SPAWNING ZONES) and the age of fish at first spawning (SPAWNING AGE). For cod one must decide the type of otolith (TYPE). See sub-chapter 1.10.18 (p. 25) for a definition of otolith types. In all other respects, follow the procedure for the V-form and Table 1.9.2 (p. 14).

1.12.4 Blue whiting

The growth zones of the otolith are counted and the diameter is measured (Figure 7, p. 107). The 6X magnification is recommended, i.e calibration about 12. Follow the general procedure for the V-form regarding the legibility.

It is difficult to give strict rules for the determination of zones, the width of rings and zones and the distance between them must be appraised continuously.

In otoliths of young fish (<2 years) it may be difficult to distinguish between the first winter zone and «Bower's zone» («Bailey's zone») and other rings («checks»), particularly for I-group fish caught in the year's first quarter. The results of measurements of the first winter zone cover, on average, 53 measuring units at calibration 12. This may be used as a guide.

In older fish the first zone that is counted is normally distinct and unbroken in cut otoliths. «Bower's zone» and other «checks» on the inside are distinguished from the other zones because they appear thinner and are often broken.

The longest diameter is measured and the inner edge of the rings is used (Figure 7, p. 107).

1.12.5 Capelin

See *«Procedure for age estimation of capelin (Mallotus villosus Müller)»*

Growth zones in the otoliths are counted and radii are measured (Figure 5, p.106). For capelin, 40X magnification is used, i.e., calibration 80-85. A lower magnification is recommended for difficult otoliths.

Distinct otoliths which can be read and measured as they are, are assigned a legibility of 1. Otoliths with false zones are also given legibility of 1 if the false zones can easily be distinguished from the winter zones.

The two following categories of otoliths are assigned a legibility of 2:

1) The age can be decided with relative certainty but the winter rings cannot be measured because the part of the otolith where measurements are made is diffuse, split, etc. Count the age as the number of winter rings but do not measure.

2) Based on experience it is probable that there must be a ring within the first visible one, since it has a suspiciously large radius and the first ring may be hidden because the centre of the otolith is thick and opaque. In this case the age is set to one more than the measurable zones. All visible zones should be measured. The radius of the first ring is written in the column for growth zone no. 2 (V:81-82), the next ring under no. 3, etc. The column for growth zone no. 1 is left open, and radius for the first visible ring is measured to the inner edge.

When the age cannot be determined with acceptable degree of certainty or when the otolith is

missing, a legibility value of 3 is given. It is, however, possible to fill in a "minimum age" in the age column, i.e., the lowest number of rings that one finds reasonable to interpret as winter rings. Example: An otolith with legibility 3 and 03 in the age column represents a fish that is at least 3 years old but diffuse otolith or false rings make it impossible to say how much older it may be. Such otoliths are not measured.

Measurement of radius is done along a line from the centre to the edge at right angle on a line from the centre to the sharp tip of the otolith (Figure 5, p. 106).

The inner ring is measured to its outer edge as the inner edge often is not well defined. If it is settled that this is the extent of the first ring (and to its inner edge if it is defined as the second

ring - see above about invisible first ring). All other rings are measured to inner edge. Always give the measurements in whole numbers of measuring units.

1.12.6 Mackerel

Winter zones are counted. Otoliths are NOT measured. For legibility (V:75), use the following interpretation of the general procedure for the V-form:

Legibility 1. Age determined with high degree of certainty.
2: Age determined with some uncertainty (difficult otolith).
3: Illegible or missing otolith.

This definition has been used since the beginning of 1996.

1.12.7 Polar cod

See *«Procedure for age estimation of polar cod (Boreogadus saida Lepechin)»*

Measure the longest diameter in all winter zones to the inner edge (Figure 7, p. 107). Recommended magnification: 16X. Follow the general procedure for the V-form regarding legibility.

NB. From 01.01.2000, otoliths from polar cod shall only be measured if special instructions are given.

1.12.8 Herring

See *«Prosedure for age estimation of herring (Clupea harengus L.)»*

Otoliths are measured only by special request. Measured like the capelin otolith (Figure 5, p. 106). A magnification of 40X is recommended.

Scales are measured along a line drawn from the centre to the edge (Figure 6, p. 106).

Measured to the inner edge of the zone. Magnification 16X is recommended.

Herring: Legibility is coded as for mackerel.

Follow the general procedure for the V-form regarding legibility.

1.12.9 Argentine

The otolith is measured only on special instruction. Follow the general procedure for the V-form regarding legibility. A magnification of 6.4X is recommended. (See Figure 8, p. 107).

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2. PROCEDURES FOR ANALYSIS OF FISH STOMACHS

2.1 How to do the sampling and fill in the Stomach Analysis Form (W)

2.1.1 Purpose

The purpose of these procedures is to ensure that all sampling of stomach contents will be carried out in a uniform way thereby guaranteeing the value and reliability of the data.

2.1.2 Scope

This chapter deals with: Standard biological sampling, freezing of samples, simplified biological sampling carried out on board the vessel, full biological sampling.

2.1.3 Definitions

2.1.3.1 Prey

Depends on identification of the stomach contents. Prey may be identified by valid name of species or NODC taxonomic code. See special annex for a list of valid names. The degree of identification varies and this is reflected by the name or the code used.

2.1.3.2 Group of prey

An observation which accounts for one line of the W-form is considered a prey group. Prey should be split into groups. These groups should be weighed separately. A prey group comprises a single line in the W-form because there is limited space in the W-form. The same procedure should be carried out if the same prey can be split into groups which may be measured or not. In more detailed handling the prey will be separated by

stages of digestion. Each line must have a name or a code of the prey group.

2.1.3.3 Full sampling of the stomach contents:

Sampling, which attaches importance to identification of the prey. A detailed observation of digestive stages is also included. In some cases sampling of this category may also include weight of each length group. One line of the W-form will correspond to the length group of a prey.

2.1.3.4 Stages of digestion:

A digit code from 1-5 describing how far the digestive process has advanced. See: Procedure of coding, and filling in the form, stomach form (p. 66).

2.1.3.5 Simple sampling of the stomach contents:

A specimen sampling of stomach contents which is usually carried out in connection with a standard biological sampling of fish (during the cruise). Compared to the full sampling procedure, an exact identification of prey is not required and it is unnecessary to fill in the code for digestive stage. See below (2.1.5, p. 39): Categories of prey in connection with simplified sampling of stomach contents.

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2.1.4 Description

2.1.4.1 Prior to specimen sampling

Responsibility	Stage	Activity/Processing
Sampler	1	Prepares the equipment which includes small and large plastic bags, a waterproof marker pen, labels for identifying frozen samples; plastic containers must be moistened the scale to be calibrated with an accuracy of 0.1 g (100 mg) or more accurate; obtains other equipment including sheet for making a draft of the length frequencies, tweezers, scissors, microscope.

2.1.4.2 Sampling

This kind of sampling is meant to be incorporated in the standard biological sampling of fish. The sequence of tasks to be carried out is not important. Steps 1 to 4 represent one sample. Repeat the steps until a sufficient number of samples have been collected. It is assumed that the cavity of the predator is opened in connection with other biological sampling, e.g., sex, maturity stage.

A simplified sampling of stomach contents is usually undertaken in conjunction with standard biological sampling, but may also be taken from a length frequency sample, or in samples where only the length and weight of the predator are recorded. The collection of stomach samples based on other samples than a standard biological sample, should always be approved by the Department of Resources (Demersal Fish Section). They should be taken only if there is a lack of personnel on board and/or no capacity for handling the age material at the Demersal Fish Section.

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Responsibility	Stage	Activity/Processing
Sampler 1	1	The lower part of the plastic bag is marked with fish number.
Sampler 2	2	The whole stomach is cut out as near as possible to the gullet and close to the appendix pylorus. It is important to remove all of the stomach contents. If the stomach is damaged or the contents spilt in any way then scoop up the stomach contents in the best possible way. Be critical. If too much of the stomach contents is lost, the sample should be discarded and replaced by a new one. If the stomach is turned inside out or the predator has vomited, the sample should be rejected and replaced by a new one.
Both	3	Put the stomach with contents in a plastic bag and mark it with fish number.
Sampler 1	4	**Simplified sampling**: Bag with contents is placed on a tray in a box to facilitate transport to the lab for further analysis. **Full sampling**: Tie the bag with a knot. When sampling is completed, all the bags are collected in a larger plastic bag. A station label must be filled in and put in the bag, visible from the outside. There will be one bag for each species and each station. These bags should be collected in a larger bag. The sample is frozen immediately after sampling.

2.1.4.3 Simplified sampling

This kind of analysis is made during the cruise. The chief scientist decides whether to take a full or a simplified sample. Previous to analysing each stomach, the columns 2-40 of the W-form should be filled in. The following sequence describes how to analyse each stomach. The procedure is repeated until one sample is complete. The procedure assumes that there are two samplers. The first is equipped with W-forms, a pencil and some blank sheets, and has access to V-forms or otolith bags. This work can also be executed by one person.

Title	Version:
Procedures for Analysis of Fish Stomachs	1.0

Responsibility	**Stage**	**Activity/Processing**
Sampler 1	1	The number marked on the plastic bag containing the stomach contents is registered in the W-form. If more space is needed than one line per stomach then mark each line with the fish number.
Sampler 2	2	The stomach is opened and the contents are placed in a large, flat container. Use a strainer to get rid of the water.
Both	3	The contents are grouped by species, some for measuring and some for counting (dependent on quality). If there is not enough space for length frequencies on the W-form, a prey group is also split by size. Valid name of the prey is registered in the W-form. If several lines are needed for each prey, mark each line with the NAME or the CODE of the prey. Chapter 2.1.5 (p. 39) describes how to group the prey for different species or predator.
Both	4	When possible the number of prey in a group is counted and registered in the W-form. NB Exact unit for number. When possible length frequency measurements are made. Sampler 1 records the length frequencies. If the number of prey is high, a sub-sample may be taken. The left-overs are counted and everything is weighed. The length frequencies are registered in the W-form. The measurement code is the same as that of the T-form. The codes of interval and minimum length are the same as those of the U-form. Always weigh each prey group separately (i.e., if the prey account for more than one line of the W-form, weight should be registered on each line). Record the weight to the highest degree of precision possible. For example, the most accurate scales on board the vessels have an accuracy of 0.1 g. See Procedure of coding and filling in the form, stomach form, (p. 66).
Sampler 2	5	Prepares for the next stomach, making arrangements for sufficient clean, wet containers. The scale is tared.

2.1.4.4 Full sampling

This type of sampling is usually carried out ashore on frozen samples.

Responsibility	**Stage**	**Activity/Processing**
See Chapter 2.1.4.2	1-3	Like simplified sampling, except that all the prey are sorted to species, if possible.
See Chapter 2.1.4.2	4-5	Like simplified sampling. In addition, the digestive stages of each prey group are coded. In some cases it may be of current interest to split up a prey group by various digestive stages. See: Procedure of coding and filling in the form, stomach form (p. 66). The prey groups are weighed with an accuracy of 0.001 g (mg).

2.1.5 Grouping of prey when sampling

The lists of species indicated, represent the minimum requirements for information. Depending on knowledge and experience, the number of groups may increase but the degree of detail should not substantially reduce the efficiency.

Some of the historical data on stomachs have been analysed in bulk. These data have been converted to W-lines by dividing the total weight of stomach content by the number of fish with stomach content of the actual group, excluding the number of prey species. The data can thus be used as aggregated data, but not as data collected from individual sampling.

2.1.5.1 Predator: **COD**

Prey are expected to be identified and grouped as:

AMPHIPODS
OTHER FISH
HADDOCK
KRILL
CAPELIN
POLAR COD
SHRIMP
HERRING
COD
SCORPION FISH

UNIDENTIFIED FISH
UNKNOWN

The above species are measured to total length by the accuracy of 1 cm, i.e., interval 3**.** The same degree at accuracy is also required for the species **HERRING** and **CAPELIN.** For shrimp length frequencies of the carapax are made. The degree of accuracy for shrimp is 0,5 or 1mm. If parts of the prey are digested, (e.g. end of tail), the original length should be estimated.

The group **UNKNOWN** (taxonomy: 9999, Latin name: **INDETERMINATUS**) contains material which is impossible to identify but are a lower level than fish (i.e., as distinct from **UNKNOWN FISH**). This group may also include species/groups which may be identified but are not included in the list above. The group **OTHER FISH** (taxonomy: 8899, Latin name: **VARIATUS PISCES**) are species/groups of fish which may be identified and not included in the list above. The group **UNKNOWN FISH** (taxonomy: 8735, Latin name: **TELEOSTEI**) is fish material impossible to identify.

2.1.5.2 Predator: **HERRING**

If possible, prey should be identified to species or to the following groups:

AMPHIPODS
COPEPODS
KRILL
CLADOCERA
OTHER CRUSTACEANS
MOLLUSCA
APPENDICULARIA
CHAETOGNATHA
FISH

2.1.5.3 Predator: **CAPELIN**

If possible, prey should be identified and grouped in:

AMPHIPODS
COPEPODS
KRILL
CAPELIN
UNKNOWN

2.1.5.4 Predator: **HADDOCK**

If possible, prey should be identified and grouped in:

NO STANDARD INTRODUCED

2.1.5.5 Predator: **SAITHE**

If possible, prey should be identified and grouped in:

NO STANDARD INTRODUCED

2.1.5.6 Predator: **GREENLAND HALIBUT**

If possible, prey should be identified and grouped in:

NO STANDARD INTRODUCED

2.1.5.7 Predator: **KING CRAB**

If possible, prey should be identified and grouped in:

BIVALVIA (MUSSELS)
GASTROPODA (SNAILS)
POLYCHAETA
ECHINODERMATA
PISCES (FISH REMNANTS)
ALGAE

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3. PROCEDURES FOR CODING AND FILLING IN OF FORMS

3.1 General information

The person completing these forms is responsible for,0 quality control. Make sure to write legibly to make the job easier for the person who subsequently keypunches the data into the database. Remember that there is one digit in each column. Do not make notes upon the part of the form which is used during keypunching.

The S-form has lines for signatures of sampler, data recorder and keypuncher. These lines **must** be filled in.

3.1.1 Types of forms

S	Fishing station form
T	Sampling form
U	Length frequency form
V	Specimen form
W	Stomach analysis form

3.1.2 Observation of quality level

The observation of quality follows the version (1.0) of the procedure for *Kvalitetsmål for innlegging av data i databasen.* Observation of the quality level should be noted on all fishing station forms (S). The observation should be adjusted on the right hand side of the form, from column 130 (p. 43).

FISHING STATION FORM «S»

3.2 Fishing station form (S)

Col	Code	Explanation	Value
1	TYPE OF FORM	Letter indicating type of data, S for fishing station form. NOT TO BE CODED.	
2-4	YEAR	The year written with 3 digits, e.g. 995.	
5-6	NATION	Name of the nation to which the vessels belongs, e.g., Norway = 58 (see Chap. 5 Table 1, p. 75).	
7	VESSEL CODE	Code system used	
		Not observed, (unknown vessel)	blank
		Commercial fishing vessel known or unknown (VESSEL, to be coded by ITU calling signal)	1
		Vessel, commercial or hired, which at the time of sampling is NOT being used for commercial purposes (VESSEL, to be coded by ITU calling signal)	3
		Research vessel, known or unknown (VESSEL to be coded with IOC/NODC vessel codes)	4
		Unknown hired vessel or hired research vessel or research vessel without an IOC/NODC code. (VESSEL to be coded by ITU calling signal)	6
		Offshore fishing vessel (VESSEL to be coded by special codes)	7
8-13	VESSEL	Code for vessel depends on VESSEL CODE	
		Not registered (Unknown vessel)	blank

See sub-chapter 5.1.2.1 (p. 76) and 5.1.2.2 (p. 77) for ITU, IOC/NODC and special codes.

14-15 MONTH — Month

16-17 DAY — Day

18-21 STN NO — Station number

22-26 SERIAL NO — The serial number for each fishing station according to instructions for each section at the IMR

Common	00001-19999
Pelagic fish section	20000-20999
Pelagic fish section	22000-49999
Research station Flødevigen	21000-21999
Demersal fish section	60000-64999
Demersal fish section	70000-99999
Coast guard	50000-51999
Fisheries Research Tromsø	65000-65999
Fish capture division	67000-69999

27 STN TYPE — Indicates type of station

Ordinary fishing station	blank
Fishing station within a closed area To specify closing of a fishing area (e.g., for protection of certain species or size groups see (T:79).	A
Fishing station taken for a specific purpose, where catch is not representative.	C
Part of a 24 hr station	1
Gear experiment station	2
Gear experiment station and an ordinary fishing station	3
Part of multi-bag trawl station where the bags are used at different times or varying depths The fishing station is within a region closed for fishing, by the Authorities.	4
Part of multi-bag trawl station where the bags are used simultaneously or at varying depths Main bag	5

		Port side bag	6
		Central bag	7
		Starboard bag	8
		Closed fishing region	A
28-32	LATITUDE	Latitudinal position in degrees (S:28-29), minutes (S:30-31) and decimal of minute (S:32), when gear reaches fishing depth. Use GPS data if possible 0°, 0', and 1 decimal of minute to be key punched	
33-38	LONGITUDE	Longitudinal position in degrees (S:33-35), minutes (S:36-37) and decimal of minute (S:38), when gear reaches fishing depth. Use GPS data if possible. 0°, 0', and 1 decimal of minute to be punched.	
39	QUDRANT	Denotes quadrant	
		North and east	0
		North and west	1
		South and east	2
		South and west	3
		A station with position on the border between two or more areas/ locations, must be placed in the area/ location south/ west of the given position.	
40	SYSTEM	System for geographical region (See MAPS in chapter 5.)	
		Release of cod in Hordaland	1
		Statistical region and location	2
		ICES squares (North Sea) surveys	3
		Strata code, demersal surveys in the Barents Sea	4
		Strata code, demersal surveys in the Spitzbergen area	5
		Strata code, shrimp surveys in the Barents Sea	6
		Strata code, shrimp surveys in the Spitzbergen area	7
		Shrimps in Skagerrak	8
		0-group investigations in the Barents Sea	9
41-42	REGION	Geographical region	
43-45	LOCATION	Location	
46-49	BOTTOM DEPTH	Average bottom depth at the catch location, in metres.	

		Catch location is determined from where the gear reached the fishing depth until it left that depth. Average bottom depth is therefore filled in after the gear left fishing depth.	
		Unknown depth	blank
50-51	NO. OF GEARS	Number of gears	
		Unknown number	blank
		Number	1-99
		For longline/gillnet. Number >99 use column 56-57 (GEAR NO.)	
52-55	GEAR	Indicates which type of gear is used See Chap. 5- Table 3 (p. 78).	
56-57	GEAR NO.	Specifies gear type used. See marked plate attached for the identification number of each gear (applies for the time being to trawl gear.)	
		For longline/gillnet: (see column 50-51)	
		Total number of gear	blank
		Number in 10	1
		Number in 100	2
		Number in 1000	3
58-59	DIRECTION	Indicates sailing direction during haul. Resolution of 10 degrees, min. 0 - max 36. (rounded down e.g., 258 = 25, 252 =25). To be filled in only when the haul is carried out in one direction. North to be coded as 36.	
60-61	SPEED	Speed during trawling indicated in tenths of a knot Trawling speed should primarily be measured by SCANMAR speed meter fixed to the gear. If not use data from GPS.	
62-65	START TIME	Hour and minute when gear reaches fishing depth. (UTC = Universal Time Code = GMT)	
66-69	START LOG	Read from log when gear reached fishing depth. Indicated in tenths of a nautical mile.	

70-73	STOP TIME	Time (UTC) when gear leaves fishing depth. Indicated in hours and minutes.	
74-76	DISTANCE	Trawled distance in tenths of a nautical mile. Use data from GPS if possible. When demersal trawl is used to measure fish stocks quantitatively, a specified distance has to be trawled over the bottom as measured by GPS. Towing time, speed, and distance must be registered independently. This procedure should also be used for qualitative hauls. There are no such standards for pelagic trawling.	
77	CONDITION	Condition of the gear after the haul is finished.	
		Not observed	blank
		Gear in perfect order	1
		Gear has minor damages, nothing of consequence to selection and catch. (The trawl has minor damages in the front part).	2
		Gear is damaged. Some fish may have escaped the codend.	3
		Trawl has long gashes, or large pieces of net are missing, codend intact.	4
		Codend torn, very little catch.	5
		Gear completely destroyed.	6
		Gear lost.	7
78	QUALITY	Indicates to what degree the catch represents the quantity of fish in the area, judged according to the manner in which the gear was used and the behaviour of the gear.	
		Not observed	blank
		The trawl has been set at a predetermined position, the trawl sensors show that all is OK.	1
		The trawl has been aimed at an	2

		acoustic registration or other information on fish. If trawl sensors are being used, these show that all is OK.	
		The trawl has been set at a predetermined position, trawl sensors show problems with bottom contact, faulty door distance, or other indications of malfunction.	3
		The trawl has been aimed at an acoustic registration, trawl sensors show problems with the trawl.	4
		The trawl has not been fishing properly due to technical problems.	5
		The catch is not representative due to large quantities of corals or clay.	6
79-82	FISHING DEPTH MAX	The maximum depth where the gear was operated, given in metres. If the gear was used at one depth only, it should be put here.	
		For trawl: The maximum depth of the upper trawl beam, after the trawl has reached the desired fishing depth. If the trawl has passed through several fishing depths according to a standard procedure, use a code for e.g. 0-group surveys.	
		Trawling at the surface	9001
		Trawling at 0 and 20 m depth	9002
		Trawling at 0, 20 and 40 m	9003
		Trawling at 0, 20, 40 and 60 m	9004
		Trawling at 0, 20, 40, 60 and 80 m	9005
		Trawling at 20 m	9006
		Trawling at 20 and 40 m	9007
		Trawling at 20, 40 and 60 m	9008
		Trawling at 40 m	9009
		Trawling at 40 and 60 m	9010
		Trawling at 60 m	9011
		Trawling at 60 and 80 m	9012
		Trawling at 80 m	9013
		Trawling at 0 and 30 m	9014
		Trawling at 0, 10, 20, 30, 40 and 50 m	9015

		Other types of trawling during 0-group surveys should be coded with max. and min. depths. For other types of gear than trawl: This square indicates the maximum depth, where fishing took place.
83-86	FISHING DEPTH MIN	The minimum depth where the gear has been operating, given in metres. Must not be filled in if fishing has taken place at one depth only. For trawl: The minimum depth of the upper trawl beam, in the main depth, given in metres. For other types of gear: This square indicates the minimum depth where fishing took place.
87-89	OPN	The opening of the trawl at the main depth, with 10 cm (0.1 m) accuracy.
90-91	ST DEV OPN	The standard deviation of the opening, with one decimal. Obtained from the computer connected to the SCANMAR.
92-94	DOOR DIST	Distance between trawl doors, in metres.
95-97	ST DEV DOOR DIST	The standard deviation of the door distance Obtained from the computer connected to the SCANMAR.
98-99	SPECIAL CODE	Used during the «so-called Cod adventure» surveys 1989-1993. FISH ABUNDANCE: (S:98-98), see Fig. 9 (p. 108) FISH DISTRIBUTION: (S:99-99), see Fig. 10 (p. 108) Special codes are used to indicate the number of days the gear is in the water, e.g., in bow-net fishery for king crab.
100-03	WIRE LENGTH	Representative wire length at the fishing station.
122	QUALITY	Appraisal of Quality level of the fish data.

	LEVEL			
		Classification Quality level	1	1
		Classification Quality level	2	2
		Classification Quality level	3	3
123-24	RELEVANT QUALITY PROCEDURE	The actual version of the procedure for quality coding,concerning:		
		Quality measures for entering data into the data base, version 1.0		10
125-26	RE-CODING PROGRAMME	The vesion of the data programme for re-coding data.		
		BiofoxSTUV		40
		SPD30 (SPD version 3.0 year: 1994)		30
		SPD20 (SPD version 2.0 year:1990-1993)		20
		SPD11 (SPD version 1.1 year 1989)		11
		CONVERT version 2		02
127-28	ORIGINAL FORMAT,	The original format of the data. Which instructions manual etc, were used to register the data. The data have later been re-coded to fit the SPD version in force.		
		The data have been entered using the SPD version in force		blank
		Biofox		40
		SPD version 3.0		30
		SPD version 2.0		20
		SPD version 1.1		11
		AB version 01		01
129-30	ACTUAL FORMAT	Existing format of the data. Which instructions, manual etc have been used for the data in question.		
		SPD version 3.1 (from 2000 onwards)		31

SAMPLING FORM «T»

3.3 Sampling form «T»

Col.	Code	Explanation	Value
1-26		See Fishing station form «S» (p. 43).	
27	SPECIES CODE	How species/stock is identified.. See Table 4 (p. 84) or 5.1.4.1 (p. 93) for options.	
		Taxonomic code	1
		Norwegian name	2
		Scientific name («Latin name»)	3
		English name	4
		Russian name	5
28-39	SPECIES	Name is given by max 12 letters or numerals. See Table 4 (p. 84) for international 12-digit identification code for species or lower taxonomic level and name. Free space may be used for for further specification (e.g. sub-species) but should be separated from species name/ numeral code by an apostrophe (‘).	
40	LOT SAMPLE	When more than one sample of a species is taken at a station, each sample is given a number. See explanation under Chapter 1.5 (p. 8), how to take more than one sample of a species at one station. For king crab, see Chapter 1.6 (p. 9).	
41-42	SAMPLE TYPE	How sampling is carried out and what type of sample it is. Samples are divided into three main types. Explanation of sampling procedures is given in Chapter 1.7 (p. 10).	
		Length measurements:	10-19
		Representative length or diameter measurement.	10
		Length and biological sampling:	20-29
		Representative length and biological sampling.	20

		Representative length frequency sampling. Biological sampling representative only within each length interval (length stratified).	21
		Representative length frequency sampling. Biological sampling representative only within each length interval (length stratified), 24 hr station.	22
		Other sample types (including sample types used in previous years):	30-49
		Age and head length	30
		Age and length without head	31
		Age without length (Age only)	32
		Grouped in length intervals according to minimum legal length or other grouping	33
		Length and weight of single specimens	34
		Sample (part-sample) already analysed (e.g. fish length measured fresh, then frozen and later sampled more thoroughly. Sampling form for the frozen fish is coded 35).	35
43-44	GROUP	Code tells that sample of this species is taken from a selected part of the catch e.g., during 0-group surveys, to separate 0- and I-group fish from the rest of the catch or when shrimp samples are divided by sex in the «T» form.	
		Sample is taken from selected age group(s).	10-19
		0-group (before 31 December in year of birth)	10
		I-group (the following calendar year)	11
		II-group	12
		All year-classes mixed (0+)	13
		I-group and older (I+)	14
		II-group and older (II+)	15
		III-group and older (III+)	16
		Sample taken from discarded catch or by-catch, commercial catch or catch by hired vessel.	20-29
		From total catch	20
		over minimum legal length	21
		under minimum legal length	22

From discarded catch	23
over minimum legal length	24
under minimum legal length	25
From landings at food factories	26
over minimum legal length	27
under minimum legal length	28
Sample from selection experiments.	30-31
From codend	30
From cover net	31
Sample taken by authorities from the Fishery Ministry in connection with closing/opening of fishing grounds.	40
Sample from commercial fishing vessel taken by authorities from the Fishery Ministry.	41
Sample is not representative.	49
Sample taken for special (unspecified) purpose.	50
Sample taken by Coast Guard from commercial fishing vessel.	51
Sample taken by fishermen on board commercial fishing vessel.	52
List of Coast Guard vessels with codes	
«Grimsholm»	53
«Heimdal»	54
«Nornen»	55
«Volstad»	56
«Farm»	57
«Lafjord»	58
«Nordsjøbas»	59
«Andenes»	60
«Senja»	61
«Stålbas»	62
«Gapeskjær»	63
«Nordkapp»	64
«Kim»	65
«Lance»	66
«Ålesund»	67
«Tromsø»	68

			«Nysleppen»	69
			«Thorsteinson»	70
			«Ice Lady»	71
			«Sture-Gøran»	72
			«Polarvakt»	73
			«Barentshav»	74
			«Malene Østervold»	75
			«Eigun»	76
			«Sjøveien»	77
			«Svalbard»	78
			Special codes	80-99
45	CONSERVATION	Conservation method.		
			Fresh	1
			Frozen	2
			Formaldehyde	3
			Alcohol	4
			Other methods	5
46	MEASUREMENT	What is measured:		
			Not measured	blank
			Round weight in kg	1
			Volume in litres	2
			Gutted without head in kg	3
			Gutted with head in kg	4
			Round weight in tonnes	5
			Round weight in tonnes, number in 1000	6
			Gutted without head in tonnes	7
			Gutted with head in tonnes	8
			Round weight in g	9
		For conversion of catch from hectolitres to kg, see «Conversion factors for product weight to round weight» (p. 2).		
47-53	CATCH WEIGHT/VOL	Total catch of species represented by this sample.		
54-59	CATCH NO	Number of fish in catch represented by this sample. In thousands if MEASUREMENT (T:46) has code 6.		
60	MEASUREMENT	What is measured. See description of (T:46) above.		

61 LENGTH MEASUREMENT — Method of measurement. In fish, length is measured; in jellyfish, diameter; in crustaceans carapax length, etc. See Fig.1,2 (p. 103,104).

Not observed	blank
Diametre	A
Mantle length	B
Carapax length[2]	C
Head length	D
From snout to	
end of tail when in natural position	E
end of tail with lobes squeezed together	F
anterior edge of anal fin	G
posterior edge of dorsal fin	H
notch in tail (fork length)	I
«bone knob» at tail root (standard length)	J
Length without head	K
Carapax width [5]	L
Width of right claw	M
Length of right claw	N
Length of third foot's meros (thigh)	O
Width of third foot's meros (thigh)	P
Japanese cut	R

62-67 LENGTH SAMPLE WEIGHT/VOLUME — Weight/volume of length sample.

68-71 LENGTH SAMPLE NUMBER — Number of fish in sample.

72-75 SPECIMEN SAMPLE, NUMBER — Number of fish in sample.

76 OTOLITH/SCALE — Specifies what is used for age determination.

Age not determined	blank
Scale	1
Otolith	2
Scale + otolith (mixed)	3

[2] Carapax: Headshield on crustacean3

		Fin spine	4
		Fin spine + otolith (mixed)	5
77	PARASITE	Indicates whether fish is checked for parasites or whether parasites are found.	
		Not checked	blank
		Sampling carried out, but no parasites found	1
		Parasites found	
78	STOMACH	Sampling of stomach filling/contents.	
		Not checked	blank
		Simplified stomach sample, wet weight	1
		Fully worked sample, wet weight (e.g., when sample is frozen and worked up ashore)	2
		Fully worked sample, dry weight, frozen material (e.g., pelagic fish worked up ashore)	3
		Fully worked sample, dry weight, preserved in formaldehyde.	4
		Bulk data split on single fish - wet weight	5
		Bulk data split on single fish - dry weight	6
79	GENETICS	Indicates whether samples for genetic studies are collected.	
		No sampling	blank
		Samples collected	1
		Target	2
		Target+genetics	3
		Closing of a fishing area (e.g., for protection of certain species or size groups). Use of this code, also requires use of code A (S:27). This code is only to be used by the Directorate of fisheries. Valid from 01.01.2003.	
		Opened	blank
		Closed	4

3.4 Length frequency form «U»

The length frequency distribution form (the U-form) is normally not filled in during sampling but afterwards it is coded from notes made in the sampling laboratory.

Splitting the sample over several lines may be necessary for various reasons:

> The sample is sex-specific, therefore, one line is needed for each sex and it may be desirable to have a third line for the total.
>
> For shrimp there are special rules, see next page.
>
> There may be more than 37 length intervals. If this is the case, two or more lines are needed. Interval, sex and lowest length must be filled in for each line. In columns (U:43-45) start length for the present line is filled in.
>
> There may be more than 99 fish in each length group. Then up to 99 fish are placed on the first line and the remaining specimens on the next line(s).

If an interval has less than 10 specimens, use only one numeral (1, 2, etc., not 01, 02, etc.) in the space to the right. Intervals having no specimens should be left blank.

Column	Code	Explanation	Value
1-40		See Fishing station form «S» (p. 43) and Sampling form «T» (p. 51).	
41	INTERVAL	Length groups:	
		1 mm	1
		5 mm	2
		1 cm	3
		3 cm	4
		5 cm	5
		0.5 mm	6
		0.1 mm	7
42	SEX	Not checked (mixed)	blank
		Female	1
		Male	2
		For shrimp:	
		Not checked	blank

Male	A
Intersex HR (head roe)	B
Intersex UR (without roe)	C
Female BR+Ø (roe with eyes)	D
Female BR-Ø (roe without eyes)	E
Female HR	F
Female JH (this year's spawning finished)	G
Female UR	H
Female J/HR	I
Female BR+Ø/HR	K
Female BR+Ø/JH	L
Female BR+Ø/JH+HR	M
Female BR-Ø/HR	N

43-45	LOWER LENGTH GROUP	Lower limit of first length interval on this line, without decimals. For interval 0.5 mm and 0.1 mm the lower limit is given in tenths of mm. For intervals 1, 3, and 5 cm the lower limit is in cm.
46-119	LENGTH FREQUENCIES IN NUMBERS	Number of specimens in each interval. Number of specimens in first interval is recorded in column (U:46-47), the next in 48-49, etc.

SPECIMEN FORM
«V»

3.5 Specimen form (V)

See Chapter 1 Sampling of fish and invertebrates regarding how to take a sample and which codes and measurements have to be used for the various species. Tables 1.9.1. (p. 13), 1.9.2. (p. 14) and 1.9.3. (p. 15) provides a helpful summary of the variables to be measured.

Below is an explanation of the various parameters and the appropriate which codes to use (Consult Chapter 1 to determine if a species should be measured by weight or volume). Code 1 = weight and code 2 = volume.

The initials of the persons responsible for the actual sample should be recorded in the top right corner of the sample form. Also note the person responsible for age reading of the sample.

Col.	Code	Explanation	Value
1-40		See Fishing station form «S» (p. 43) and Sampling form «T» (p. 51).	
41-43	FISH NO.	The specimens are to be listed in numerical order.	
44	WEIGHT/ VOLUME	Used to code column (V:45-49) for weight or volume. Filled square (V:119-123) is given as code 4.	
		Weight or volume not registered	blank
		Round weight	1
		Volume	2
		Gutted, headless	3
		Gutted, with head	4
		Gutted weight (Japanese cut)	5
		The term *Japanese cut* applies to Greenland halibut, golden and deep water redfish	
45-49	WEIGHT VOLUME	As a general rule, weight or volume are to be measured as exactly as the equipment permits.	

Weight to be stated in whole grams
Volume to be stated in whole ml

From Jan 1 1990 weight and volume should be rounded off to the nearest gram or ml

50 LENGTH UNIT/ length interval — Indicates which interval is used when easuring length.

Length intervals:

1 mm	1
5 mm	2
1 cm	3
3 cm	4
5 cm	5
0.5 mm	6
0.5 mm	7

51-53 LENGTH — Fish: length; jellyfish: diameter; crustacea: carapax length
See Chapter 5, Figs 1, 2 (p. 104).
Length must always be rounded off downwards to the length interval limit. The number must be stated without decimals. For the interval 0.5 mm and 0.1 mm, set the number in tenths of mm. For the intervals 1 and 5 mm set the number in mm. For intervals 1, 3 and 5 cm set the number in cm.

EXAMPLE:

The real length of a fish is 31.7 cm
If using the 5 mm interval enter code 2 in column (V:50) and 315 in column (V:51-53).
If using the 1 cm interval enter code 3 in column (V:50) and 031 in col. (V:51-53).

54 FAT

Not checked	blank
No fat along intestine	1
Narrow band of fat along intestine	2
Some fat along intestine	3
Lots of fat, covering intestine	4

55 SEX

Not checked	blank
Female	1
Male	2

56	STAGES	Maturation according to the general scale of maturity stages, Table 5 (p. 94). See also SPECIAL STAGES for some species in Chapter 5, Table 6-10 (pp. 95-100).	
		Not checked	blank
		Immature	1
		Maturing	2
		Spawning	3
		Postspawning/resting	4
		Uncertain (concerning stages 1 and 4)	5
57-58	SPECIAL STAGES	This refers to maturation defined using species-dependent criteria. (e.g., «Forberg stages» for capelin) See Chapter 1.10. (p. 16) for usage. One digit special codes to be put in col. (V:58)	
59	STOMACH CONTENT	Not checked	blank
		Empty Stomach empty except for water	1
		Very little content So little content that the stomach has to be opened to distinguish stages 1 and 2	2
		Some content Content visible on outside of stomach	3
		Full Stomach full, but not bloated/dilated	4
		Bloated/dilated The stomach is visibly expanded and tight. Content can be observed from the outside	5
		Turned inside out	6
60	DIGESTIVE STAGES	Not checked	blank
		Digestion not started Stomach content seems fresh	1
		Digestion started Various species of prey can still be identified	2

		Digestion advanced The species can no longer be identified, but systematic groups can be separated.	3
		Digestion very advanced Eyes and larger parts of the prey can still be observed in the stomach content	4
		Digestion almost completed Stomach content is porridge-like/dissolved	5
61	LIVER	Not checked	blank
		Thin and negligible, 2-4 mm thick	1
		Clearly visible, but thin, filling about 1/4 of the cavity.	2
		Thicker and lobed, filling about ½ of the cavity.	3
		Swollen, falls out when fish is cut open filling about 3/4 or more of the cavity.	4
62	PARASITE	Not checked	blank
		No visible parasites	1
		From 1 to a few parasites	2
		About ½ of the liver covered	3
		About 3/4 of the liver covered	4
		Liver completely covered	5
63-66	SPECIAL CODE	At present used for: Blue whiting: Gill tumour. See Chapter 1.10.6 (p. 17). Herring: Coastal rings, oceanic rings and fungus infection (*Ichthyophonus*).See chapter 1.10.15 (page 28). Sprat: Coastal rings and fungus infection. See Chap.1.10.3 (p. 16). Cod: Black spot discase/gill maggots. See Chap. 1.10.18 (p. 25) King crab: Length. See Chap. 1.10.7 (p. 17).	
67-68	VERTEBRAE	The vertebrae should be counted as shown in Fig. 4 (p. 106).	
69-70	AGE	See Chapter 1.12. (p. 29) how to read and measure otoliths and scales of the various species.	

71-72	SPAWNING AGE	The age of the fish when spawning for the first time.	
73-74	SPAWNING ZONES	Number of spawning zones.	
75	LEGIBILITY	The Quality of the otolith (scale). See Chap.. 1.12 (p. 29) about how to read, measure and determine the legibility for otoliths/scales of the various species.	
		Not registered	blank
		Zones may be counted and measured with certainty	1
		Zones may be counted, but not measured (difficult)	2
		Zones may not be counted (illegible) or otolith/scale is missing	3
		Age can be determined but spawning zones/age are illegible.	4
		Lowest age of two consecutive years	5
		Highest age of two consecutive years	6
76	TYPE	Classification of scale/otolith. Various ways of determination are being used. See Chap. 1.10 (p. 16)	
77	EDGE	Scales:	
		Not registered	blank
		No additional growth	1
		Additional growth	2
		Otoliths	
		Not registered	blank
		Narrow opaque	1
		Wide opaque	2
		Narrow hyaline	3
		Wide hyaline	4
78	CORE/NUCLEUS	Not determined	blank
		Hyaline (dark in reflected light)	1
		Opaque (white in direct light)	2
79-80	CALIBRATION	To be filled in only if scales or otoliths are being measured. The calibration is done the following way: Set the microscope to the magnification required for the measurement. Place a ruler under the micro-scope and count how many degrees on the	

measuring scale it takes to cover 2 mm. For control, repeat the operation on two other spots on the ruler. If these results show discrepancy, use an average value (or find a better ruler). Note the final result in column (V:79-80). See sub-chapter 1.12 (p. 29) on reading and measuring otoliths and scales, about the recommended magnification for each species.

81-100 GROWTH ZONES Measuring growth of otoliths/scales.

Measurements must be stated in whole degrees. If the number of degrees for one or more growth zones exceeds 99 for the chosen calibration, note only the last two digits of the measurement.

See sub-chapter 1.12 (p. 29) about reading and measuring otoliths and scales, for what to measure and how.

101 TYPE OF TAG Description of the type of tag used.

No control of internal tag	blank
Not tagged (controlled)	A
Floy tag	B
T-tag	C
Oxytetracycline (OTC-tag)	D
2xOTC	E
Alizarin	F
Genetically tagged	G
Floy + Genetically	H
T-tag + Genetically	I
OTC + Genetically	J
Alizarin + Genetically	K
Data Storage Tag	L
Lea	N
Herring	O
Eye	P
Carlin	Q
Snout	R
Adipose fin cut	S
Fin cut	T
Freeze tagged	U
Tattoo	V
Escaped farm fish	W
Crab leg tag	X

		Micro tag	Y
		Data Storage Tag + Lea	Z
102-03	SERIAL CODE	Letter indicating which series the tag number belongs to.	
104-09	TAG NO	When an individual specimen sample is taken from a recovery catch, the tag number must be put here.	
110	WEIGHT/ VOLUME	Used for coding weight or volume respectively in col. (V:111-114) and col. (V:115:118).	
		Not registered weight or volume	blank
		Weight in g,	1
		Volume	2
		Weight in 1/10 g,	3
111-14	GONAD QUANTITY	Weight or volume of gonad. Weight in g, or 1/10 g, volume in ml.	
115-18	LIVER QUANTITY	Weight or volume of liver. Weight in g, or 1/10 g, volume in ml.	
119-23	GUTTED WEIGHT/VOL	Gutted, with head, stated in g See (V:44).	

STOMACH ANALYSIS FORM «W»

3.6 Stomach analysis form (W)

See Chap. 2 Procedure for analysis of fish stomachs (p. 34) about how to take a sample and which codes and measurements should be used for the various species.

In the top right corner of the sample form the initials of the persons responsible for the actual sample should be recorded.

Col.	Code	Explanation	Value
1-43		See Individual specimen form (V) (p. 59) The square FISH NUMBER (W:43) must always be filled in once more if several lines are needed for each fish.	
44	PREY CODE	Code for identification of species/stock See Table 5.1.4 (p. 84) or 5.1.4.1 (p. 93) for possible options.	
		Taxonomic code	1
		Norwegian name	2
		Scientific name	3
		English name	4
		Russian name	5
45-56	PREY	Legal NODC names of species or taxonomique identification of prey. The value is blank if stomach is empty Important: See (W:64-69), weight of prey. Prey species name must be repeated if more lines are needed for one species. For shrimp see (p. 39).	blank
57	DIGESTIVE STAGES	Degree of digestion for various categories of prey.	
		Weight or volume not registered	blank
		Undigested	1
		Digestion started, species easy to identify	2
		Advanced digestion, species or groups may be identified	3

		Digestion almost complete, only remnants of main groups of prey can be identified.	4
		Complete decomposition (porridge), cannot be identified or counted	5
58	UNIT FOR NO	Concerns the total number (W:59:62),does not apply to length/stage distribution.	
		Not registered	blank
		Number in single individuals	1
		Number in hundreds	2
		Number in thousands	3
59-62	NO	An estimate as exact as possible of the number of prey contained in this stomach.	
		Impossible to count (porridge)	blank
		Number	1-9999
63	UNIT FOR WEIGHT	Not registered	blank
		The weight is stated in:	
		kg	1
		g	2
		mg	3
		µg	4
64-69	WEIGHT OF PREY	Micro weight of prey category. See (W:63).	
		Not determined	blank
		Value set to 0 when stomach is empty	0
70	INTERVAL/ STAGE OF DEVELOPMENT	Size of length group/stage of development * Used only for historical material.	
		1 mm	1
		5 mm	2
		1 cm	3
		* 3 cm	4
		* 5 cm	5
		0.5 mm	6
		* 0.1 mm	P
		* 2 mm	Q
		* 3 mm	R
		* 2 cm	S
		* 10 cm	T
		* 20 cm	U

		Eggs(fish, copepods etc.)	E
		Larvae (fish etc.)	L
		Naples (krill, copepods, cirripedes etc.)	N
		Copepodits (copepods)	C
		Furcilia (krill)	F
		Calyptopis (krill)	A
		Cypris (cirripedes)	B
		Zoea	D
		Megalopa	M

71 LENGTH MEASUREMENT — How to measure the length/diameter. See (T:61).

72-74 LOWER LENGTH GROUP — Lower limit for the first length interval/copepodit stage on this line. To be stated without decimals.
For intervals 0.1 and 0.5 mm set lower limit in 1/10 mm, for interval 1,2,3 and 5 mm set lower limit in mm. For 1,2,3,5,10 and 20 cm set lower limit in cm. For development stages E,L,N,F,A,B,D and M this square should be left empty (blank).

The following copepodite stage should be used.

C I (copepodite stage 1)	1
C II (- " - 2)	2
CIII (- " - 3)	3
CIV (- " - 4)	4
C V (- " - 5)	5
CVI (adults, sex not determined)	6
CVI females	7
CVI males	8
CI-CIII (copepodite stages 1-3)	9
CIV-CVI (copepodite stages 4-6, where 6 indicates adult copepods	10

75-118 LENGTH-FREQUENCY IN NUMBER — Number of organisms at each length interval/development stage. The number in the first interval to be put in column (W:75-76). Important: the measured number, not to be multiplied.

There is only space for 22 length groups in the form. This is insufficient if there is great variation in the length of the prey in the same stomach. This can be solved by splitting each prey category into groups of corresponding length. (That is, groups that may be covered by one line in the W-form). When using this method of division, one should remember to weigh each part separately.

Title: **Procedures for sampling of genetic material**			
Author(s): Ole Ingar Paulsen		Approved by: Knut Eirik Jørstad	Date: October 19 1994
		Published by or rights held by (center, section or project): Department of Aquaculture	
Version: 1.0	Date: October 11 1994	Ansvarlig for vedlikehold/revisjoner/tilgjengelighet: Laboratory supervisor	
File format (WordPerfect, Word for Windows, Framemaker, Publisher etc.): Word 6.0a File name: redigerx.dok			

4. PROCEDURES FOR SAMPLING OF GENETIC MATERIAL

4.1 Objective

These procedures ensures that all samples collected for genetic analyses are treated consistently.

4.2 Contents

These procedures describe the collection of samples for electrophoresis and other types of genetic analyses as well as appropriate methods for storage of the samples. Procedures for biological sample collection are not described.

4.3 Background

Genetic samples are analysed by various methods. The results may be used to describe population genetics of fish. Biopsies of live fish can be used for, among other things, identification of fish with a defined set of genetic characteristics sentence non sensical as is.

4.4 Critical factors

It is important that the sampled material be as fresh as possible. Samples from crustaceans and shellfish should be taken from live specimens. Biopsy samples from live fish or shellfish should consist of a piece of muscle tissue at least 0.8 cm thick. Use ice to keep the sample as cold as possible during transport. Unless the laboratory analysis is undertaken immediately, the samples must be frozen as soon as possible.

Title:	Version:
Procedures for sampling of genetic material	1.0

4.5 Description

Part no.: 1 Dead fish, crustaceans and shellfish.

Responsibility	Step	Activity
Sampler	1	Have sampling equipment available. Label containers with date, location, station number, etc.
Sampler	2	Take genetic sample (e.g., muscle tissue) along with other required biological information.
Sampler	3	Add distilled water or fixative to tissue sample and freeze.
Sampler	4	Transport frozen samples to the laboratory.

Part no.: 2 Live fish and shellfish.

Responsibility	Step	Activity
Sampler	1	Prepare a tank with running seawater, aeration and drainage systems.
Sampler	2	Prepare a smaller tank with seawater and anaesthetic.
Sampler	3	Prepare equipment for sampling (biopsy apparatus). Start with three fish in anaesthetic tank and then increase density to 10-15 fish depending on size.
Sampler	4	Take biopsy sample. Samples must be kept on ice throughout sample collection.
Sampler	5	Add distilled water or fixative and freeze. Transport the frozen samples to the laboratory.

Title: **Procedures for sampling of genetic material**	Version: 1.0

Part no.3: Sampling for DNA analysis.

Responsibility	Step	Activity
Sampler	1	Have eppendorf or microfuge tubes available before sampling. Label sample bags for the tubes with date, location and station number.
Sampler	2	Take genetic sample along with other required biological information.
Sampler	3	Freeze sample or add 96% ethanol.
Sampler	4	Transport frozen samples to the laboratory.

4.6 Quality control

Old or dried-out samples should be discarded.

4.7 Environmental safety

Care should be taken when handling the scalpel.

4.8 References

O.I. Paulsen. 1994. Enzymelektroforese prosedyrer, Gene laboratory., Center for aquaculture.

4.9 Annexes

O.I. Paulsen. 1994. Prøvetaking til enzymelektroforese.

G. Dahle. 1994. Prøvetaking til DNA analyser.

4.9.1 Sampling for enzyme electrophoresis and DNA analysis

4.9.1.1 Equipment for fish and shellfish

- Microtest plates with 96 wells each having a volume of 0.2 ml, e.g., Nunc MicroWell 2-62170 96U.
- covers to Microtest plates, e.g., Nunc MicroWell 1-67008 96F.
- one scalpel handle and scalpel blades, e.g., number 21 - 23.
- tweezers.
- distilled water/fixative
- Pasteur pipettes with vacuum tube
- Ice or dry ice in a cooler
- Freezer

Additional equipment for shellfish:

- pliers
- marked small plastic bags with ziplock.

4.9.1.2 Equipment for biopsies of live fish and shellfish

- Microtest plates with covers as described above, no. In section 9.9.1.1 or 9.9.1.3
- tweezers
- Biopsy apparatus consisting of: Electromotor of 7.2 V direct currency with on/off button, and a cable for connection to a battery eliminator. An adaptor for a steel syringe is fitted to the motor axle. The motor should have a plastic cover.

Syringes:

- The syringe must be cut sharply in a 90° angle, and polished obliquely inside and outside.
- The syringe is approx. 50 mm long and 1.2 mm thick
- Cylindrical piston approx. 80 mm long and 1.19 mm thick
- Spray box containing 5-56

4.9.1.3 Equipment for DNA samples

- Eppendorf or microfuge tubes with caps
- scalpel with blades
- tweezers
- plastic bags (medium size)
- ethanol (optional)

4.9.1.4 Sampling of white muscle tissue

Cut out a piece of tissue from the area behind the head where the flesh is thickest. Use the tweezers to place the muscle tissue in the first well of the microtest plate. Ideally, the final

volume in each well should be between 25 and 75% of the total volume of the well. It is important that the sampling for enzyme electrophoresis is conducted simultaneously with the biological sampling.

When sampling the heart, liver or eye the volume of the sample should be approximately 25-40% of the total volume in the well. When sampling from the eye it is important to get a part of the lense. If sampling over an extended period of time or at high temperatures, the microtest plate should be set on ice.

When the microtest plate is full, add 1-3 drops of distilled water depending on the volume of the sample. Write the sample identification information on the cover of the plate. Place the cover over the plate and secure with a rubber band. The covered microtest plate should be placed in the freezer immediately.

Sampling of crustaceans is done by pinching off a leg using the pliers. The leg should be placed in a marked plastic bag and frozen.

4.9.1.5 Biopsies of living fish and shellfish.

Fish should be anaesthetised by use of Metomedate (which can be obtained from the Fish Disease Lab, IMR). Dosage: 10ml/10 litre seawater. Prepare the biopsy equipment by connecting cables to the eliminator and the electric supply net. Cover the eliminator with a plastic bag to avoid dampness and take a syringe from the bottle that is filled with alcohol. Use tweezers. Connect the syringe properly to the biopsy apparatus. This procedure requires two persons: one to hold the fish and the other to take the sample. The biopsy apparatus is started by pressing the switch. If the sampler is right-handed, the syringe should rotate clockwise. When the speed is sufficient, bore the needle through the skin at a 90° angle to the fish, applying sufficient pressure. It should go through the area where the muscle tissue is thickest, e.g., the back or side of the fish. If the fish is large, press the bore into the flesh approximately 10 to 15 mm and stop the apparatus on the way out. Press finger to the hole after withdrawing the needle. For smaller fish turn the apparatus after going through the skin so that the biopsy is taken along the underside of the skin in the length direction of the fish.

When the syringe is taken out of the fish , disconnect it from the biopsy apparatus and take out the sample by using the piston which is kept in alcohol together with the remaining unused syringes. The muscle tissue should be placed carefully in a well on the microtest plate. When all the wells are filled, add one drop of distilled water to each well using a Pasteur pipette so that the muscle tissue is covered. Place the cover over the plate and mark it with a permanent marker. Transport the sample on ice or dry ice at a temperature of approximately 80^{o}C.
The equipment should be rinsed in alcohol between samples.

Shellfish: the biopsy should be taken carefully from the mantle.

Title: **Procedures for sampling of genetic material**	Version: 1.0

4.9.1.6 Sampling for DNA analysis

Cut a small piece of tissue (50-100 mg) and put it in a labelled eppendorf tube, then cap. Place all tubes from the same station/location in a labelled «collection bag», and freeze the samples immediately. If it is not possible to freeze, add 1 ml of 96% ethanol. It is preferable to work the samples in a cool storage room.

5. APPENDIX

5.1 Tables

5.1.1 Table 1. Nation codes.

Official list as of 1987, with addition of non-official codes for Estonia, Latvia, Lithuania and Russia and adjustment for Germany.

06	Germany
07	GDR (until 1989)
11	Belgium
18	Canada
26	Denmark (inc. Faroe Islands and Greenland)
29	Spain
31	USA
34	Finland
35	France
45	Ireland
46	Iceland
58	Norway
64	Netherlands
67	Poland
68	Portugal
70	Dominican Republic
74	Great Britain
77	Sweden
90	USSR (until 1990)
ES	Estonia
LA	Latvia
LT	Lithuania
NA	Namibia
RU	Russia (since 1991)
UK	Ukraine
BL	Belarus

5.1.2 Tables for vessel codes

Ships with IOC/ NODC code are entered in column S: 8-9. The updated list of IOC/ NODC codes can be found at the Department of Marine Environment, IMR.

5.1.2.1 Table 2. IOC/ NODC vessel code: 4

Ship	Valid period	Name	Nation code
AA	1980-	Haakon Mosby	58
JR	1977-	Johan Ruud	58
DR	1974-1993	Dr. Fridtjof Nansen	58
MS	1979-	Michael Sars	58
JH	1991-	Johan Hjort	58
DR	1993-	Dr. Fridtjof Nansen	58
EJ	1983-1990	Eldjarn	58
GS	1970-2003(Feb.)	G.O.Sars	58
GS	2003 (7. mai)-	G.O.Sars	58
GT	2003 (10.Feb.)	Sarsen	58
GD	1987-	G.M. Dannevig	58
FJ	1983-	Fjordfangst	58
JM	1992-	Jan Mayen	58
PR		Peder Rønnestad	58
AQ	19xx-	Polarstern	06
AL	19xx-	Alexander v. Humboldt	07
WH	19xx-	Walther Herwig III	06
SC	19xx	Scoyia	UK
AL	1994	Atlantida	RU
AZ	1987-1988	Artemida	90
PS	1981-1984	Persey II	90
P3	1968	Persey III	RU
PK	19xx-	Poisk	RU
VY	1985-1987	Vilnius	90
P5	1987-	Professor Marti	RU
P2	1988-	Pinro	RU
NF	1990-	Fridtjof Nansen	RU
SC	19xx	Scotia	74
LG	19xx	Lough Foyle	74
TD	19xx	Tridens	64
DA	19xx	Dana	26
AF	19xx	Argos	77
P4	1999-	Persey IV	RU
NT	1990-	Atlantniro	RU
MH	2002	Magnus Heinarson	26

Vessels registered in the former USSR had nation code 90. Vessels used after the collapse of the Soviet Union have been assigned to Russia, Lithuania etc., use the same vessel code as before and the new nation code. The nation code for GDR was 07. The nation code 07 should not be removed for vessels registered in GDR before Germany was unified (1989) and still in operation.

5.1.2.2 Codes for vessels without IOC/ NODC codes.

Codes for radio call signals appear in column S: 8-13. A complete list can be found at the Research vessel Department, IMR. A table of vessel's name, call signal and registration number can be obtained from the SPD-group. The table is updated in accordance with new information. A computer programme for the search for these data exists. The programme is updated every year and can be used in a PC.

Vessel code (S:7) code 1

Commercial fishing vessel:
Ship code with radio call signal (S:8-13) aligned left.

Vessel code (S:7) code 6

Chartered vessel used for research purposes or research vessel which has not yet received an IOC/ NODC-code (Table 5.1.2.1, p. 76).
Ship code with radio call signal (S:8-13) aligned left.

When data are registered from a research vessel without an IOC/NODC code, an application should be made to IOC/NODC for an updated list of codes.

Vessel code (S:7) Code 7

Ship used for aquaculture, special codes.
Vessel code number (S:8-13) aligned right.

Ship for sea ranching	radio call signal	registration	numbering
Aquaculture - cod Masfjorden			1
Aquaculture - cod Austevoll			2
Aquaculture - cod Øygarden			3
Aquaculture - cod Austrheim			4

5.1.3 Table 3. Gear codes (kept in Norwegian).

Gears that are in bold type within a frame indicate standard gear.

31 Bottom trawl

00	Bottom trawl unspec.	Bottom trawl unspecified.
10	Cod trawl unspec.	Cod trawl unspecified.
11	Cod trawl 135+	135 mm mesh size, 270 mm protection net.
12	Cod trawl 135-	135 mm mesh size, without protection net.
13	Fish trawl 100	100 mm mesh size, (Norwegian zone).
14	Fish trawl 80	80 mm mesh size, (Skagerrak, Norwegian zone).
15	Fish trawl 85	85 mm mesh size, (EU-zone).
16	Bottom trawl 135	135 mm mesh size, sorting grid.
17	Bottom trawl	With 50 m groundrope (conv. Shrimp trawl).
18	Fish trawl 60	60 mm mesh size.
20	**GOV-trawl unspec.**	**Sampling trawl, IYFS, North Sea.**
21	Cod trawl 135	135 mm mesh size, w. sorting grid.
22	Cod trawl 135	135 mm mesh size, 55 mm sorting grid.
23	Cod trawl 135	135 mm mesh size, 80 mm sorting grid.
24	Cod trawl 135	135 mm mesh size, 100 mm sorting grid.
25	Cod trawl 135	100 mm mesh size, w. sorting grid.
26	Cod trawl 135	135 mm mesh size, 50 mm sorting grid.
27	Cod trawl 120	120 mm mesg size.
30	Industrial trawl unspec.	Industrial trawl unspecified.
31	Sandeel trawl	Sandeel trawl.
32	Double trawl	Nephrops trawl, 70 mm mesh size
33	Triple trawl	Nephrops trawl, 70 mm mesh size.
34	Single trawl	Nephrops trawl, 70 mm mesh size.
35	Bottom trawl, pair trawl	Bottom trawl, pair trawl
36	Beam trawl	Beam trawl.

32 Shrimp trawl

30	Shrimp trawl unspec.		
31	Shrimp trawl unspec.	70	With 70 mm.
32	Shrimp trawl, C18 18/40		Campelen, 1800 mesh, 18 mm, 40 m. sweeps.
33	Shrimp trawl C18 30/40		Campelen, 1800 mesh, 30 mm, 40 m. sweeps.
34	Shrimp trawl C18 35/20		Campelen, 1800 mesh, 35 mm, 20 m. sweeps.
35	Shrimp trawl C18 35/40		Campelen, 1800 mesh, 35 mm, 40 m. sweeps.
36	Shrimp trawl C18 35/40 Rg		Campelen, 1800 mesh, 35 mm, 40 m. sweeps., Rockhopper gear.
37	Shrimp trawl C18 35/40 70		Campelen, 1800 mesh, 35 mm, 40 m. sweeps 70 mm sort.-panel.
38	Shrimp trawl C18 35/80		Campelen, 1800 mesh, 35 mm, 80 m. sweeps.
39	Shrimp trawl C18 35/80 70		Campelen, 1800 mesh, 35 mm, 80 m. sweeps, 70 mm sort.-panel.
40	Shrimp trawl C18 40/40		Campelen, 1800 mesh, 40 mm, 40 m. Sweeps.
41	Shrimp trawl C18 45/40		Campelen, 1800 mesh, 45 mm, 40 m. Sweeps.
42	Shrimp trawl 12 35		1200 mesh., 35 mm mesh size.
43	Shrimp trawl 12 35	70	1200 mesh., 35 mm mesh size, 70 mm sort. panel.
44	Shrimp trawl 13 35		1300 mesh., 35 mm mesh size.
45	Shrimp trawl 13 35	70	1300 mesh., 35 mm mesh size, 70 mm sort. panel.
46	Shrimp trawl 14 35		1400 mesh., 35 mm mesh size.
47	Shrimp trawl 14 35	70	1400 mesh., 35 mm mesh size, 70 mm sort. panel.
48	Shrimp trawl 16 35		1600 mesh., 35 mm mesh size.
49	Shrimp trawl 16 35	70	1600 mesh., 35 mm mesh size, 70 mm sort. panel.
50	Shrimp trawl 18 35		1800 mesh., 35 mm mesh size.

51	Shrimp trawl 18 35	70	1800 mesh., 35 mm mesh size, 70 mm sort. panel.
52	Shrimp trawl 20 35		2000 mesh., 35 mm mesh size.
53	Shrimp trawl 20 35	70	2000 mesh., 35 mm mesh size, 70 mm sort. panel.
54	Shrimp trawl 28 35		2800 mesh., 35 mm mesh size.
55	Shrimp trawl 28 35	70	2800 mesh., 35 mm mesh size, 70 mm sort. panel.
56	Shrimp trawl 30 35		3000 mesh., 35 mm mesh size.
57	Shrimp trawl 30 35	70	3000 mesh., 35 mm mesh size, 70 mm sort. panel.
58	Shrimp trawl 36 35		3600 mesh., 35 mm mesh size.
59	Shrimp trawl 36 35	70	3600 mesh., 35 mm mesh size, 70 mm sort. panel.
60	Shrimp trawl unspec.	19	Unspecified., 19 mm sort. panel.
61	Shrimp trawl 12 35	19	1200 mesh., 35 mm mesh size, 19 mm sort panel.
62	Shrimp trawl 12 35	19	1300 mesh., 35 mm mesh size, 19 mm sort panel.
63	Shrimp trawl 14 35	19	1400 mesh., 35 mm mesh size, 19 mm sort panel.
64	Shrimp trawl 16 35	19	1600 mesh., 35 mm mesh size, 19 mm sort panel.
65	Shrimp trawl 18 35	19	1800 mesh., 35 mm mesh size, 19 mm sort panel.
66	Shrimp trawl 20 35	19	2000 mesh., 35 mm mesh size, 19 mm sort panel.
67	Shrimp trawl 28 35	19	2800 mesh., 35 mm mesh size, 19 mm sort panel.
68	Shrimp trawl 30 35	19	3000 mesh., 35 mm mesh size, 19 mm sort panel.
69	Shrimp trawl 36 35	19	3600 mesh., 35 mm mesh size, 19 mm sort panel.
70	**Shrimp trawl, C18 20/40 Rg**		**Campelen, 1800 mesh., 20 mm/40 m. sweeps, Rockhopper.**
71	**Shrimp trawl, C18 20/40 Rg**		**Campelen, 1800 mesh., 20 mm/40 m. sweeps, Rockhopper.***
72	Shrimp trawl 24 35	19	2400 mesh., 35 mm mesh size, 19 mm sorting grid.
73	Shrimp trawl 24 40	19	2400 mesh., 40 mm mesh size, 19 mm sorting grid.
74	Shrimp trawl 14 21		1400 mesh., 21 mm mesh size, 50 m groundrope.
75	Shrimp trawl C18/40	Rg	Campelen, 1800 mesh., 20 mm/40 m sweeps, Rockhopper.**
76	Shrimp trawl, multisampler		W. 3 Codends, w. seperate remote contr. Closing/opening (otherwise like code 3271)

34 Trawl unspecified

00	Trål uspes.	Other trawls.
01	IKMT	Isaacs-Kidd Midwater trawl.
10	Semipelagic trawl unspec.	
15	Pair trawl unspec.	.

35 Pelagic trawl

00	Pelagic trawl unspec.	
10	Capelin trawl unspec.	
11	Harstad trawl 10x10	18 x 18 m., without large floats.
12	Harstad trawl 10x10 +	18 x 18 m., with large floats.
13	**Harstad trawl 16x16-**	**29 x 29 m., without large floats.**
14	Harstad trawl 16x16+	29 x 29 m., with large floats.
15	Harstad trawl Rockhg	With rockhopper gear.
16	Firkløver trawl	«4-clover trawl»
17	0-group trawl	10 x 10 m., pelagic trawl.
18	Harstad trawl, multisampler	3 cod-ends with opening/closing control.
19	Pelagic trawl (Russian)	30 m. vertikal opening.
20	Herring trawl unspec.	
21	Herring trawl, Fotø 80	
22	Herring trawl, Fotø 80	With large floats.
23	Herring trawl, Fotø 90	Without large floats.
24	Herring trawl, Fotø 90+	With large floats.
25	Pelagic trawl	Modified Harstad trawl, 15x15 m.
26	Pelagic trawl, 12x12	Harstad trawl, 22x22 m.
30	Blue whiting trawl, unspec.	
31	Blue whiting trawl	450m circumference.

32	Åkra trawl	
33	Åkra trawl	With large floats.
34	Firkløver trawl	With large floats.
40	Triple trawl	
41	Åkra trawl, multisampler	3 cod-ends with opening/closing control.
42	0-groupe trawl	10 x 10 m.,
43	Pelagic trawl, pair trawl	Pelagic trawl, pair trawl
44	Salmon trawl, 24x12m	Salmon trawl, 24x12m.
45	Salmon trawl	Salmon trawl, 236m circumference.
46	Salmon trawl	Salmon trawl (spectra) 50x10 m.
47	Salmon trawl	Salmon trawl, 60x10 m.
48	Makroplanktontrål,	Flytetrål. Maskevidde 3x3 mm, 6x6 m, u/blåse.
49	Makroplanktontrål	Flytetrål. Maskevidde 3x3 mm, 6x6 m,m u/blåse.
50	Makroplanktontrål	Flytetrål. Maskevidde 3x3 mm, 4x4 m, u/blåse.
51	Makroplanktontrål	Flytetrål. Maskevidde 3x3 mm, 4x4 m, u/blåse.

36 Danish seine

00	Seine net unspec.	

37 Purse seine

00	Seine unspec.	
10	Purse seine unspec.	
11	Purse seine, capelin	
12	Purse seine, North Sea	Herring, Mackerel.
13	Purse seine, saithe	
14	Purse seine with light.	
20	Beach seine, large	
21	Beach seine, small	
22	Beach seine with ligth	
30	«Salmon seine»	Large trap net.
31	Wedge-shaped seine	

40 Gillnet

00	Gillnet unspec.	

41 Gillnets (bottom, pelagic), trammel nets

10	BG, unspec.	Bottom gillnet
11	BG, nylon, unspec.	
12	BG, monofilament, unspec.	
13	BG, monofilament	
14	BG, monofilament	
15	BG, monofilament	
16	BG, monofilament	
17	BG, monotwine, unspec.	
18	BG, multimono, unspec.	
19	BG, monofilament	
20	BG, multimono	
21	BG, multimono	
22	BG, multimono	
30	PG, unspec.	Pelagic gillnet (floating)
31	PG, nylon, unspec.	
32	PG, monofilament, unspec.	
34	FG, monotwine, unspec.	

35	PG, multimono, unspec.		
40	BG, unspec.		70mm bar-length.
41	BG, unspec.		80mm bar-length
42	BG, unspec.		90mm bar-length.
43	BG, unspec.		100mm bar-length
44	BG, unspec.		110mm bar-length.
45	BG, unspec.		120mm bar-length.
46	BG, unspec.		130mm bar-length.
47	BG, unspec.		140mm bar-length
48	BG, unspec.		150mm bar-length.
49	BG, unspec.		180mm bar-length.
50	Driftnet (DN)		Free floating gillnet.
51	DN, unspec.		Nylon.
52	DN, unspec.		Monofilament.
53	DN, unspec.		Monotwine.
54	DN, unspec.		Multi-monofilament.
60	Trammel net (TM)		
61	Tgarn monofil 30		Trollgarn 30 omfar. Monofil innergarn, nylon stormasker.
62	Tgarn monofil 18		Trollgarn 18 omfar. Monofil innergarn, nylon stormasker.
63	Tgarn nylon 14		Trollgarn 14 omfar. Nylon.
64	Tgarn nylon 10		Trollgarn 10 omfar. Nylon.
65	Tgarn nylon 24	6	Trollgarn 24 omfar, 6 m. høgt. Nylon.
66	Tgarn nylon 17 3/4	6	Trollgarn 17 3/4 omfar, 6 m. høgt. Nylon.
67	Tgarn nylon 17 3/4	2	Trollgarn 17 3/4 omfar, 2 m. høgt. Nylon.
68	Tgarn nylon 26	2	Trollgarn 26 omfar, 2 m. høgt. Nylon.
69	Tgarn nylon 28	2	Trollgarn 28 omfar, 2 m. høgt. Nylon.
70	Tgarn mulitmono 1,5x4		Trollgarn 12 omfar, nylon stormasker.
71	Tgarn nylon 12		Trollgarn 12 omfar, 2 m høgt. Nylon

42 Traps

00	Trap unspec.	
01	Sediment trap	

43 Trap: Fyke net

00	FN	Fyke net unspec.
11	FN, eel	Single fyke net for eel
12	FN, eel	Double fyke net for eel
13	FN, cod	Single fy fyke net for cod.
14	FN, cod	Double fy fyke net for cod
15	FN, eel	Danish type, 7 rings (hoops), single.
16	FN, eel	Danish type, 2x7 rings (hoops), double.

50 Attracting gear

00	Attracting gears, unspec.,	Attracting gear for fish capture.

51 Longline (LL)

00	(LL), unspec.	
10	LL, demersal	Longline set on bottom.
20	LL, pelagic	Longline set above bottom.
30	LL, vertical	Short longline (5-10 hooks), vertical, near bottom.
40	LL, comb. demersal/pelagic	

52 Handline

00	Handline, unspec.	
10	Jig, unspec.	Handline with jig/lures, operated vertically.
11	Jig, mechanical	Jigging mashine
12	Jig, manual	Jigging, by hand.
20	Jig, unspec.	Handline w. large no. of hooks e.g. for macker
31	Troll line	Handline towed behind vessel.
32	Troll line, mechanical	

53 Creel, pot (C)

00	Creel (pot), unspec.	
01	S-creel without entrance	Conical creel, diam. 1.4m.
02	S- creel without entrance	Conical creel, diam. 1.4m, w. plastic entrance.
03	R-creel	Diam. 1.4m, w. plastic entrance..
04	F-creel	Square (Alaska-type), without entrance.
05	Norway lobster creel	
06	Cod creel	
07	Ocean creel (pot)	
10	Square creel unspec.	
20	S-creel	Conical, unspec.
30	S-creel	As code 5302. Bait: salmon offal.
31	S-creel	As code 5302. Bait: mackerel.
32	S-creel	As code 5302. Bait: haddock.
33	S-creel	As code 5302. Bait: saithe.
34	S-creel	As code 5302. Bait: squid.
35	S-creel	As code 5302. Bait: herring.
36	S-creel	As code 5302. Bait: capelin.
37	S-creel	As code 5302. Bait: salmon offal and haddock.
38	S-creel	As code 5302. Bait: mackerel and saithe.
39	S-creel	As code 5302. Bait: haddock and saithe.
40	S-creel	As code 5302. Bait: scallop.
41	S-creel	As code 5302. Bait: cod.
42	S-creel	As code 5302. Bait: haddock and cod.
43	S-creel	As code 5302. Bait: mackerel and haddock.
44	S-creel	As code 5302. Bait: salmon offal, haddock and cod.
45	S-creel	As code 5302. Bait: saithe, haddock and cod.
46	S-creel	As code 5302. Bait: haddock and redfish.
47	S-creel	As code 5302. Bait: saithe and redfish.
48	S-creel	As code 5302. Bait: salmon and squid.
49	S-creel	As code 5302. Bait: fish offal unspec.
50	S-creel	As code 5302. Bait: salmon and mackerel.
51	S-creel	As code 5302. Bait: wolf-fish.

60 Execution

00	Execution	Tools, gears for execution of organisons/biol. sampling.

61 Explosives

00	Explosives unspec.	

62 Electricity

00 Electricity unspec.

63 Harpun, Harpoon

00	Harpun uspes.	Harpun. Uspesifisert.
01	Sturgeon harpun	

64 Hand weapons

00	Hand weapons, unspec.	
01	Whale gun	

65 Poison

00	Poison, unspec.	

66 Other methods

00	Unspec.	
81	Stomack sample from fish.	
82	Stomack sample from mammals.	
83	Caught by hand.	
84	Caught without gear.	(E.g. flying fish landing on deck).
85	Aqua culture.	
86	Landing net.	

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5.1.4 Table 4. NODC taxonomic codes, Latin names and common names (English and Norwegian)

Below a list of the most frequently occurring species in the Institute of Marine Research data bases. A comprehensive list was published in 1996 (see p. 9).

Taxonomy name	English name	Latin name	Norwegian
87	FISH WITH JAWS I	GNATHOSTOMATA	FISK MED KJEVER I
8703	SHARKS,SKATES,RAYS	SELACHIMORPHA	HAIER
870501		CHLAMYDOSELACHIDAE	KRAGEHAIFAMILIEN
8705010101	FRILLED SHARK	CHLAMYDOSELACHUS ANGUINEUS	KRAGEHAI
870502		HEXANCHIDAE	KAMTANNHAIFAMILIEN
8705020101	SIX-GILLED SHARK	HEXANCHUS GRISEUS	KAMTANNHAI
8706		LAMNIFORMES	GRÅHAIER
870704		LAMNIDAE	HÅBRANNFAMILIEN
8707040302	PORBEAGLE SHARK	LAMNA NASUS	HÅBRANN
8707040401	TRESHER SHARK	ALOPIAS VULPINUS	REVEHAI
8707040501	SHORTFIN MAKO	ISURUS OXYRINCHUS	MAKRELLHAI
8707120101	BASKING SHARK	CETORHINUS MAXIMUS	BRUGDE
8708		SCYLIORHINOIDEI	RØDHAIER
870801	CATSHARKS	SCYLIORHINIDAE	RØDHAIFAMILIEN
8708010203	BLACKMOUTHED DOGFISH	GALEUS MELASTOMUS	HÅGJEL
87080103	DOGFISHES	SCYLIORHINUS	RØDHAISLEKTEN
8708010306	SMALLSPOTTED CATFISH	SCYLIORHINUS CANICULA	SMÅFLEKKET RØDHAI
8708010307	NURSEHOUND	SCYLIORHINUS STELLARIS	STORFLEKKET RØDHAI
870802	REQUIEM SHARK	CARCHARHINIDAE	GRÅHAIFAMILIEN
8708020102	TOPE SHARK	GALEORHINUS GALEUS	GRÅHAI
8708020201	TIGER SHARK	GALEOCERDO CUVIER	TIGERHAI
87080204		MUSTELUS	GLATTHAISLEKTEN
8708020408	STARRY SMOOTHHOUND	MUSTELUS ASTERIAS	HVITFLEKKET GLATTHAI
8708020409	SMOOTHHOUND	MUSTELUS MUSTELUS	GLATTHAI
8708020601	BLUE SHARK	PRIONACE GLAUCA	BLÅHAI
870803	HAMMERHEAD SHARKS	SPHYRNIDAE	HAMMERHAIFAMILIEN
87080301		SPHYRNA	HAMMERHAISLEKTEN
8708030102	SMOOTH HAMMERHEAD	SPHYRNA ZYGAENA	HAMMERHAI
8708030103	SCALLOPED HAMMERHEAD	SPHYRNA LEWINI	
8708030105	SMALLEYE HAMMERHEAD	SPHYRNA TUDES	
8708070101	FALSE CATSHARK	PSEUDOTRIAKIS MICRODON	KATTEHAI
8709		SQUALIFORMES	HÅER
871001	DOGFISH SHARKS	SQUALIDAE	HÅFAMILIEN
8710010102	GREENLAND SHARK	SOMNIOSUS MICROCEPHALUS	HÅKJERRING
87100102		SQUALUS	PIGGHÅSLEKTEN
8710010201	SPURDOG	SQUALUS ACANTHIAS	PIGGHÅ
8710010204	BLAINVILLE'S DOGFISH	SQUALUS FERNANDINUS	
87100105		ETMOPTERUS	SVARTHÅSLEKTEN
8710010503	GREATER LANTERN SHARK	ETMOPTERUS PRINCEPS	STOR SVARTHÅ
8710010510	VELVET BELLY	ETMOPTERUS SPINAX	SVARTHÅ
87100107		OXYNOTUS	TORNHÅSLEKTEN
8710010702	ANGULAR ROUGH SHARK	OXYNOTUS CENTRINA	
8710010703	SAILFIN ROUGHSHARK	OXYNOTUS PARADOXUS	TORNHÅ
8710010901	BLACK DOGFISH	CENTROSCYLLIUM FABRICII	ISLANDSHÅ
87100112		CENTROSCYMNUS	
8710011201	PORTUGUESE DOGFISH	CENTROSCYMNUS COELOLEPIS	DYPVANNSHÅ
8710011202	LONGNOSE VELVET DOGFISH	CENTROSCYMNUS CREPIDATER	BUNNHÅ
8710011401	BIRDBEAK DOGFISH	DEANIA CALCEUS	GRÅHÅ
8710011501		LEPIDORHINUS DENTICULATUS	BRUNHÅ
8710011601	KNIFETOOTH DOGFISH	SCYMNODON RINGENS	KORTPIGGET HÅ
8710011701	DARKIE CHARLIE	SCYMNORHINUS LICHI	SPANSK HÅKJERRING
8710030101	BRANBLE SHARK	ECHINORHINUS BRUCUS	TAGGHAI
8711	ANGEL SHARKS	SQUATINOIDEI	HAVENGLER
871101	ANGEL SHARKS	SQUATINIDAE	HAVENGELFAMILIEN
8711010103	ANGELSHARK	SQUATINA SQUATINA	HAVENGEL
8713	SKATES AND RAYES	RAJIFORMES	SKATER

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871303	ELECTRIC RAYS	TORPEDINIDAE	EL-ROKKEFAMILIEN
87130301	ELECTRIC RAYS	TORPEDO	EL-ROKKESLEKTEN
8713030102	ELECTRIC RAY	TORPEDO NOBILIANA	SVART EL-ROKKE
8713030105	MARBLED ELECTRIC RAY	TORPEDO MARMORATA	FLEKKET EL-ROKKE
871304	SKATES AND RAYES	RAJIDAE	SKATEFAMILIEN
87130401	RAYS	RAJA	SKATESLEKTEN
8713040134	STARRY SKATE	RAJA RADIATA	KLOSKATE
8713040138	BLONDE RAY	RAJA BRACHYURA	PRIKKSKATE
8713040140	SMALL-EYED RAY	RAJA MICROOCELLATA	SPETTESKATE
8713040141	SPOTTED RAY	RAJA MONTAGUI	FLEKKSKATE
8713040142	ARCTIC SKATE	RAJA HYPERBOREA	ISSKATE
8713040143	SKATE	RAJA BATIS	STORSKATE
8713040144	NORWEGIAN SKATE	RAJA NIDAROSIENSIS	SVARTSKATE
8713040145	LONGNOSED SKATE	RAJA OXYRINCHUS	SPISSKATE
8713040146	SHAGREEN RAY	RAJA FULLONICA	NEBBSKATE
8713040147	SANDY RAY	RAJA CIRCULARIS	SANDSKATE
8713040148	CUCKOO RAY	RAJA NAEVUS	GJØKSKATE
8713040150	ROUND RAY	RAJA FYLLAE	RUNDSKATE
8713040151	WHITE SKATE	RAJA ALBA	BURTON-SKATE
8713040153	SAILRAY	RAJA LINTEA	HVITSKATE
8713040158	UNDULATE RAY	RAJA UNDULATA	BØLGESKATE
8713040159	THORNBACK RAY	RAJA CLAVATA	PIGGSKATE
87130408		BATHYRAJA	GRÅSKATESLEKTEN
8713040803	SPINETAIL	BATHYRAJA SPINICAUDA	GRÅSKATE
871305	STINGRAYS	DASYATIDAE	PILSKATEFAMILIEN
8713050111	COMMON STING RAY	DASYATIS PASTINACA	PILSKATE
871307	EAGLE RAYS	MYLIOBATIDAE	ØRNESKATEFAMILIEN
8713070204	COMMON EAGLE RAY	MYLIOBATIS AQUILA	ØRNESKATE
8715		CHIMAERIFORMES	HAVMUSER
871602	RABBITFISHES	CHIMAERIDAE	HAVMUSFAMILIEN
8716020103	LARGE-EYED RABBITFISH	HYDROLAGUS MIRABILIS	BLÅVINGET HAVMUS
8716020202	RABBITFISH	CHIMAERA MONSTROSA	HAVMUS
8717		OSTEICHTHYES	BEINFISKER
8727		ACTINOPTERYGII	STRÅLEFINNEFISKER
8729	STURGEONS	ACIPENSERIFORMES	STØRER
872901	STURGEONS	ACIPENSERIDAE	STØRFAMILIEN
8729010107	STURGEON	ACIPENSER STURIO	STØR
8735	TELEOSTS	TELEOSTEI	EGENTLIGE BEINFISKER
8736		ELOPOMORPHA	
8740	EELS	ANGUILLIFORMES	ÅLEFISKER
874101	EELS	ANGUILLIDAE	ÅLEFAMILIEN
8741010102	EUROPEAN EEL	ANGUILLA ANGUILLA	ÅL
874105	MORAY EELS	MURAENIDAE	MURENEFAMILIEN
8741050505	MORAY EEL	MURAENA HELENA	MURENE
874112	CONGER EELS	CONGRIDAE	HAVÅLFAMILIEN
8741120111	EUROPEAN CONGER EEL	CONGER CONGER	HAVÅL
87411801		DERICHTHYS	
8741180101		DERICHTHYS SERPENTINUS	
8741200102		SERRIVOMER BEANI	NEBBÅL
874121	SNIPE EELS	NEMICHTHYIDAE	SNEPPEÅLFAMILIEN
8741210202	SNIPE EEL	NEMICHTHYS SCOLOPACEUS	SNEPPEÅL
8743		NOTACANTHIFORMES	PIGGÅLER
874303	SPINY EELS	NOTACANTHIDAE	PIGGÅLFAMILIEN
8743030301	CHEMNIT'S SPINY-EEL	NOTACANTHUS CHEMNITZII	NORDLIG PIGGÅL
8745		CLUPEIFORMES	SILDEFISKER
874701	HERRINGS	CLUPEIDAE	SILDEFAMILIEN
87470101	SHADS	ALOSA	
8747010107	ALLIS SHAD	ALOSA ALOSA	MAISILD
8747010109	TWAITE SHAD	ALOSA FALLAX	STAMSILD
8747010201	ATLANTIC HERRING	CLUPEA HARENGUS	SILD
874701020103	ATLANTIC HERRING	CLUPEA HARENGUS	NORSK VÅRGYTENDE SILD
874701020105	ATLANTIC HERRING	CLUPEA HARENGUS	NORDSJØSILD
874701020107	ATLANTIC HERRING	CLUPEA HARENGUS	KVITSJØSILD
874701020107	ATLANTIC HERRING	CLUPEA HARENGUS	TRONDHEIMSFJORDSILD
8747011701	SPRAT	SPRATTUS SPRATTUS	BRISLING
8747012201	EUROPEAN PILCHARD	SARDINA PILCHARDUS	SARDIN
874702	ANCHOVIES	ENGRAULIDAE	ANSJOSFAMILIEN
8747020104	EUROPEAN ANCHOVY	ENGRAULIS ENCRASICOLUS	ANSJOS
8754		SALMONIFORMES	LAKSEFISKER
875501	SALMONS	SALMONIDAE	LAKSEFAMILIEN

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87550101	WHITEFISH	COREGONUS	
8755010115	HOUTING	COREGONUS LAVARETUS	SIK
8755010116	VENDACE	COREGONUS ALBULA	LAGESILD
87550102	PINK SALMON	ONCORHYNCHUS	
8755010201	PINK SALMON	ONCORHYNCHUS GORBUSCHA	PUKKELLAKS
8755010202	CHUM SALMON	ONCORHYNCHUS KETA	KETALAKS
8755010211	RAINBOW TROUT	SALMO GAIRDNERI	REGNBUEAURE
87550103	TROUTS	SALMO	
8755010305	ATLANTIC SALMON	SALMO SALAR	LAKS
8755010306	TROUT	SALMO TRUTTA	AURE
87550104	CHARS	SALVELINUS	RØYESLEKTEN
8755010402	CHARR	SALVELINUS ALPINUS	RØYE
8755010404	BROOK CHARR	SALVELINUS FONTINALIS	BEKKERØYE
8755010704	GRAYLING	THYMALLUS THYMALLUS	HARR
875503		OSMERIDAE	LODDEFAMILIEN
8755030201	CAPELIN	MALLOTUS VILLOSUS	LODDE
8755030301	SMELT	OSMERUS EPERLANUS	KRØKLE
8756		ARGENTINOIDEI	VASSILDFISKER
875601	ARGENTINES	ARGENTINIDAE	VASSILDFAMILIEN
87560101		NANSENIA	
8756010102	GREENLAND ARGENTINE	NANSENIA GROENLANDICA	
8756010103	FORGOTTEN ARGENTINE	NANSENIA ARDESIACA	
87560102		ARGENTINA	VASSILDSLEKTEN
8756010203	GREATER ARGENTINE	ARGENTINA SILUS	VASSILD
8756010209	ARGENTINE	ARGENTINA SPHYRAENA	STRØMSILD
8758		ESOCOIDEI	GJEDDEFISKER
875801		ESOCIDAE	GJEDDEFAMILIEN
8758010101	EUROPEAN PIKE	ESOX LUCIUS	GJEDDE
8759		STOMIOIDEI	LAKSESILDFISKER
875901	LIGHTFISHES	GONOSTOMATIDAE	LAKSESILDFAMILIEN
87590101		CYCLOTHONE	LAKSESILDSLEKTEN
8759010501	PEARLSIDE	MAUROLICUS MUELLERI	LAKSESILD
875902		STERNOPTYCHIDAE	PERLEMORFISKFAMILIEN
87590201		ARGYROPELECUS	PERLEMORFISKSLEKTEN
8759020102		ARGYROPELECUS ACULEATUS	PIGGHALET PERLEMORSFISK
8759020106		ARGYROPELECUS HEMIGYMNUS	FLEKKET PERLEMORSFISK
8759020107	HATCHET FISH	ARGYROPELECUS OLFERSI	STOR PERLEMORFISK
875903	SNAGGLE TOOTHS	ASTRONESTHIDAE	ULVEKJEFTFAMILIEN
875904	SCALELESS DRAGONFISHES	MELANOSTOMIIDAE	
875906	VIPERFISHES	CHAULIODONTIDAE	
8759060103	SLOANE'S VIPERFISH	CHAULIODUS SLOANI	SEGLTANNFISK
875907	SCALY DRAGONFISHES	STOMIIDAE	DRAGEKJEFTFAMILIEN
8759070202		STOMIAS FEROX	BOAFISK
8759080101		IDIACANTHUS FASCIOLA	
876001		ALEPOCEPHALIDAE	
8760011201	BLUESNOUT SMOOTH-HEAD	XENODERMICHTHYS COPEI	KORTSNUTET GLATTHODEFISK
87610101		BATHYLACO	
8761010101		BATHYLACO NIGRICANS	
8762		MYCTOPHIFORMES	LYSPRIKKFISKER
876207	BARRACUDINAS	PARALEPIDIDAE	LAKSETOBISFAMILIEN
8762070201		NOTOLEPIS RISSOI	LITEN LAKSETOBIS
8762070402		PARALEPIS COREGONOIDES	STOR LAKSETOBIS
876214	LANTERNFISHES	MYCTOPHIDAE	LYSPRIKKFAMILIEN
87621401		CERATOSCOPELUS	
8762140315		LAMPANYCTUS MACDONALDI	BRUN LYSPRIKKFISK
8762140405		NOTOSCOPELUS KROEYERI	STOR LYSPRIKKFISK
8762140901		BENTHOSEMA GLACIALE	NORDLIG LYSPRIKKFISK
8762141003		PROTOMYCTOPHUM ARCTICUM	NORDATLANTISK LYSPRIKKFIS
8762141504		MYCTOPHUM PUNCTATUM	LITEN LYSPRIKKFISK
876701	TELOSCOPEFISH	GIGANTURIDAE	
8784		GOBIESOCIFORMES	DOBBELTSUGERE
878401	CLINGFISHES	GOBIESOCIDAE	DOBBELTSUGERFAMILIEN
87840106		LEPADOGASTER	
8784010601	CONNEMARRA CLINGFISH	LEPADOGASTER CANDOLLEI	STOR DOBBELTSUGER
8784010603	SHORE CLINGFISH	LEPADOGASTER LEPADOGASTER	KYSTDOBBELTSUGER
87840107		DIPLECOGASTER	
8784010701	TWO SPOTTED CLINGFISH	DIPLECOGASTER BIMACULATA	DOBBELTSUGER
8784010801	SMALL-HEADED CLINGFISH	APLETODON MICROCEPHALUS	SMÅHODET DOBBELTSUGER
8785		LOPHIIFORMES	MARULKER
8786		LOPHIOIDEI	BREIFLABBFISKER

878601	ANGLERFISH	LOPHIIDAE	BREIFLABBFAMILIEN
87860101		LOPHIUS	BREIFLABBSLEKTEN
8786010103	ANGLERFISH (MONK)	LOPHIUS PISCATORIUS	BREIFLABB
8786010104	WHITE ANGLERFISH	LOPHIUS BUDEGASSA	
8787		ANTENNARIOIDEI	TANGULKEFISKER
878702	FROGFISHES	ANTENNARIIDAE	SARGASSOULKEFAMILIEN
8787020101	FROGFISH	HISTRIO HISTRIO	SARGASSOULKE
8787020203	BIG-EYED FROGFISH	ANTENNARIUS RADIOSUS	
8789		GADIFORMES	TORSKEFISKER
879101		MORIDAE	MORAFISKFAMILIEN
87910105		LEPIDION	
8791010501		LEPIDION EQUES	
879103	COD FISHES	GADIDAE	TORSKEFAMILIEN
87910301		ARCTOGADUS	ISTORSKER
8791030102		ARCTOGADUS GLACIALIS	ISTORSK
8791030201	POLAR COD	BOREOGADUS SAIDA	POLARTORSK
87910304		GADUS	TORSKESLEKTEN
8791030402	COD	GADUS MORHUA	TORSK
8791030403	GREENLAND COD	GADUS OGAC	UVAK
8791030702		THERAGRA FINNMARCHICA	BERLEVÅGFISK
8791030801	BURBOT	LOTA LOTA	LAKE
87910309		POLLACHIUS	
8791030901	SAITHE	POLLACHIUS VIRENS	SEI
8791030902	POLLACK	POLLACHIUS POLLACHIUS	LYR
8791031101	TORSK	BROSME BROSME	BROSME
87910313		MELANOGRAMMUS	
8791031301	HADDOCK	MELANOGRAMMUS AEGLEFINUS	HYSE
8791031501	FOUR-BEARDED ROCKLING	RHINONEMUS CIMBRIUS	FIRETRÅDET TANGBROSME
8791031602	GREATER FORK-BEARD	PHYCIS BLENNOIDES	SKJELLBROSME
87910317		TRISOPTERUS	
8791031701	POOR-COD	TRISOPTERUS MINUTUS	SYPIKE
8791031702	BIB	TRISOPTERUS LUSCUS	SKJEGGTORSK
8791031703	NORWAY POUT	TRISOPTERUS ESMARKII	ØYEPÅL
8791031801	WHITING	MERLANGIUS MERLANGUS	HVITTING
87910319		MOLVA	LANGESLEKTEN
8791031901	LING	MOLVA MOLVA	LANGE
8791031902	BLUE LING	MOLVA DYPTERYGIA	BLÅLANGE
8791031904	SPANISH LING	MOLVA MACROPTHALMA	
87910320	ROCKLINGS	GAIDROPSARUS	TANGBROSMESLEKTEN
8791032001	THREE-BEARDED ROCKLING	GAIDROPSARUS VULGARIS	TRETRÅDET TANGBROSME
8791032002	SHORE ROCKLING	GAIDROPSARUS MEDITERRANEUS	STRANDTANGBROSME
8791032101	SILVERY POUT	GADICULUS ARGENTEUS	SØLVTORSK
8791032201	BLUE WHITING	MICROMESISTIUS POUTASSOU	KOLMULE
8791032301	TADPOLE-FISH	RANICEPS RANINUS	PADDETORSK
87910324		CILIATA	
8791032401	FIVE-BEARDED ROCKLING	CILIATA MUSTELLA	FEMTRÅDET TANGBROSME
8791032402	NORTHERN ROCKLING	CILIATA SEPTEMTRIONALIS	NORDLIG TANGBROSME
8791032501	ARCTIC ROCKLING	ONOGADUS ARGENTATUS	SØLVTANGBROSME
8791032601	BIGEYE ROCKLING	ANTONOGADUS MACROPHTHALMUS	STORØYET TANGBROSME
879104	HAKES	MERLUCCIIDAE	LYSINGFAMILIEN
8791040105	HAKE	MERLUCCIUS MERLUCCIUS	LYSING
8792		OPHIDIODEI	SLANGEFISKER
879202	PEARLFISHES	CARAPIDAE	SNYLTEFISKFAMILIEN
8792020202	PEARLFISH	ECHIODON DRUMONDI	SNYLTEFISK
8793		ZOARCOIDEI	ÅLEKVABBER
879301	EEL-POUTS	ZOARCIDAE	ÅLEBROSMEFAMILIEN
87930104		GYMNELIS	
8793010403		GYMNELIS VIRIDIS	GRØNLANDSÅLEBROSME
8793010404		GYMNELIS RETRODORSALIS	SPITSBERGENÅLEBROSME
87930105		LYCENCHELYS	
8793010513		LYCENCHELYS SARSI	SØRLIG ÅLEBROSME
8793010514		LYCENCHELYS MURAENA	HAVÅLEBROSME
8793010516		LYCENCHELYS KOLTHOFFI	MARMORERT ÅLEBROSME
87930107		LYCODES	ÅLEBROSMESLEKTEN
8793010715		LYCODES EUDIPLEUROSTICTUS	BÅNDÅLEBROSME
8793010716		LYCODES SEMINUDUS	STORHODET ÅLEBROSME
8793010721		LYCODES PALLIDUS	BLEK ÅLEBROSME
8793010722		LYCODES RETICULATUS	NETTÅLEBROSME
8793010723		LYCODES ROSSI	NORDLIG ÅLEBROSME
8793010724	VAHL'S EELPOUT	LYCODES VAHLII	VANLIG ÅLEBROSME

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8793010724	VAHL'S EELPOUT	LYCODES VAHLII	ÅLEBROSME
8793010725	ESMARK'S EELPOUT	LYCODES ESMARKI	ULVEFISK
8793010726		LYCODES FRIGIDIS	ARKTISK ÅLEBROSME
8793010727		LYCODES LUTKENI	
8793010730		LYCODES SQUAMIVENTER	SKJELLÅLEBROSME
8793012001	EEL-POUT	ZOARCES VIVIPARUS	ÅLEKVABBE
8793012101		RHIGOPHILA DEARBORNI	SPISSHALET ÅLEBROSME
8794		MACROURIDEI	SKOLESTER
879401	GRENADIERS	MACROURIDAE	SKOLESTFAMILIEN
8794010117	ROUNDNOSE GRENADIER	CORYPHAENOIDES RUPESTRIS	SKOLEST
87940104		COELORHYNCHUS	
8794010403	SPEAR-SNOUTED GRENADIER	COELORHYNCHUS OCCA	PIGGSKJELLET SKOLEST
8794010405	BLACKSPOT GRENADIER	CAELORINCHUS CAELORHINCUS	SPIRITIST
8794010601	SOFTHEADED GRENADIER	MALACOCEPHALUS LAEVIS	SMÅSKJELLET SKOLEST
8794010801	SMOOTH GRENADIER	NEZUMIA AEQUALIS	HØYRYGGET SKOLEST
87940115		TRACHYRHYNCHUS	
8794011501	ROUGHNOSED RATTAIL	TRACHYRHYNCHUS TR.	SPISSNUTET SKOLEST
8794011502	MURRAY'S RATTAIL	TRACHYRHYNCHUS MURRAYI	
8794011601	ROUGH RATTAIL	MACROURUS BERGLAX	ISGALT
88	FISH WITH JAWS II	GNATHOSTOMATA II	FISK MED KJEVER II
8803		EXOCOETOIDEI	FLYGEFISKER
880301	FLYING FISHES	EXOCOETIDAE	FLYGEFISKFAMILIEN
88030101		CHIELOPOGON	FLYGEFISKSLEKTEN
8803010101	FLYING FISH	CYPSELURUS HETERURUS	FLYGEFISK
8803010106	ATLANTIC FLYING FISH	CYPSELURUS PINNATIBARBATUS	
880302	NEEDLEFISHES	BELONIDAE	HORNGJELFAMILIEN
8803020502	GARFISH	BELONE BELONE	HORNGJEL
880303	SAURIES	SCOMBERESOCIDAE	MAKRELLGJEDDEFAMILIEN
8803030201	SAURY PIKE	SCOMBERESOX SAURUS	MAKRELLGJEDDE
8805		ATHERINOIDEI	STRIPEFISKER
880502	SAND-SMELTS	ATHERINIDAE	STRIPEFISKFAMILIEN
88050210		ATHERINA	STRIPEFISKSLEKTEN
8805021002		ATHERINA BOYERI	STORØYET STRIPEFISK
8805021003	SAND SMELT	ATHERINA PRESBYTER	STRIPEFISK
8810	BERCOID FISHES	BERYCOIDEI	BERYXFISKER
8810010101		DIRETMUS ARGENTEUS	
8810020201	ORANGE ROUGHY	HOPLOSTETHUS ATLANTICUS	
8810020202		HOPLOSTETHUS MEDITERRANEUS	
881005		BERYCIDAE	BERYXFAMILIEN
88100501		BERYX	BERYXSLEKTEN
8810050101	ALFONSINO	BERYX DECADACTYLUS	BERYX
8810050102	ALFONSINO	BERYX SPLENDENS	RØD BERYX
8811		ZEIFORMES	ST.PETERSFISKER
881103	DORIES	ZEIDAE	ST.PETERSFISKFAMILIEN
8811030301	JOHN DORY	ZEUS FABER	ST.PETERSFISK
881106	BOARFISHES	CAPROIDAE	VILLSVINFISKFAMILIEN
8811060301	BOARFISH	CAPROS APER	VILLSVINFISK
8812		LAMPRIDIFORMES	BÅNDFISKER
8813		LAMPROIDEI	LAKSESTØRJER
881301		LAMPRIDAE	LAKSESTØRJEFAMILIEN
8813010102	OPAH	LAMPRIS GUTTATUS	LAKSESTØRJE
8815		TRACHIPTEROIDEI	SØLVKVEITER
881502	RIBBONFISHES	TRACHIPTERIDAE	SØLVKVEITEFAMILIEN
8815020102	DEAL-FISH	TRACHIPTERUS ARCTICUS	SØLVKVEITE
881503		REGALECIDAE	SILDEKONGEFAMILIEN
8815030101	OAR FISH	REGALECUS GLESNE	SILDEKONGE
8816		STYLEPHOROIDEI	
881601	THREAD TAIL	STYLEPHORIDAE	
88160101		STYLEPHORUS	
8816010101	THREAD TAIL	STYLEPHORUS CHORDATUS	
8817		GASTEROSTEIFORMES	NÅLE- OG STINGSILDFISKER
8818		GASTEROSTEOIDEI	STINGSILDFISKER
881801	STICKLEBACKS	GASTEROSTEIDAE	STINGSILDFAMILIEN
8818010101	THREE-SPINED STICKLEBACK	GASTEROSTEUS ACULEATUS	TREPIGGET STINGSILD
8818010201	TEN-SPINED STICKLEBACK	PUNGITIUS PUNGITIUS	NIPIGGET STINGSILD
8818010501	SEA STICKLEBACK	SPINACHIA SPINACHIA	TANGSTIKLING
881903	TRUMPET FISH	MACRORHAMPHOSIDAE	TROMPETFISKFAMILIEN
8819030101	SNIPE-FISH	MACRORHAMPHOSUS SCOLOPAX	TROMPETFISK
8820		SYNGNATHOIDEI	NÅLEFISKER
882002	PIPEFISHES AND SEAHORSES	SYNGNATHIDAE	NÅLEFISKFAMILIEN

88200201		SYNGNATHUS	KANTNÅLER
88200201		SYNGNATHUS	NÅLEFISKSLEKTEN
8820020119	NILSSON' PIPEFISH	SYNGNATHUS ROSTELLATUS	LITEN KANTNÅL
8820020120	GREAT PIPE-FISH	SYNGNATHUS ACUS	STOR KANTNÅL
8820020123	DEEP-SNOUTED PIPE-FISH	SYNGNATHUS TYPHLE	TANGSNELLE
8820020210	SEA HORSE	HIPPOCAMPUS RAMULOSUS	SJØHEST
8820022101	SNAKE PIPE-FISH	ENTELURUS AEQUERIUS	STOR HAVNÅL
88200222		NEROPHIS	
8820022201	WORM PIPE-FISH	NEROPHIS LUMBRICIFORMIS	KRUMSNUTET HAVNÅL
8820022202	STRAIGHT-NOSED PIPE-FISH	NEROPHIS OPHIDION	LITEN HAVNÅL
8825		SCORPAENIFORMES	ULKEFISKER
882601	SCORPIONFISHES	SCORPAENIDAE	UERFAMILIEN
88260101	REDFISHES	SEBASTES	UERSLEKTEN
8826010139	GOLDEN REDFISH	SEBASTES MARINUS	UER
8826010139	NORWAY HADDOCK	SEBASTES MARINUS	VANLIG UER
8826010151	DEEP-SEA REDFISH	SEBASTES MENTELLA	SNABELUER
882601015101	DEEP-SEA REDFISH	SEBASTES MENTELLA	OSEANISK SNABELUER
8826010175	NORWAY REDFISH	SEBASTES VIVIPARUS	LUSUER
8826010301	BLUE-MOUTH REDFISH	HELICOLENUS DACTYLOPTERUS	BLÅKJEFT
882602	E.ATLANTIC GURNARDS	TRIGLIDAE	KNURRFAMILIEN
8826020316	ARMED GURNARD	PERISTEDION CATAPHRACTUM	
88260205	GURNARDS	TRIGLA	
8826020501	TUB GURNARD	TRIGLA LUCERNA	RØDKNURR
8826020503	GURNARD	TRIGLA LYRA	LYREKNURR
8826020601	GREY GURNARD	EUTRIGLA GURNARDUS	KNURR
8826020701	STREAKED GURNARD	TRIGLOPORUS LASTOVIZA	TAGGKNURR
88260208		ASPITRIGLA	
8826020801	RED GURNARD	ASPITRIGLA CUCULUS	TVERRSTRIPET KNURR
8826020802	LONGFIN GURNARD	ASPITRIGLA OBSCURA	
883101		ICELIDAE	TORNULKEFAMILIEN
8831010101	TWOHORN SCULPIN	ICELUS BICORNIS	TORNULKE
883102	BULLHEADS AND SCULPINS	COTTIDAE	ULKEFAMILIEN
8831020307		ARTEDIELLUS ATLANTICUS	
8831020308		ARTEDIELLUS EUROPAEUS	KROKULKE
88310208		COTTUS	
8831020825	BULLHEAD	COTTUS GOBIO	HVITFINNET STEINULKE
8831020826	ALPINE BULLHEAD	COTTUS GRACILIS	STEINSMETT
8831021304	ARCTIC STAGHORN SCULPIN	GYMNOCANTHUS TRICUSPIS	GLATTULKE
88310222		MYOXOCEPHALUS	
8831022205	FOUR HORNED SCULPIN	MYOXOCEPHALUS QUADRICORNIS	HORNULKE
8831022207	BULL-ROUT	MYOXOCEPHALUS SCORPIUS	VANLIG ULKE
88310238		TRIGLOPS	KNURRULKESLEKTEN
8831023805	RIBBED SCULPIN	TRIGLOPS PINGELI	KNURRULKE
8831023807	MOUSTACHE SCULPIN	TRIGLOPS MURRAYI	NORDLIG KNURRULKE
8831023808		TRIGLOPS NYBELINI	KNURRULKE
88310246		TAURULUS	
8831024601	SEA SCORPION	TAURULUS BUBALIS	DVERGULKE
8831024602	NORWAY BULLHEAD	TAURULUS LILLJEBORGI	PIGGULKE
883106		COTTUNCULIDAE	PADDEULKEFAMILIEN
8831060101		COTTUNCULUS MICROPS	PADDEULKE
883108	POACHERS	AGONIDAE	PANSERULKEFAMILIEN
8831080303	ARCTIC ALLIGATORFISH	ASPIDOPHOROIDES OLRIKI	ARKTISK PANSERULKE
8831080803	HOOKNOSE	AGONUS CATAPHRACTUS	PANSERULKE
8831081801	ATLANTIC POACHER	AGONUS DECAGONUS	TISKJEGG
8831081801	ATLANTIC POACHER	LEPTAGONUS DECAGONUS	TISKJEGG
883109	SNAILFISHES AND LUMPSUCKE	CYCLOPTERIDAE	RINGBUKFAMILIEN
883109	SNAILFISHES AND LUMPSUCKE	CYCLOPTERIDAE	ROGNKJEKS OG RINGBUKFAMILI
88310902		CAREPROCTUS	
8831090232		CAREPROCTUS LONGIPINNIS	LITEN RINGBUK
8831090234		CAREPROCTUS REINHARDTI	NORDLIG RINGBUK
8831090405	ARCTIC LUMPSUCKER	CYCLOPTEROPSIS MACALPINI	ARKTISK ROGNKJEKS
88310905		EUMICROTREMUS	
8831090504	LEATHERFIN LUMPSUCKER	EUMICROTREMUS DERJUGINI	SVARTKJEKS
8831090508		EUMICROTREMUS SPINOSUS	VORTEKJEKS
88310908	SEA SNAILS	LIPARIS	
8831090815		LIPARIS KOEFOEDI	KOEFOEDS RINGBUK
8831090828	SEA SNAIL	LIPARIS LIPARIS	VANLIG RINGBUK
8831090831	MONTAGU'S SEA SNAIL	LIPARIS MONTAGUI	KYSTRINGBUK
8831090832		LIPARIS SCHANTARENSIS	POLARRINGBUK
88310909		LIPARISCUS	

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8831090901		LIPARISCUS NANUS	KONGERINGBUK
8831091114		PARALIPARIS BATHYBII	SVART RINGBUK
8831091501	LUMPSUCKER	CYCLOPTERUS LUMPUS	ROGNKJEKS
8834		PERCIFORMES	PIGGFINNEFISKER
8835		PERCOIDEI	ABBORFISKER
883502	BASSES AND SEA-PERCHES	SERRANIDAE	HAVABBORFAMILIEN
8835022801	WRECK-FISH	POLYPRION AMERICANUS	VRAKFISK
883516		CENTRARCHIDAE	LAKSEABBORFAMILIEN
8835160602	LARGE-MOUTHED BASS	MICROPTERUS SALMOIDES	LAKSEABBOR
883518		APOGONIDAE	DYPHAVSABBORFAMILIEN
8835180403		EPIGONUS TELESCOPUS	DYPHAVSABBOR
883527		ECHENEIDIDAE	SUGEFISKFAMILIEN
8835270103	SHARK SUCKER	REMORA REMORA	SUGEFISK
883528	JACKS	CARANGIDAE	TAGGMAKRELLFAMILIEN
8835280103	HORSE MACKEREL	TRACHURUS TRACHURUS	TAGGMAKRELL
8835281501	PILOT FISH	NAUCRATES DUCTOR	LOSFISK
8835330103		CARISTIUS GROENLANDICUS	MANKEFISK
883543	SEA BREAMS	SPARIDAE	HAVKARUSSFAMILIEN
88354308		PAGELLUS	PAGELLSLEKTEN
8835430801	RED SEABREAM	PAGELLUS BOGARAVEO	FLEKKPAGELL
8835430804	PANDORA	PAGELLUS ERYTHRINUS	RØDPAGELL
8835430901	BOGUE	BOOPS BOOPS	OKSEØYEFISK
8835431101	GILT-HEAD SEABREAM	SPARUS AURATUS	
8835431201	BLACK SEA BREAM	SPONDYLIOSOMA CANTHARUS	HAVKARUSS
883544	DRUMS	SCIAENIDAE	ØRNEFISKFAMILIEN
8835442701	MEAGRE	ARGYROSOMUS REGIUS	ØRNEFISK
883545	GOATFISHES	MULLIDAE	MULLEFAMILIEN
8835450202	RED MULLET	MULLUS SURMULETUS	MULLE
883571	BREAMS	BRAMIDAE	HAVBRASMEFAMILIEN
8835710102	RAY'S BREAM	BRAMA BRAMA	HAVBRASME
8835710301		PTERYCOMBUS BRAMA	SØLVBRASME
8835710403		TARACTES ASPER	HØYFINNET HAVBRASME
8835720101	EUROPEAN SEABASS	DICENTRARCHUS LABRAX	HAVÅBOR
8836		MUGILOIDEI	MULTEFISKER
883601	MULLETS	MUGILIDAE	MULTEFAMILIEN
8836010704	THICK-LIPPED MULLET	CHELON LABROSUS	TYKKLEPPET MULTE
8836010901	THIN-LIPPED MULLET	LIZA RAMADA	TYNNLEPPET MULTE
8836010902	GOLDEN MULLET	LIZA AURATA	GULLMULTE
8839	WRASSES	LABROIDEI	BERGGYLTEFISKER
883901	WRASSES	LABRIDAE	LEPPEFISKFAMILIEN
8839012306		CORIS JULIS	JUNKERGYLTE
8839013301	CORKWING	CRENILABRUS MELOPS	GRØNNGYLT
8839013401	SMAL-MOUTED WRASSE	CENTROLABRUS EXOLETUS	GRASGYLT
8839013501	COLD-SINNY	CTENOLABRUS RUPESTRIS	BERGNEBB
8839013603	BALLAN WRASSE	LABRUS BERGYLTA	BERGGYLT
8839013604	CUCKOO WRASSE	LABRUS BIMACULATUS	BLÅSTÅL OG RØDNEBB
8839013701	SMALL-RAYED WRASSE	ACANTHOLABRUS PALLONI	BRUNGYLT
8840		TRACHINOIDEI	FJESINGFISKER
884006		TRACHINIDAE	FJESINGFAMILIEN
88400601		TRACHINUS	FJESINGSLEKTEN
8840060101	LESSER WEEVER	TRACHINUS VIPERA	DVERGFJESING
8840060102	GREATER WEEVER	TRACHINUS DRACO	FJESING
8842		BLENNIOIDEI	SLIMFISKER
884201	BLENNIES	BLENNIIDAE	TANGKVABBEFAMILIEN
88420101		BLENNIUS	TANGKVABBESLEKTEN
8842010104	BUTTERFLY BLENNY	BLENNIUS OCELLARIS	ØYEFLEKKET TANGKVABBE
8842010110	TOMPOT BLENNY	BLENNIUS GATTORUGINE	STEINBORER
8842010115	SHANNY	BLENNIUS PHOLIS	TANGKVABBE
884202	ROCKFISHES	ANARHICHADIDAE	STEINBITFAMILIEN
88420201	CATFISHES	ANARHICHAS	STEINBITSLEKTEN
8842020102	JELLY CATFISH	ANARHICHAS DENTICULATUS	BLÅSTEINBIT
8842020103	CAT-FISH	ANARHICHAS LUPUS	GRÅSTEINBIT
8842020104	SPOTTED CATFISH	ANARHICHAS MINOR	FLEKKSTEINBIT
884212	PRICKLEBACKS	STICHAEIDAE	HORNKVABBEFAMILIEN
884212	PRICKLEBACKS	STICHAEIDAE	LANGEBARNFAMILIEN
8842120505	YARREL'S BLENNY	CHIROLOPHIS ASCANII	HORNKVABBE
88421209		LUMPENUS	
8842120901		LUMPENUS FABRICII	ARKTISK LANGEBARN
8842120905	SNAKE BLENNY	LUMPENUS LUMPRETAEFORMIS	LANGHALET LANGEBARN
8842121801	SPOTTED SNAKE BLENNY	LEPTOCLINUS MACULATUS	TVERRHALET LANGEBARN

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8842122301		ANISARCHUS MEDIUS	RUNDHALET LANGEBARN
884213	GUNNELS	PHOLIDAE	TANGSPRELLFAMILIEN
8842130209	BUTTERFISH	PHOLIS GUNNELLUS	TANGSPRELL
8845		AMMODYTOIDEI	SILFISKER
884501	SANDEELS	AMMODYTIDAE	SILFAMILIEN
88450101	SANDEELS	AMMODYTES	TOBIS
8845010105	LESSER SANDEEL	AMMODYTES TOBIANUS	SMÅSIL
8845010106	SANDEEL	AMMODYTES MARINUS	HAVSIL
8845010201	SMOTH SANDEEL	GYMNAMMODYTES SEMISQUAMATUS	GLATTSIL
88450103		HYPEROPLUS	
8845010301	GREATER SANDEEL	HYPEROPLUS LANCEOLATUS	STORSIL
8845010302	IMMACULATE SANDEEL	HYPEROPLUS IMMACULATUS	UFLEKKET STORSIL
8846		CALLIONYMOIDEI	FLØYFISKER
884601	DRAGONETS	CALLIONYMIDAE	FLØYFISKFAMILIEN
88460101		CALLIONYMUS	FLØYFISKSLEKTEN
8846010106	COMMON DRAGONET	CALLIONYMUS LYRA	VANLIG FLØYFISK
8846010107	SPOTTED DRAGONET	CALLIONYMUS MACULATUS	FLEKKET FLØYFISK
8846010120	RETICULATE DRAGONET	CALLIONYMUS RETICULATUS	LITEN FLØYFISK
8847	GOBIES	GOBIOIDEI	KUTLINGFISKER
884701	GOBIES	GOBIIDAE	KUTLINGFAMILIEN
88470113	GOBIES	GOBIUS	
8847011316	BLACK GOBY	GOBIUS NIGER	SVARTKUTLING
8847011320	ROCK GOBY	GOBIUS PAGANELLUS	KLIPPEKUTLING
88470149		CRYSTALLOGOBIUS	
8847014901	CRYSTAL GOBY	CRYSTALLOGOBIUS LINEARIS	KRYSTALLKUTLING
88470150		GOBIUSCULUS	
8847015001	TWO-SPOT GOBY	GOBIUSCULUS FLAVESCENS	TANGKUTLING
88470151		POMATOSCHISTUS	
8847015101	SAND GOBY	POMATOSCHISTUS MINUTUS	SANDKUTLING
8847015102	PAINTED GOBY	POMATOSCHISTUS PICTUS	BERGKUTLING
8847015103	COMMON GOBY	POMATOSCHISTUS MICROPS	LEIRKUTLING
8847015104	NORWEGIAN GOBY	POMATOSCHISTUS NORVEGICUS	MUDDERKUTLING
8847016501	DIMINUTIVE GOBY	LEBETUS SCORPIOIDES	ULKEKUTLING
8847016601	TRANSPARENT GOBY	APHIA MINUTA	GLASSKUTLING
8847016701	FRIE'S GOBY	LESUEURIGOBIUS SUERII	SPISSHALET KUTLING
8847016802	JEFFREY'S GOBY	BUENIA JEFFREYSI	PIGGKUTLING
8850		SCOMBROIDEI	MAKRELLFISKER
885002		TRICHIURIDAE	TRÅDSTJERTFAMILIEN
88500202	ATLANTIC CUTLASSFISH	TRICHIURUS	TRÅDSTJERTER
8850020201	ATLANTIC CUTLASSFISH	TRICHIURUS LEPTURUS	TRÅDSTJERT
8850020301	BLACK SCABBARDFISH	APHANOPUS CARBO	DOLKFISK
8850020401	SILVER SCABBARD FISH	LEPIDOPUS CAUDATUS	SLIREFISK
885003	TUNAS	SCOMBRIDAE	MAKRELLFAMILIEN
8850030105	LITTLE TUNY	EUTHYNNUS QUADRIPUNCTATUS	TUNNIN
8850030202	BONITO	SARDA SARDA	STRIPET PELAMIDE
88500303		SCOMBER	MAKRELLSLEKTEN
8850030301	SPANISH MACKEREL	SCOMBER COLIAS	SPANSK MAKRELL
8850030302	MACKEREL	SCOMBER SCOMBRUS	MAKRELL
8850030402	BLUE-FIN TUNNY	THUNNUS THYNNUS	MAKRELLSTØRJE
8850030701	FRIGATE MACKEREL	AUXIS ROCHEI	AUXID
8850031201	PLAIN BONITO	ORCYNOPSIS UNICOLOR	USTRIPET PELAMIDE
885004	SWORD-FISHES	XIPHIIDAE	SVERDFISKFAMILIEN
8850040101	SWORDFISH	XIPHIAS GLADIUS	SVERDFISK
885005		LUVARIDAE	LUVARFAMILIEN
8850050101	LUVAR	LUVARUS IMPERIALIS	LUVAR
8851		STROMATEOIDEI	SVARTFISKER
885101	RUDDERFISHES	CENTROLOPHIDAE	SVARTFISKFAMILIEN
8851010301	BLACKFISH	CENTROLOPHUS NIGER	SVARTFISK
8851030401	CORNISH BLACKFISH	PALOMETA MEDIUS	ENGELSK SVARTFISK
8855	FLATFISHES	PLEURONECTIFORMES	FLYNDREFISKER
885703	LEFTEYE FLOUNDERS	BOTHIDAE	VARFAMILIEN
88570304		SCOPHTHALMUS	VARSLEKTEN
8857030402	TURBOT	SCOPHTHALMUS MAXIMUS	PIGGVAR
8857030403	BRILL	SCOPHTHALMUS RHOMBUS	SLETTVAR
88570317		ARNOGLOSSUS	TUNGEVARSLEKTEN
8857031702	SCALD FISH	ARNOGLOSSUS LATERNA	TUNGEVAR
8857031703	IMPERIAL SCALDFISH	ARNOGLOSSUS IMPERIALIS	KEISERVAR
8857031706	SPOTTED SCALDFISH	ARNOGLOSSUS THORI	FLEKKVAR
8857032101	COMMON TOPKNOT	ZEUGOPTERUS PUNCTATUS	HÅRVAR
88570322		PHRYNORHOMBUS	

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8857032201	NORWEGIAN TOPKNOT	PHRYNORHOMBUS NORVEGICUS	SMÅVAR
8857032202	EKSTROMS TOPKNOT	PHRYNORHOMBUS REGIUS	KONGEVAR
8857032302	MEGRIM	LEPIDORHOMBUS WHIFFIAGONIS	GLASSVAR
885704	RIGHTEYE FLOUNDERS	PLEURONECTIDAE	FLYNDREFAMILIEN
8857040502	WITCH	GLYPTOCEPHALUS CYNOGLOSSUS	SMØRFLYNDRE
8857040603	LONG ROUGH DAB	HIPPOGLOSSOIDES PLATESSOIDES	GAPEFLYNDRE
8857040904	DAB	LIMANDA LIMANDA	SANDFLYNDRE
8857041202	LEMON SOLE	MICROSTOMUS KITT	LOMRE
8857041402	FLOUNDER	PLATICHTHYS FLESUS	SKRUBBE
8857041502	EUROPEAN PLAICE	PLEURONECTES PLATESSA	RØDSPETTE
8857041801	GREENLAND HALIBUT	REINHARDTIUS HIPPOGLOSSOIDES	BLÅKVEITE
8857041902	HALIBUT	HIPPOGLOSSUS HIPPOGLOSSUS	KVEITE
8858		SOLEOIDEI	TUNGEFISKER
885801	SOLES	SOLEIDAE	TUNGEFAMILIEN
88580106		SOLEA	TUNGESLEKTEN
8858010601	SOLE	SOLEA VULGARIS	TUNGE
8858010610	SAND SOLE	SOLEA LASCARIS	SANDTUNGE
8858010801	SOLENETTE	BUGLOSSIDIUM LUTEUM	GLASSTUNGE
8858010903	THICKBACK SOLE	MICROCHIRUS VARIEGATUS	STRIPETUNGE
8859		TETRAODONTIFORMES	FASTKJEVETE FISKER
8860		BALISTOIDEI	AVTREKKERFISKER
886002	LEATHERJACKETS	BALISTIDAE	AVTREKKERFISKFAMILIEN
8860020205	TRIGGER FISH	BALISTES CAROLINENSIS	AVTREKKERFISK
886104	MOLAS	MOLIDAE	MÅNEFISKFAMILIEN
8861040101	SUNFISH	MOLA MOLA	MÅNEFISK
8899		VARIATUS PISCES	ANNEN FISK
9999	UNIDENTIFIED	INDETERMINATUS	UKJENT

5.1.4.1 NODC taxonomic code (version 7.0).

Level in hierarchy

	Level (English)	Level (Norwegian)
P	Phylum	Rekke
C	Class	Klasse
O	Order	Orden
F	Family	Familie
G	Genus	Slekt
S	Species	Art
V	Subspecies	Underart
" "	Blank e.g. (Subphylum, Superclass, Suborder)	

NODC taxonomic code (12 characters)
The code is entered into the square for species and prey in the forms, aligned left.

code	Level
xx	Phylum, Subphylum, Superorder
xxxx	Superclass, Class, Subclass, Superorder, Order, Suborder, Infraorder, Section, Superfamily
xxxxxx	Order, Suborder, Family, Subfamily
xxxxxxxx	Genus
xxxxxxxxxx	Species
xxxxxxxxxxxx	Subspecies, Variety

Examples:

SILD'G03 is coded as stock xxxxxxxxxx03 (Norwegian spring-spawning herring)
SILD'G05 is coded as stock xxxxxxxxxx05 (North Sea herring)
SILD'G07 is coded as stock xxxxxxxxxx07 (Trondheimsfjord herring, White Sea herring)
SILD'G14 is coded as stock xxxxxxxxxx14 (Romsdalsfjord herring)

5.1.5 Table 5. General description of maturity stages

Stage	Description
Blank	**Undecided/not checked**
1	**Immature** Gonads are small. No visible eggs or milt.
2	**Maturing** Gonads are larger in volume. Eggs or milt are visible but not running.
3	**Spawning** Running gonads. Light pressure on the abdomen will release eggs or milt.
4	**Spent/Resting** Gonads small, loose and/or bloody. Regeneration starting, gonads somewhat larger and fuller than stage 1. No visible eggs or milt.
5	**Uncertain** Use only when difficult to distinguish stages 1 and 4.

5.1.6 Table 6. Maturity stages used for capelin, herring, sprat, mackerel and horse mackerel

Stage	Females	Males
blank	**Undecided/not checked**	**Undecided/not checked**
1	**Immature a)** Juvenile phase. Gonads thread-like, thin and completely transparent and colourless. Difficult to determine sex.	**Immature a)** Juvenile phase. Gonads thread-like, thin and completely transparent and colourless. Difficult to determine sex.
2	**Immature b)** Gonads are somewhat larger in volume, sex is easier to determine. The gonads continue to be transparent and colourless with a hint of colour.	**Immature b)** Gonads are somewhat larger in volume, sex is easier to determine. The gonads continue to be transparent and colourless with a hint of colour.
3	**Maturing a)** Gonads opaque but developed in volume. Distinct veins. Ovaries have yellow/white eggs in lamellae and can occupy half of the body cavity or more.	**Maturing a)** Gonads opaque but developed in volume. Distinct veins. Testes white or with white spots. Firm consistency.
4	**Maturing b)** Gonads larger in volume Distinct veins. Ovaries yellowish or white, can occupy 2/3 or more of the body cavity depending on the condition of the fish. The eggs can be seen distinctly and feel like grain. The eggs in the front part of the gonad are beginning to become transparent.	**Maturing b)** Gonads larger in volume. Distinct veins. Testes light grey or white, milt thick and slow-flowing.
5	**Maturing c)** Ovaries fill the entire body cavity. Most of the eggs are transparent.	**Maturing c)** Testes are grey or white. The milt runs easily. Gonads are not yet running, however, a light pressure on the abdomen causes the milt to run.
6	**Spawning** Running gonads. A light pressure on the abdomen causes the eggs to run.	**Spawning** Running gonads. A light pressure on the abdomen causes the milt to run.
7	**Spent** Gonads loose, contain remaining eggs.	**Spent** Gonads loose, contain remaining milt.
8	**Resting** Gonads are small. Eggs are not visible. Difficult to distinguish from stages 2/ 3.	**Resting** Gonads are small. Eggs are not visible. Difficult to distinguish from stages 2/ 3.

5.1.7 Table 7. Maturity stages used for blue whiting and greater silver smelt

Stage	Females	F	Males	F
blank	**Undecided/not checked**		**Undecided/not checked**	
1	**Immature** Ovaries transparent and white. No visible eggs.	<1/4	**Immature** Testes are thin and transparent. «Ribs» almost invisible.	<1/4
2	**Spent (new maturation) + First-time spawner** Ovaries transparent orange/red, somewhat spotted	1/3	**Spent (new maturation) + First-time spawner** Testes transparent pink/white, with some rolls or loops	1/2
3	**Maturing** Ovaries orange/pink. Opaque eggs barely visible.	1/2	**Maturing** Testes are in the process of becoming opaque pink/whit. Some blood vesssels with «bags». Curl when squeezed.	2/3
4	**Maturing** Ovaries harder orange/pink. Opaque eggs distinctly visible.	2/3	**Maturing** Testes opaque, white, plump.	3/4
5	**Maturing/mature** Ovaries orange/pink. Some hyaline eggs.	>3/4	**Maturing/mature** Testes opaque creme-white. Tightly curved bags or rolls.	1
6	**Spawning/running** Ovaries pink/white. Mainly hyaline eggs. Easy to squeeze out.	1	**Spawning/running** Testes opaque creme-white. Easy to squeeze out.	1
7	**Spent** Ovaries spotted pink/red, bloody. Some eggs remaining.	<1/2	**Spent** Testes yellow-white and bloody. Small crinkled band.	<3/4

F = Gonad length in relation to body cavity size.

5.1.8 Table 8. Maturity stages used for demersal fish

FEMALES:

Stage	Description	When most common
blank	**Undecided/not checked**	
1	**Immature** Small, reddish, clear gonads.	All year
2	**Maturing** Only small eggs, none clear. All sizes.	November, December, January
3	A few clear eggs	February, March
4	Many clear eggs	February, March, April
5	**Running** Spawning. All eggs clear.	March, April, May
6	**Spent** Bluish shrunken gonads, can also have other colours. Can be difficult to distinguish from stage 1.	May, June, July, August, September
7	**Spent/maturing** New eggs are being formed.	October, November
8	**Uncertain** Use particularly when uncertain whether stage 1 or 6.	

MALES:

Stage	Description	When most common
blank	**Undecided/not checked**	
1	**Immature** Thin string	All year
2	**Maturing** May be squeezed into small pieces by hand. Thick milt, whitish.	November, December, January
3	May be squeezed into pieces. Slow-flowing milt, white.	February, March February, March, April
4	May be squeezed, but milt more easy-flowing, white.	March, April, May
5	**Running milt** Spawning, white.	
6	**Spent, blue/red** String with knots.	May, June, July, August, September
7	**Spent and maturing** String with knots. Beginning to be white or reddish close to the string.	October, November
8	**Uncertain** Use particularly when uncertain whether stage 1 or 6.	

5.1.9 Table 8b. Spesial stages for Greenland halibut

FEMALE:

Code	Description
1	**Immature**. Ovaries very small, eggs not visible by the naked ege.
2	**Maturing (A)**. Eggs visible by the naked eye.
3	**Maturing (B)**. Eggs have a diameter of 1-2mm.
4	**Maturing C)**. Diameter of eggs 2-4mm. Eggs are translucent, but slightly tinted. (translucent), slightly coloured.
5	**Spawning**. Eggs are translucent, transparent and large(ca 4-5mm). Running.
6	**Post-/Spent.** Ovaries are reddish and slack.Residual eggs may be present, transparent or opaque some gonads may appear without the red color, but are slack with thick ovary partitions, and with a hollow in the middle of it. Uncertailty between stages 6 og 1, impossible to distinguish from. Immature/spent/resting.
7	

5.1.10 Table 9. Maturity stages used for redfish

(last updated August 19 1988)

FEMALES:

Stage	Description
blank	**Undecided/not checked**
1	**Immature** Ovaries barely translucent or yellow without distinct eggs.
2	**Maturing** Ovaries relatively firm with golden yellowish and opaque eggs..
3	Ovaries slack with loose yellowish and translucent eggs (i.e. eggs have been fertilised).
4	Embryo (larva) clearly visible inside the egg.
5	**Spawning** Egg membrane broken and larvae loose.
6	**Spent** Ovaries large, loose, purple, red or firm, grey or pink.
7	**Uncertain**

MALES:

Stage	Description
blank	**Undecided/not checked**
1	**Immature** Translucent or white, thin strings.
2	**Maturing** Testes large, swollen, round and white. Milt runs when testes are cut into.
3	Mating; testes thinner. Sperm runs freely when body is lightly pressed. Sexually inactive; testes often triangular and brownish.
4	Milt not running even when testes are cut into.
5	**Uncertain**

5.1.11 Table 10a. Maturity stages (only +) for king crab.

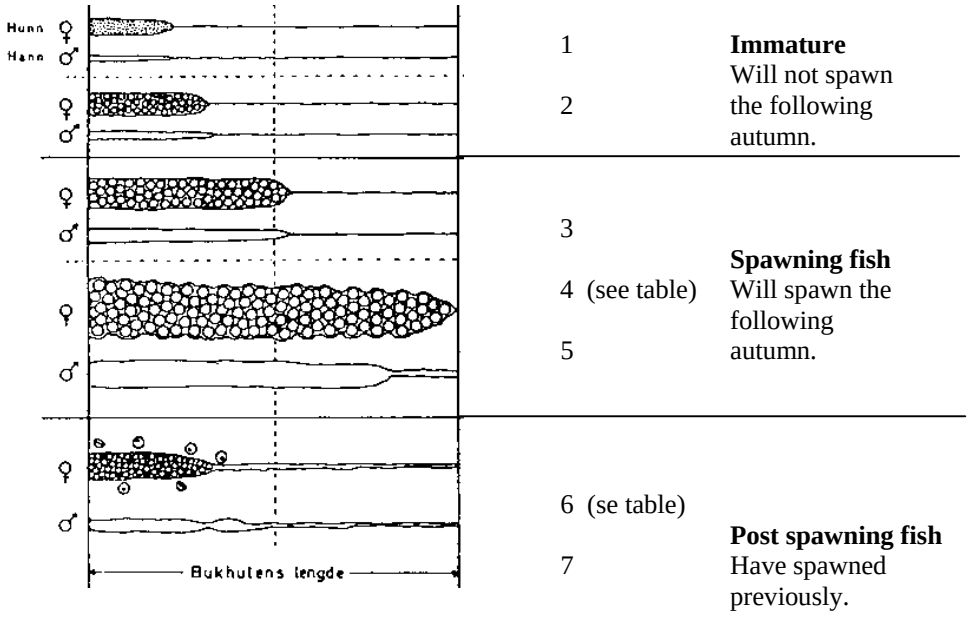
Stage	Description
blank	Not observed/not checked.
1	New eggs, blue/purple colour, 1-2 brownish eggs.
2	Embryonal eyes (eye roe) visible - second half of year cycle.
3	Empty eggshells after hatching.
4	No eggs under abdomen, or there can be some unfertilised eggs, crab is mature.

5.1.12 Table 10b. Moulting stages for king crab.

Stage	Description
blank	Not observed/not checked.
1	New soft carapax without algae growth. Legs are white without scratches.
2	Hard carapax, but without algae growth. Coxa are white-light yellow without scratches.
3	(Early) carapax hard, with some algae growth, yellow-light brown coxa with scratches.
4	(Late) carapax hard, with algae growth, light brown-brown coxa with many scratches.
5	Carapax yields when pressed, overgrown with large barnacles, coxa dark brown with many scratches.

5.1.13 Table 11. Maturity stages for salmon, trout and rainbow trout.

Sexual development in salmon, trout and rainbow trout. The size of the gonads are indicated in relation to the length of the abdominal cavity.
Please note:
For salmon, trout and rainbow trout the codes 1-7 are used, where 1-2 are immature stages, 3-5 are fish that will spawn the following autumn, while 6-7 are spawning or postspawning fish. Stage 6 is most probably only encountered in rivers, but can be found in escaped farm fish in fjords and coastal areas.



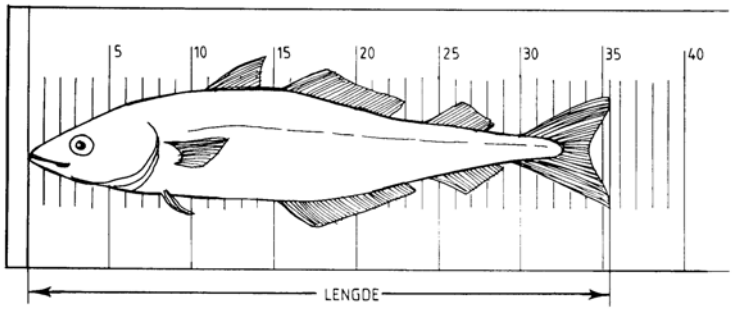
1		**Immature** Will not spawn the following autumn.
2		
3		**Spawning fish** Will spawn the following autumn.
4	(see table)	
5		
6	(se table)	**Post spawning fish** Have spawned previously.
7		

See description next page.

Sex	**Stage**	Description of gonad
If stages 1-2 are registered in May-October, the fish are immature and will not spawn the coming autumn.		
Female	1	Length <20 % of the length of abdominal cavity. Invisible or barely visible roe. Colour light yellow/orange.
Male	1	Length <20% of the abdominal cavity. Barely visible expansion of testes. Semi-transparent and whitish.
Female	2	Length 25-30% of abdominal cavity. Visible small eggs. Colour yellow-orange.
Male	2	Filling 25-30 % of cavity, whitish colour in the expanded area.
Stages 3-5 will spawn the following autumn.		
Female	3	The length of the ovaries corresponds to 50 % of the cavity, visibly expanded, visible eggs.
Male	3	Testes correspond to 50 % of length of cavity, visibly expanded, whitish colour.
Female	4	Length of ovaries corresponds to 60-80 % of cavity. Visibly expanded roe. Colour strong but opaque orange.
Male	4	Length of ovaries corresponds to 60-80 % of cavity. Visibly, whitish opaque color.
Female	5	Ovaries fill almost the whole abdominal cavity; well developped roe. Colour strong orange, roe almost transparent.
Male	5	Testes fill almost the whole cavity; strongly expanded in width; Colour white opaque.
Female	6	Ovaries fill the whole cavity, run when pressed lightly.
Male	6	Testes fill the whole cavity, run when pressed lightly.
Stage 7 is postspawner or dwarf male.		
Female	7	May resemble stage 2, but has normally shrunken loose eggs in the belly around the ovaries.
Male	7	Testes slack, somewhat expanded, filling up to 50 % of cavity, whitish opaque, often with extravasations arond the membrane.

Title:	Version:
Manual for sampling of fish and crustaceans, Appendices, Figurs	1.0

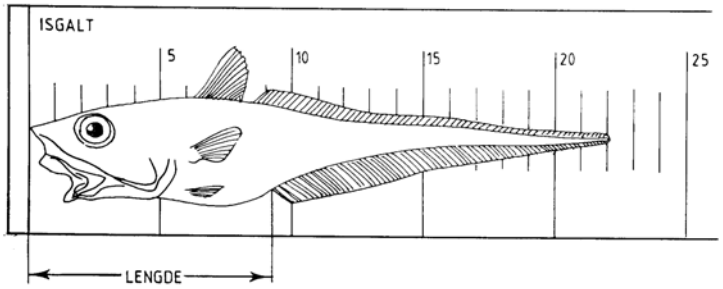
5.2 Figures



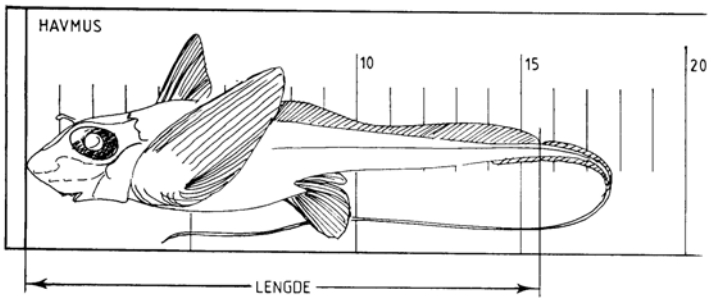
FORK LENGTH, from snout to the deepest angle of the tail, (code I).

STANDARD LENGTH, from snout to bony knot in tail.

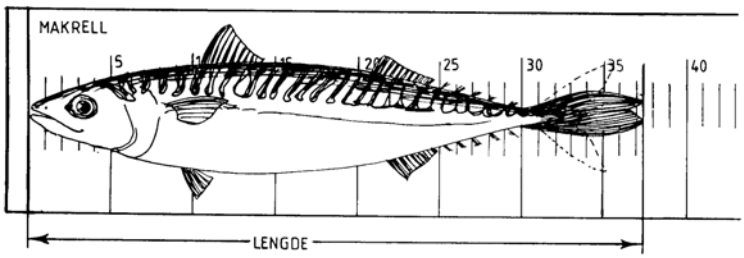
ALL OTHER SPECIES are measured from snout to the end of tail when in natural position (code E).



ROUGH RATTAIL/ ROUNDNOSE GRENADIER measured from the snout to the first ray of the anal fin (code G).



RATFISH/CHIMAERA measured from snout to the end of the first dorsal fin (code H).



MACKEREL measured from the snout to the end of tailwhen pressed together (code F).

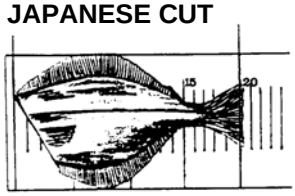
5.2.1 Fig. 1. Length measurements of fish (standard measures)

Title: **Manual for sampling of fish and crustaceans, Appendices, Figurs**	Version: 1.0

HEAD LENGTH

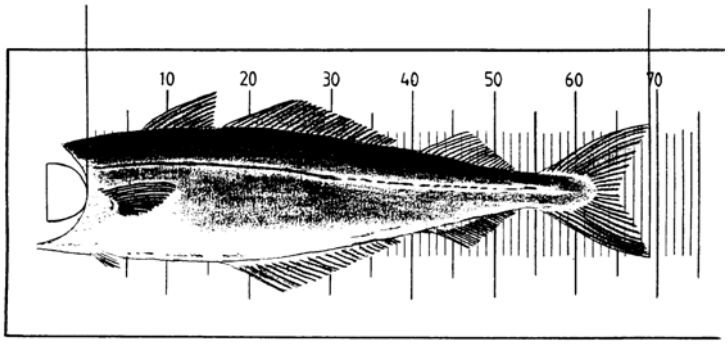
HEAD LENGTH, length measured from the snout to the end of the jaw bone (code D).

JAPANESE CUT



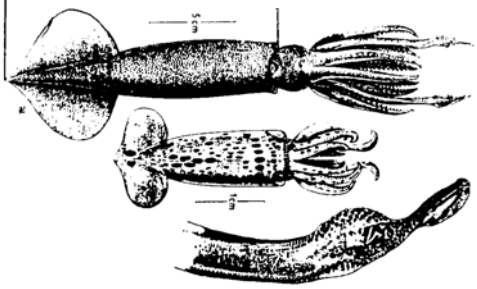
JAPANESE CUT, length measured as shown in drawing (code R).

HEAD CUT LENGTH

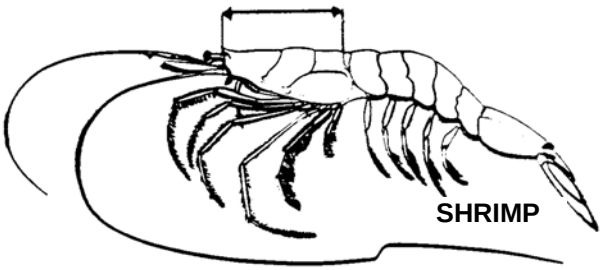


HEAD CUT LENGTH, length measured as shown in drawing.

GONATUS



SQUID (GONATUS FABRICI) mantle length measured (code B).

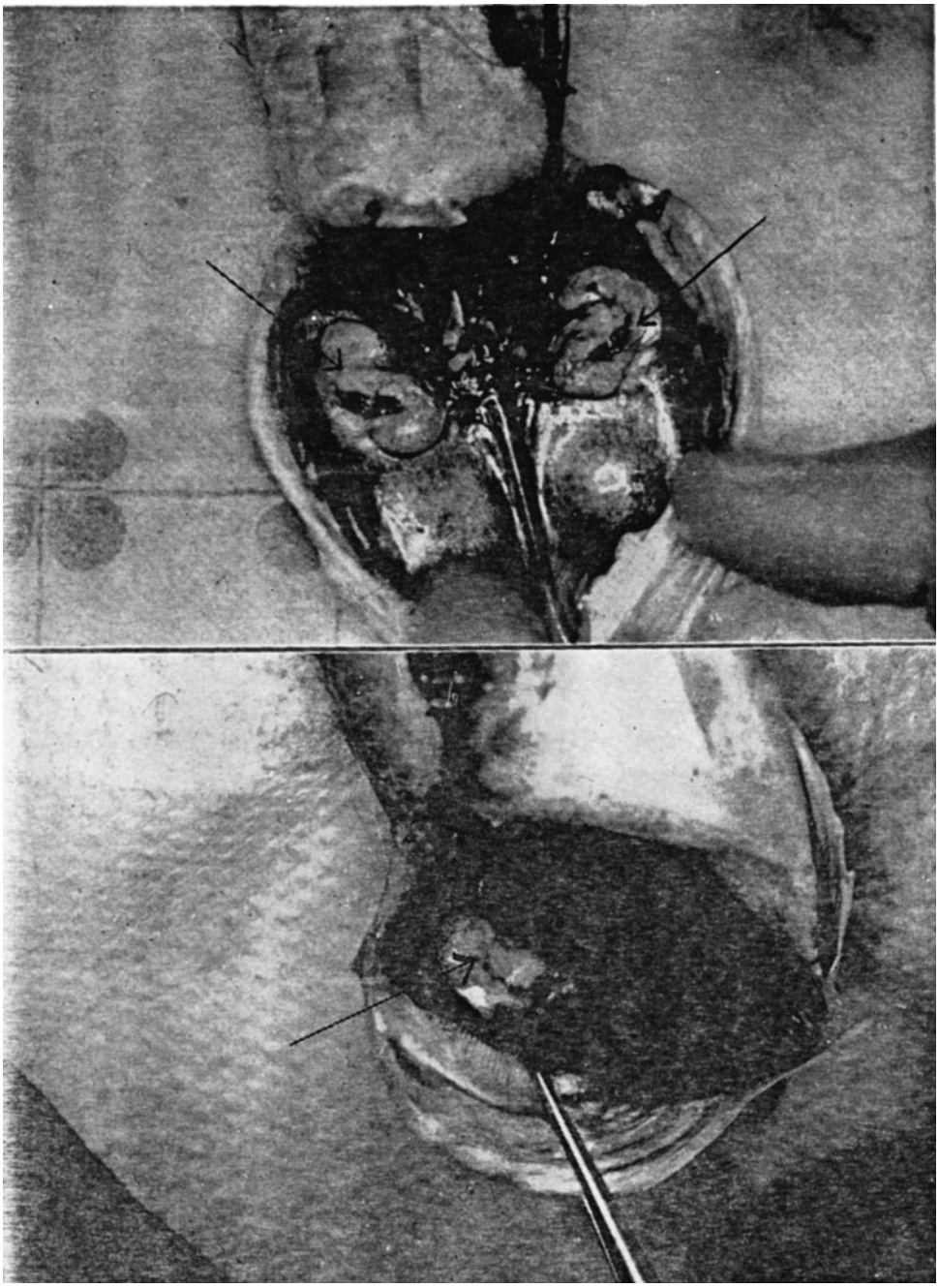


SHRIMP, carapax length measured from the end of the eye opening to the anterior dorsal edge of carapax (code C)

5.2.2 Fig. 2. Length measurement of fish and invertebrates

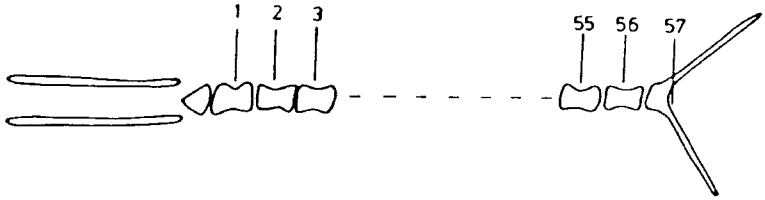
a

b

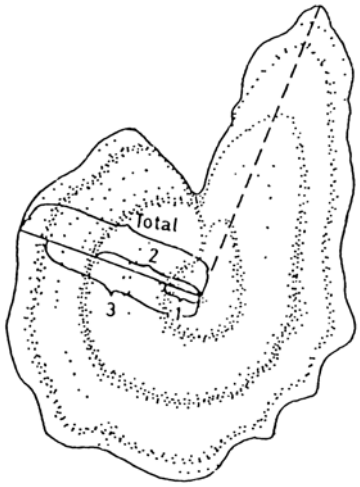


5.2.3 Fig. 3. Pseudobranchial tumor in blue whiting

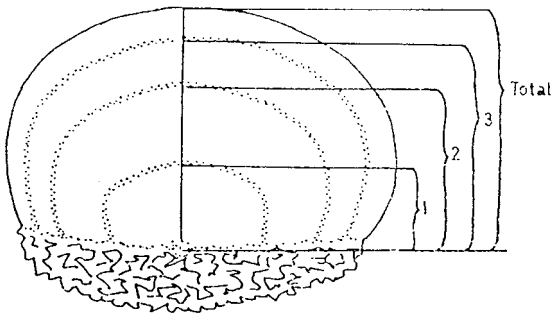
a) seen from below
b) seen from the side.
The tumor is indicated by the arrows.



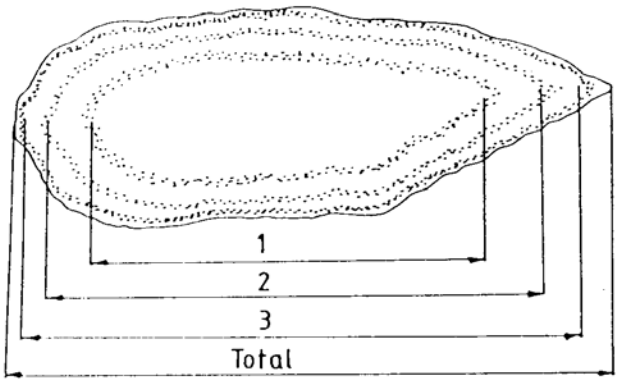
5.2.4 Fig. 4. Vertebral counts



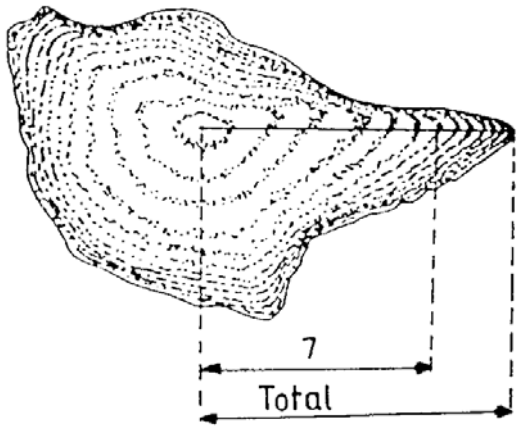
5.2.5 Fig. 5. Capelin otolith



5.2.6 Fig. 6. Herring scale



5.2.7 Fig. 7. Blue whiting/ Polar cod otoliths

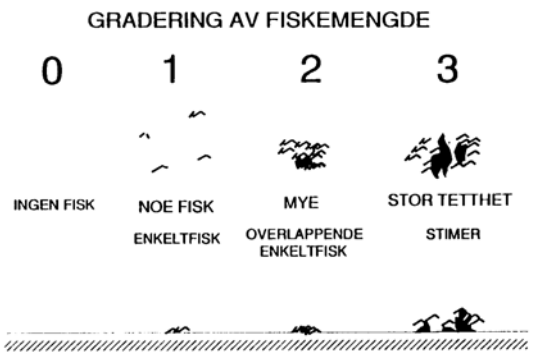


5.2.8 Fig. 8. Greater Argentine otolith

For the time period 1989-93 special codes for fish quantity and fish distribution were used during the annual «so-called cod adventure survey». The values indicate quantity and distribution of cod and haddock.

5.2.9 Fig. 9 Fish abundance

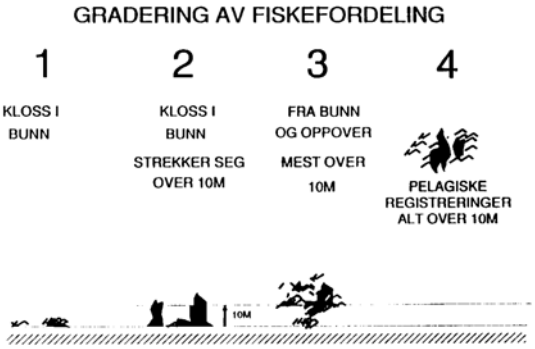
Fish abundance (S:98): The relative degree of abundance is coded in column 98 according to the following scale.



No fish	0
Some fish, single fish	1
Many and overlapping single fish	2
High densities, schools	3

5.2.10 Fig. 10 Fish distribution

Fish distribution (S:99): The relative degree of abundance is coded in column 99, according to the following scale:



No fish	0
Close to bottom	1
Close to bottom, up to 10 m	2
From the bottom and upwards, surpassing 10 m.	3
Pelagic registrations, everything above 10m.	4

5.3 Forberg-stages

See illustrated instructions

5.3.1 Class I (10) - immature (100X magnification) Fig. 1 and 2,

see next page.

The eggs are translucent and often transparent enough to show the vacuoles of the nucleus. There are none or extremely few yolk vacuoles in the cytoplasm. The eggs can be round (the largest), oval or angular (the smallest), and are found in all sizes from 0.005 mm to 0.2 mm.

Capelin in class I are found year-round (capelin ≤ 10 cm). Eggs in the state described above are found in the ovary tissue of all capelin, year-round and irrespective of maturity stage as such. They are referred to as resting or reserve eggs and are eggs in the first phase of growth. Ovaries are thin and colourless.

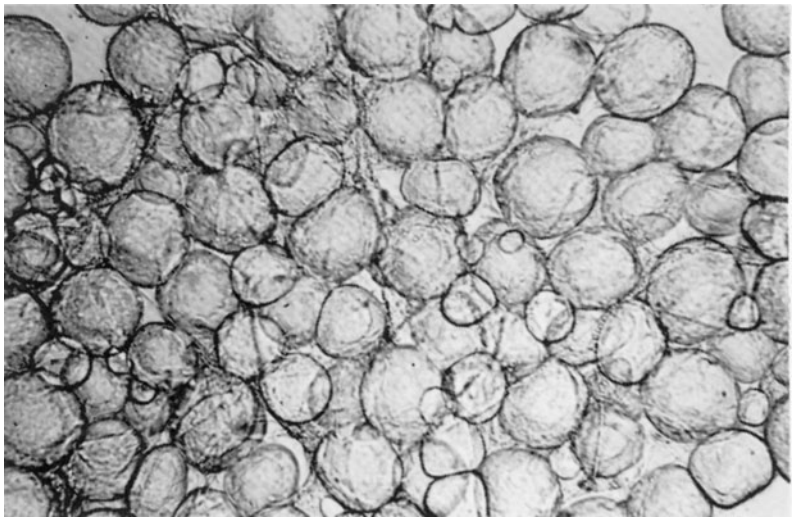


Fig 1. Class I (10) - immature
Approx. 50X mag. (1/5-74, 11.2 cm, 3 yr)

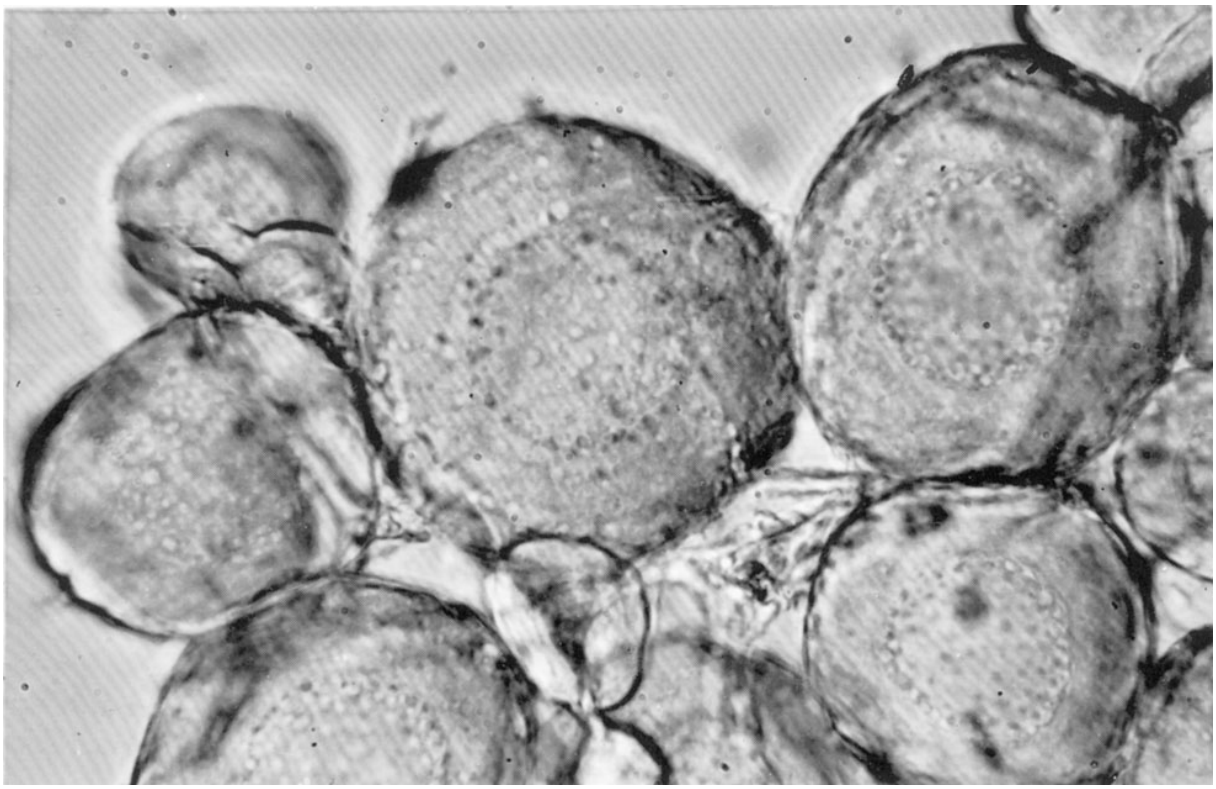


Fig 2. Class I (10) - immature
Approx. 300X mag. (29/11-73, 12.4cm, 3 yr)

5.3.2 Class IIa (21) - early maturing I (100X magnification) Figs. 3 and 4

More than 10% of eggs 0.15 mm in diameter have the following characteristics: round, clear yolk vacuoles (granuoles) are found spread throughout the cytoplasm. The eggs are clear and translucent and some are transparent. They are completely round, measuring approx. 0.15 - 0.20 mm in diameter. These eggs have begun the next growth phase and will grow to mature size (approx. 1.0 mm) within one year. They constitute approx. 16 - 30% of all eggs 0.02 mm in diameter.

Fish in class IIa are found in both summer and fall and occasionally in spring. This is because there are summer spawners (class IIa in autumn and winter) and winter spawners (class IIa in the summer/autumn) and because the fish spend a relatively long time in this stage. Ovaries are thin and colourless or slightly opaque. Less than 10% of the eggs in this growth phase have the characteristics described for class IIb.

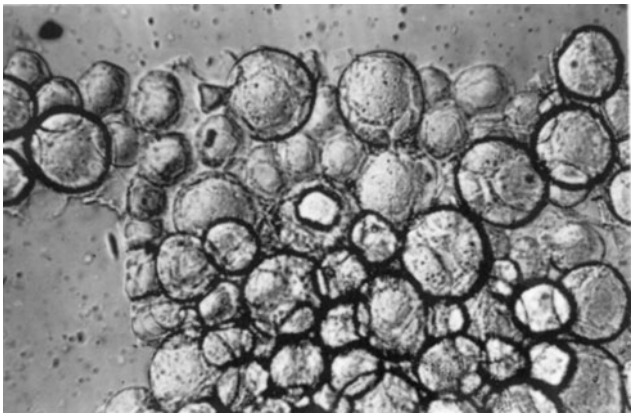


Fig 3. Class IIa (21) - early maturing I.
Approx. 50X mag. (26/10-74, 12.0cm, 2 yr)

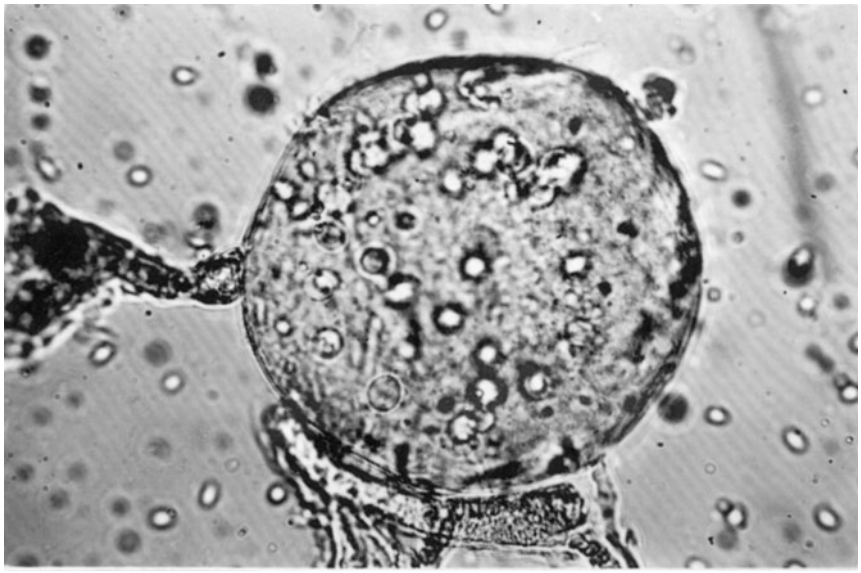


Fig 4. Class IIa (21) - early maturing I.
Approx. 300X mag. (24/6-74, 15.8 cm, 3 yr)

5.3.3 Class IIb (22) - early maturing II (100X magnification) Fig. 5

More than 10% of the eggs in this second growth phase are described as having the following characteristics: round, clear yolk granules dense throughout the whole egg. Eggs are approx. 0.2-0.3 mm in diameter.

Fish in class IIb are found in July/August (winter spawners) and in August/November (summer spawners). Ovaries are thin and colourless or slightly opaque. Less than 10% of the eggs in this growth phase have the characteristics described for class IIIa.

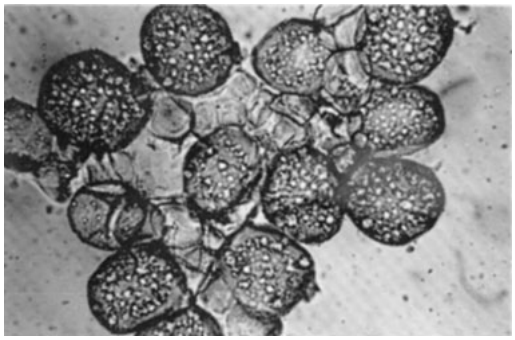


Fig 5. Class IIb (22) - early maturing II.
Approx. 50X mag. (26/10-74, 14.0 cm, 3 yr)

5.3.4 Class IIIa (31) - mature (50-100X magnification) Figs. 6 and 7,

see next page.

More than 10% of the eggs in the second growth phase described for class IIb have the following characteristics: the same structure as for class IIb is seen in the eggs. In addition one or two distinct, dark spots (fat vacuoles) are found in the cytoplasm. The size distribution of mature eggs in class IIIa from the size distribution of resting eggs and measure approx. 0.2 -0.35 mm in diameter.

Fish in this class are normally found in September/October (winter spawners). Ovaries may have a pale grey or pink colour, and one can detect an increase in growth in relation to ovaries in class I - II. Less than 10% of the eggs in the second growth phase have the the characteristics described for class IIIb.

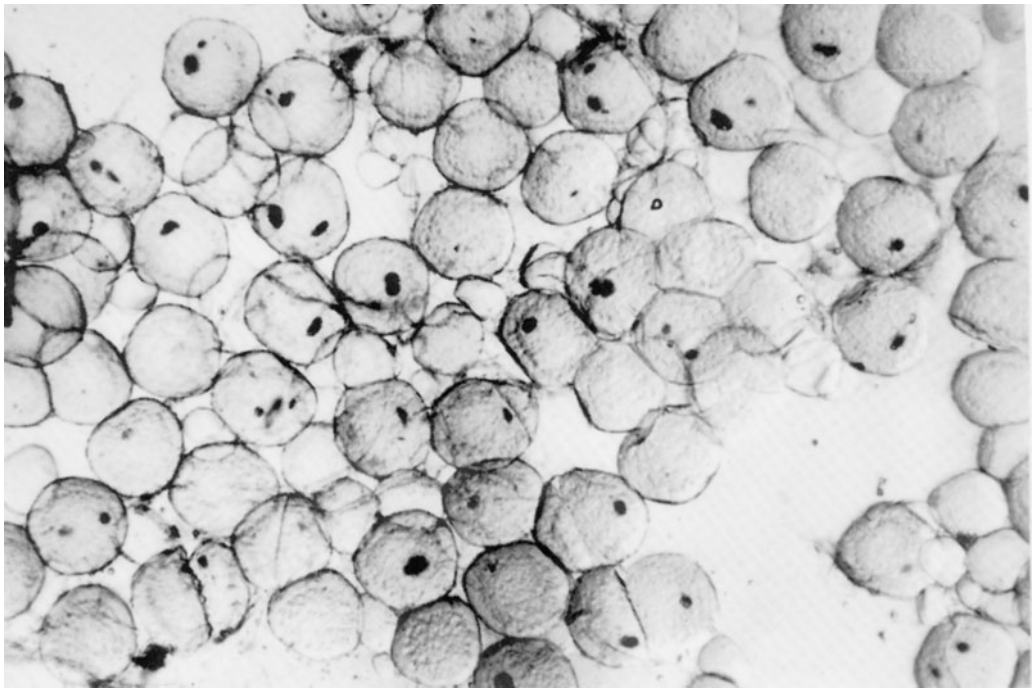


Fig 6. Class IIIa (31) - maturing I.
Approx. 45X mag. (24/6-74, 15.4 cm, 3 yr)

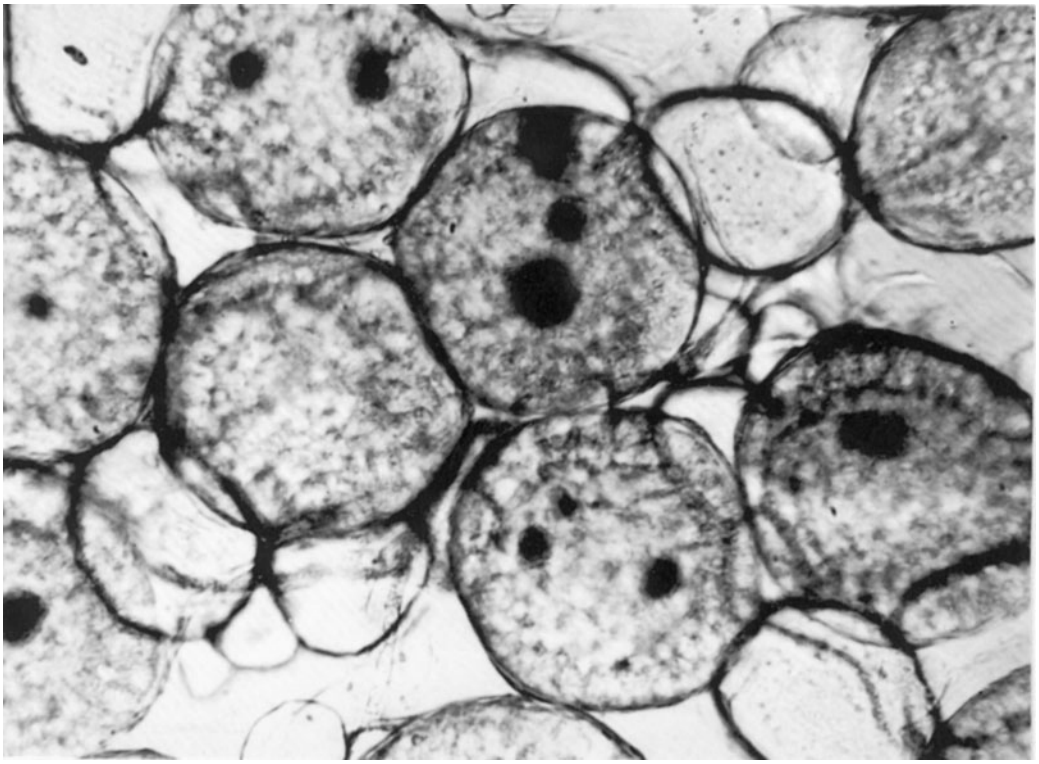


Fig 7. Class IIIa (31) - maturing I.
Approx. 150X mag. (24/6-74, 15.4 cm, 3 yr)

5.3.5 Class IIIb (32) - Maturing II (40-100X magnification) Fig. 8.

More than 10% of the eggs in the second growth phase described for class IIIa have the following characteristics: a dark belt forms a half moon or a near complete circle around the nucleus. There are fat vacuoles in the process of encircling the nucleus. Translucent cytoplasm can still be observed in the centre and along the membrane of the egg and in a sector of the egg where fat vacuoles have not yet been developed. The eggs measure approx. 0.3-0.4 mm in diameter.

Fish in class IIIb are found in September/November (winter spawners). Ovaries are pale grey or pink. Less than 10% of the eggs in the second growth phase have the characteristics described for class IIIc.

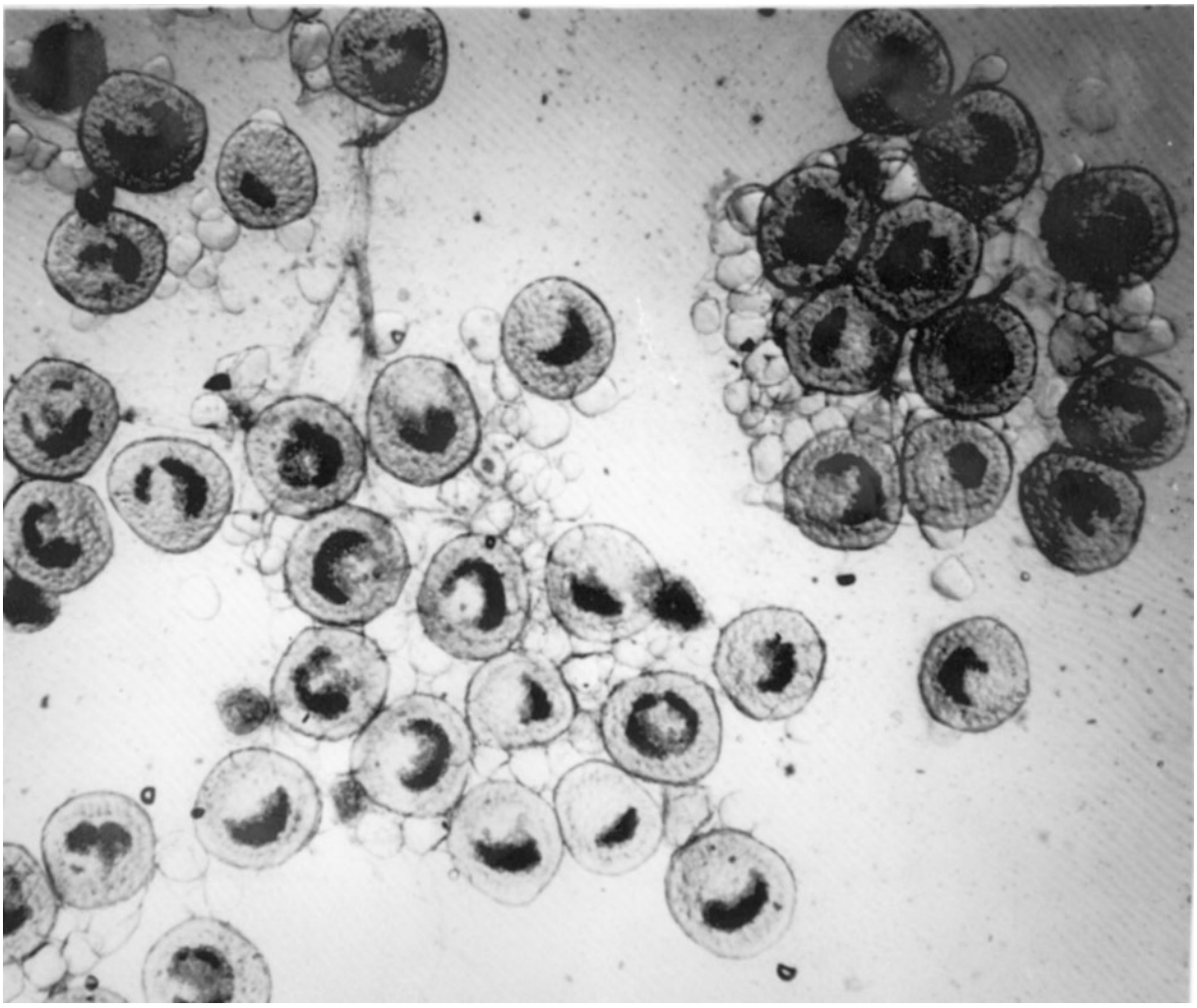


Fig 8. Class IIIb (32) - maturing II.
Approx. 45X mag. (7/10-74, 15.1 cm, 3 yr)

5.3.6 Class IIIc (33) - maturing III (40 - 100X magnification) Fig. 9.

More than 10% of the eggs in the second growth phase described for class IIIb have the following characteristics: nearly the whole egg is filled with not translucent fat vacuoles. The egg is translucent only in a thin layer along the egg membrane and occasionally in a small area in the centre. The eggs measure approx. 0.35-0.5 mm in diameter.

Fish in class IIIc are most often found in October/November (winter spawners). The ovaries are lightly tinged with yellow or yellow-red and are distinctly larger in volume than immature ovaries. Less than 10% of the eggs in the second growth phase have the characteristics described for class IV.

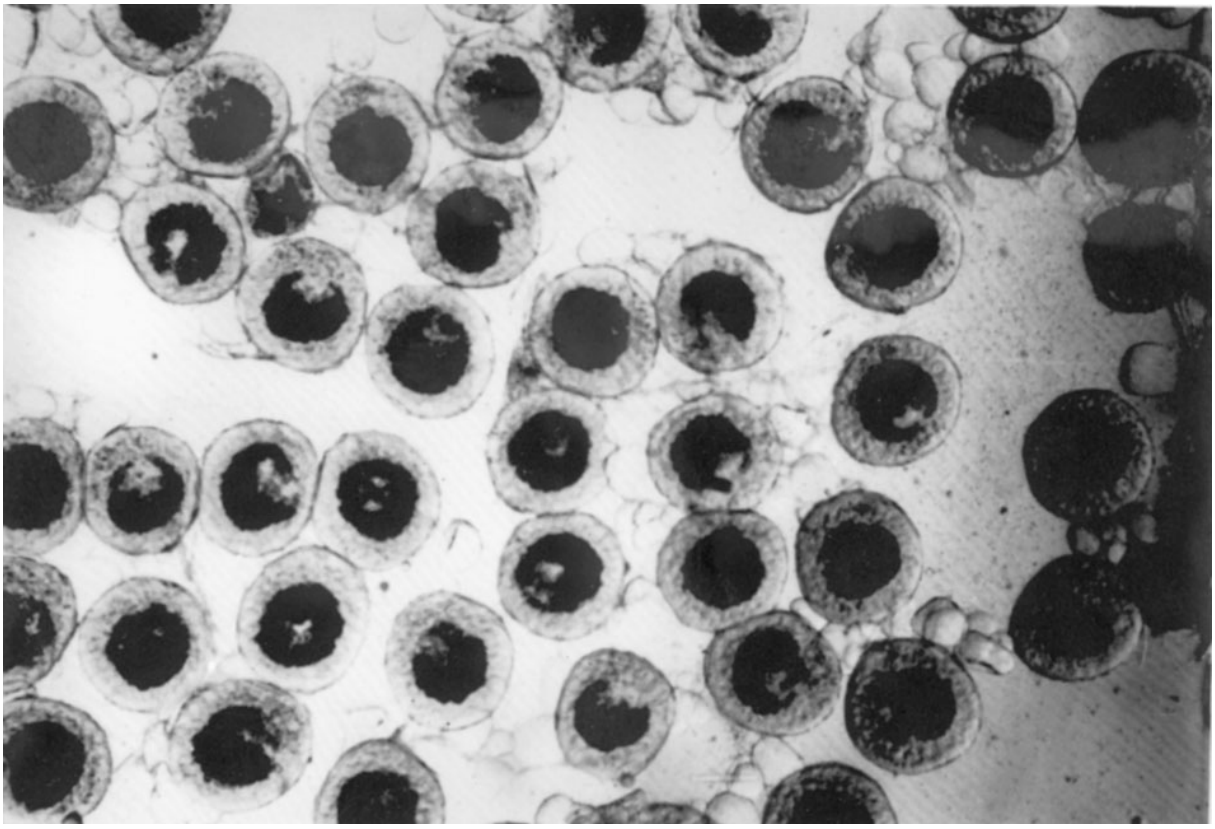


Fig 9. Class IIIc (33) - maturing III.
Approx. 40X mag. (6/10-74, 14.2 cm, 3 yr)

5.3.7 Class IV (40) - rapidly maturing (40X magnification) Figs. 10, 11 and 12.

More than 10% of the eggs in the second growth phase described for class IIIc have the following characteristics: the eggs are commonly not translucent - from the centre to the periphery. The most mature in this class have some translucent eggs, mostly in the centre and periphery, and vacuoles of varying sizes can be seen. The most important difference from class IV to V is that the eggs are still attached to the follicles so that most of the eggs stick to the roe when it is lifted with tweezers out of the belly by the basic roe tissue. The eggs measure from 0.45-0.85 mm in diameter depending on the time of year.

Fish in class IV are found from October to February/March. Ovaries are yellow-coloured and rapidly become the largest organ in the abdominal cavity. Less than 10% of the eggs in the second growth phase have the characteristics described for class V.

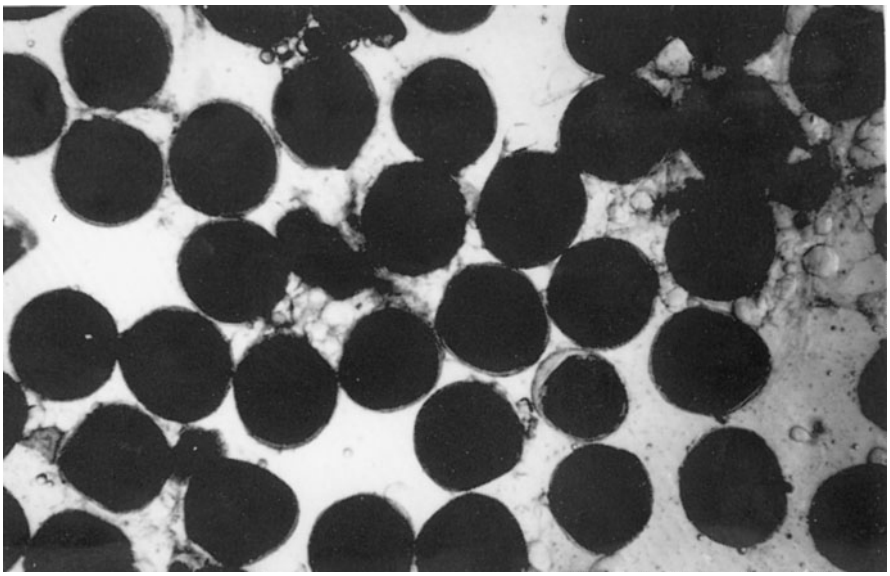


Fig 10. Class IV (40) - rapidly maturing
Approx. 20X mag. (26/11-73, 17.0 cm, 4 yr)

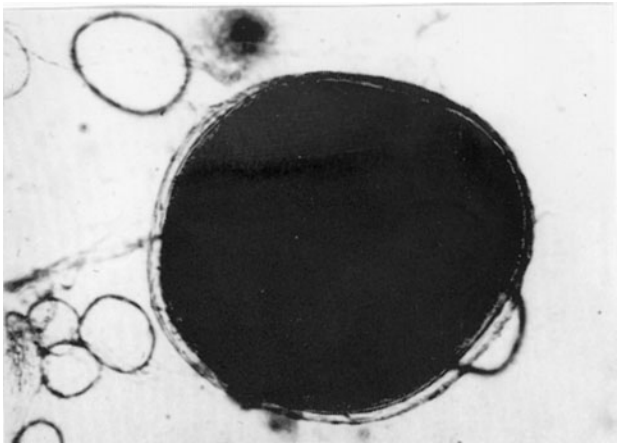


Fig 11. Class IV (40) - rapidly maturing
Approx. 70X mag. (20/1-74, 15.2 cm, 4 yr)

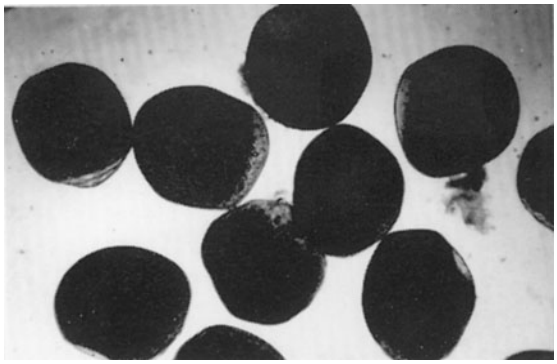


Fig 12. Class IV (40) - rapidly maturing
Approx. 20X mag. (12/3-74, 13.0 cm, 3 yr)

5.3.8 Class V (50) - mature (20-40X magnification) Figs. 13 and 14.

More than 10% of the eggs in the second growth phase described for class IV have the following characteristics: the eggs are partially translucent, especially at the periphery and in the centre. They are yellowish and contain many vacuoles. The fecundation pore - the mikrophyl - can be observed as a slight dent in the egg membrane. One pole of the egg (the vegetative pole opposite the microphyl) have a stronger pigmentation in the membrane than the opposite pole (the animal pole). The eggs are now floating freely in the body cavity (ovulated) or they are hanging very loosely onto the follicles, so that very few eggs are left in the basic roe tissue when it is lifted out of the belly by tweezers. The eggs are ready for spawning, but it is probable that capelin is able to carry mature eggs for at least one month before the actual spawning. By looking at small eggs - taken from the roe tissue - we may find out if a new secretion of eggs - from the first to the second growth phase - has started. The mature eggs fill up and expand the belly, and makes up approx. 20-25% of the total volume of the fish. The eggs run easily when the belly is squeezed.

Winter spawners in class V are found from January to April.

5.3.9 Class VI (60) - spawning (20-40X magnification) Figs. 13 and 14,

see next page.

The same characteristics as for stage 50, but the abdominal cavity is slightly shrunk because it is partially empty of eggs. The eggs of capelin mature synchronously and they spawn over a very short time period (probably a few hours). Therefore class VI will seldom be observed in the fish samples. Many cases of «spawning fish» will probably be mature fish (class V) which have been squeezed and emptied of eggs during capture/sampling. Class VI fish are found in March/ April (winter spawners).

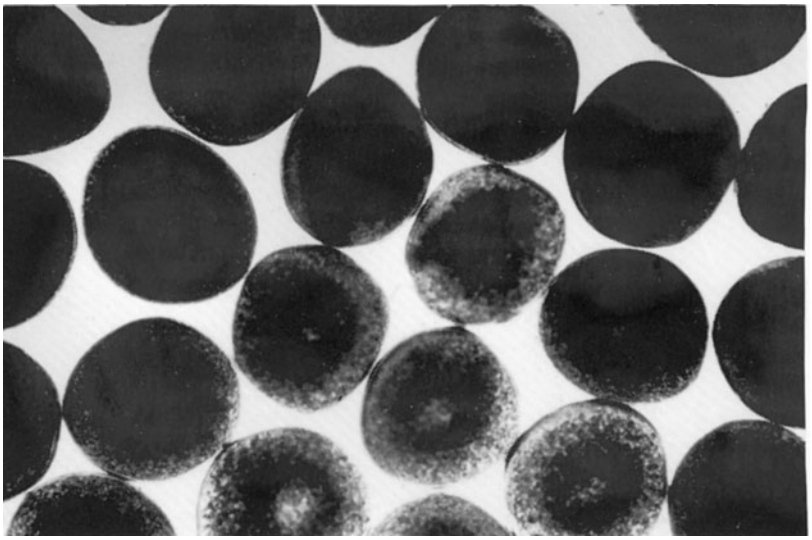


Fig 13. Class V (50) - mature
Approx. 20X mag. (12/3-74, 16.0 cm, 5 yr)

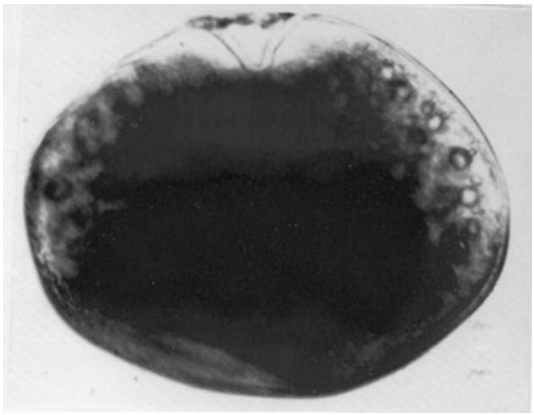


Fig 14. Class V (50) - mature
Approx. 55X mag. (14/4-75, 16.5 cm, 4 yr)

5.3.10 Class VII (70) - spent (100X magnification) Fig. 15.

A few mature or maturing eggs can be found in the ovary or loose in the body cavity. These small eggs have the same characteristics as those described for class I. Between these eggs are found numerous empty shrunk follicles indicating that spawning recently has taken place. The follicles can look like irregular or degenerate eggs. The tissue is especially bloody, and the veins are thick compared to the ovaries of fish in class I. The follicles have either degenerated or disappeared, but up until approx. two months after spawning class VII can be registered.

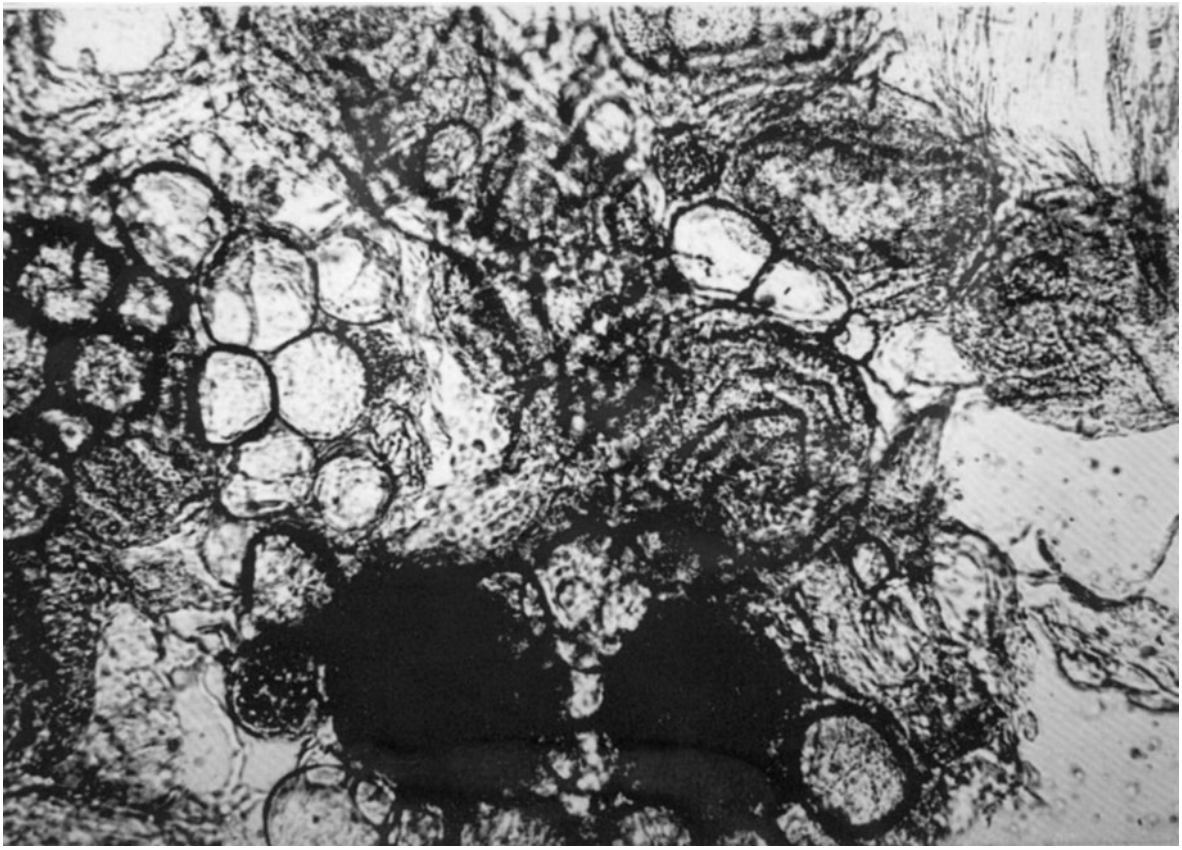


Fig 15. Class VII (70) - spent
Approx. 75X mag. (1/4-74, 14.4 cm, 4 yr)

5.3.11 Class VIII (80) - spent/early maturing (100X magnification).

Characteristics of eggs are as described for class II, and empty follicles are as described for class VII. The fish can pass directly from class VI to VIII.

5.3.12 Class IX (90) - degenerate (40-100X magnification) Fig. 16.

The eggs have characteristics which outwardly are the same as those described for the classes above. They may be shrunk, surrounded by a circular transparent film (chorion), or they may be transparent with large yellow vacuoles, or have other unusual characteristics. There will always be some degenerate eggs, but class IX should only be referred to when more than 50% of the eggs are degenerate. As a rule, only eggs in the second growth phase are degenerate. If it is possible to recognise which class the fish belonged to before degeneration started, the following sub-classification may be used.

Class IXa	(91):	degenerate fish in class I.
Class IXb	(92):	degenerate fish in class II.
Class IXc	(93):	degenerate fish in class III.
Class IXd	(94):	degenerate fish in class IV.
Class IXe	(95):	degenerate fish in class V.
Class IXf	(96):	degenerate fish in class VI.
Class IXg	(97):	degenerate fish in class VII.

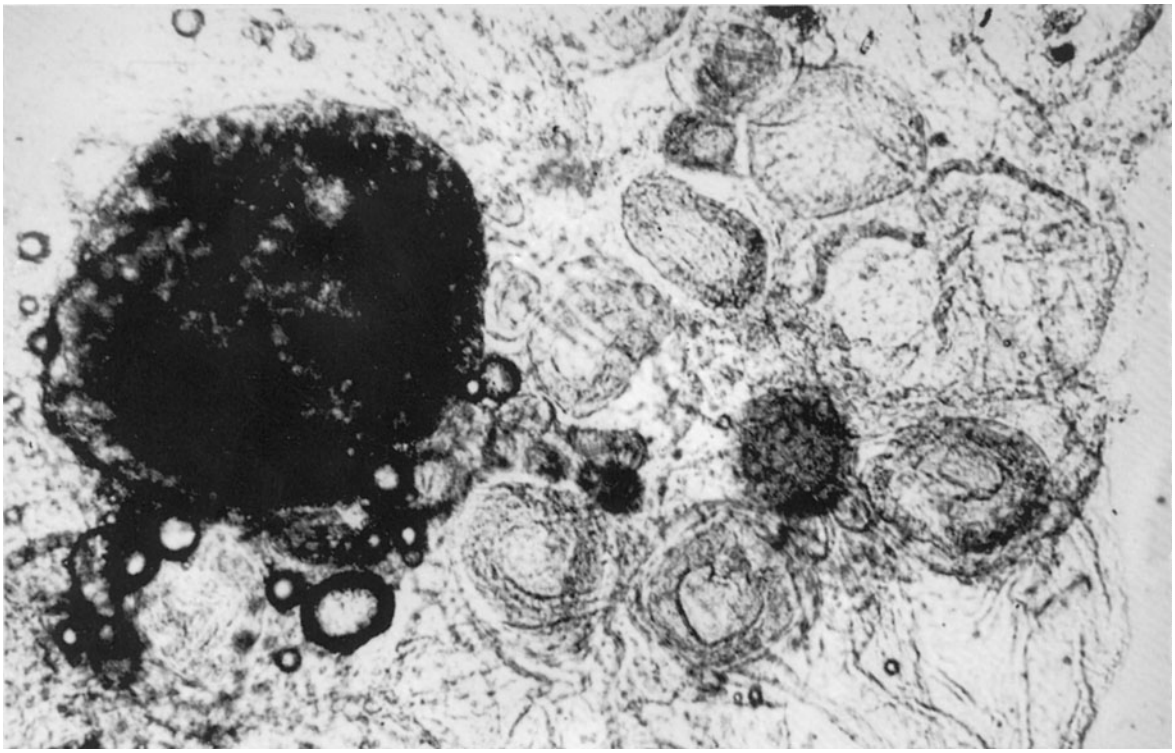


Fig 16. Class IX (90) - degenerate.

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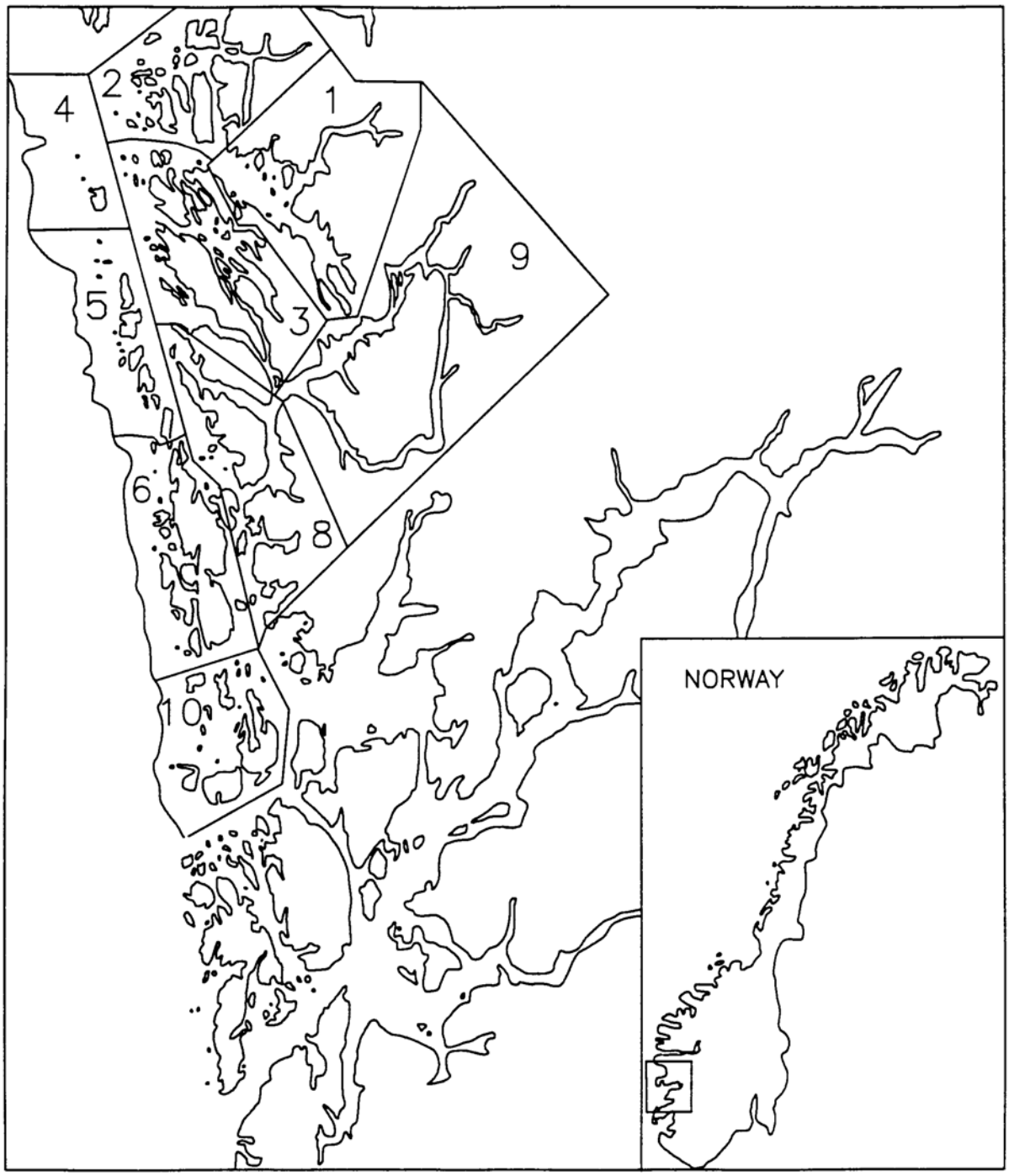
5.4 Region map

System 1, release of cod in Hordaland Overview, region



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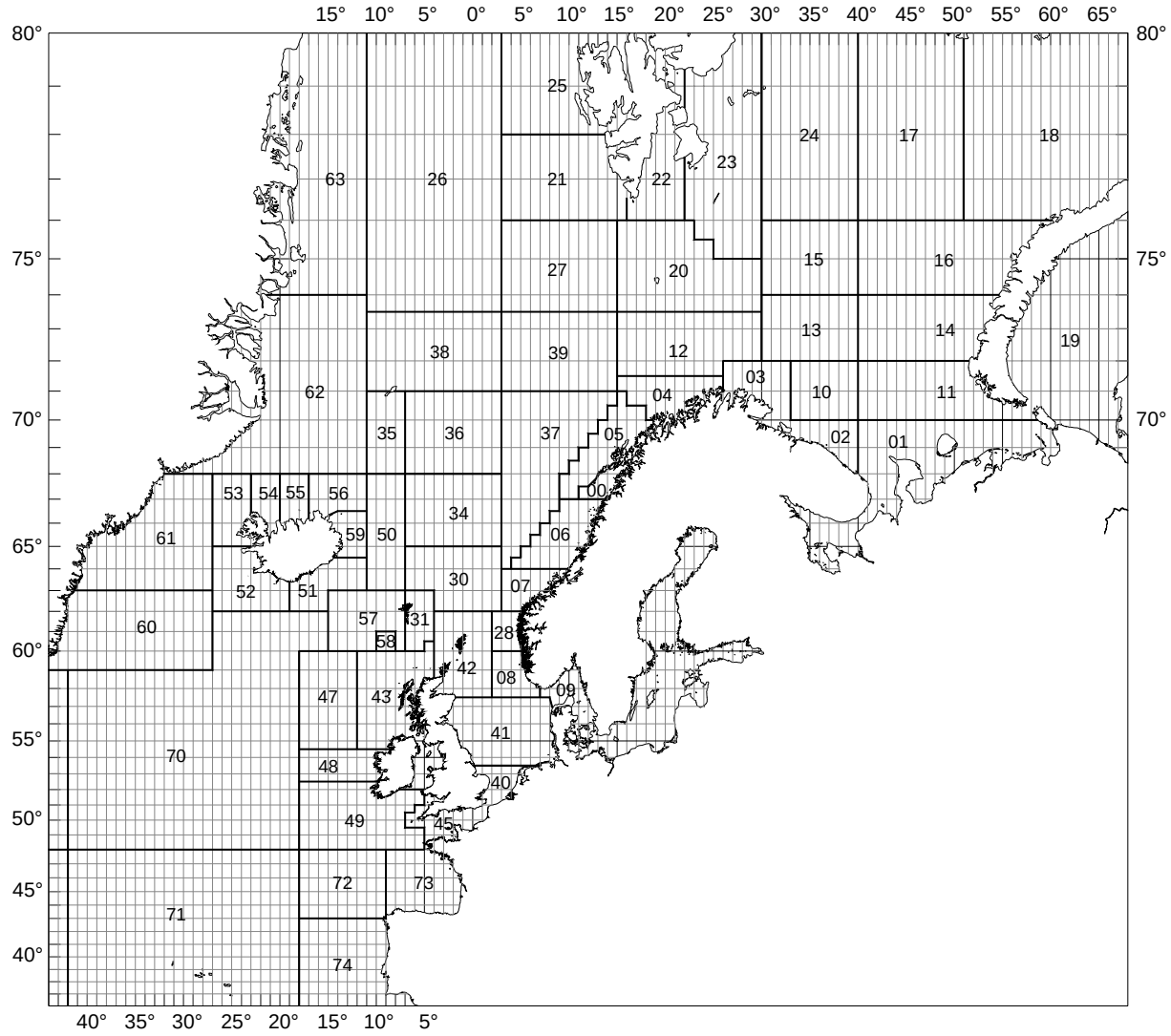
Manual for sampling of fish and crustaceans, Appendices, Maps	1.0

System 2, statistical region



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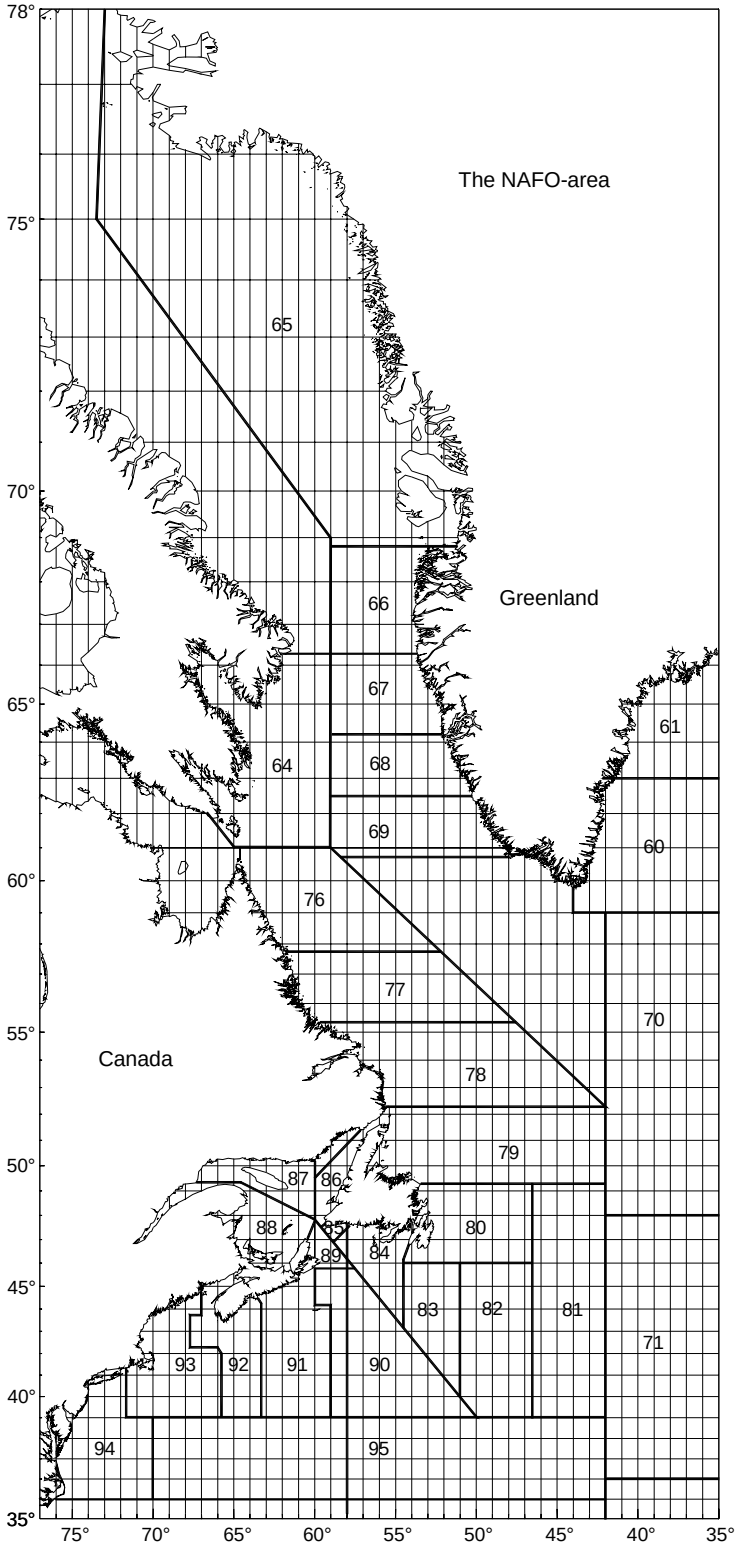

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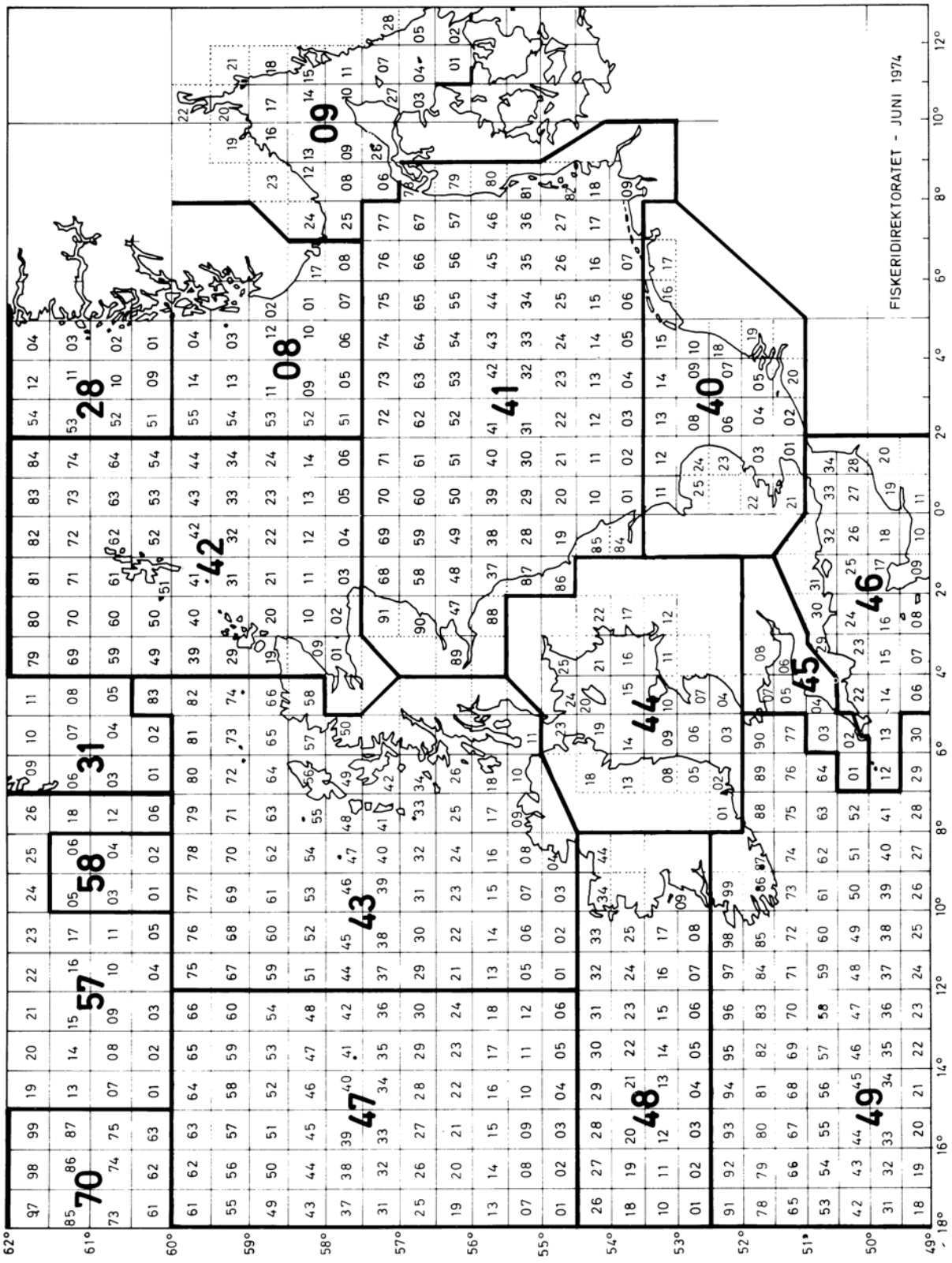

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Manual for sampling of fish and crustaceans, Appendices, Maps	1.0

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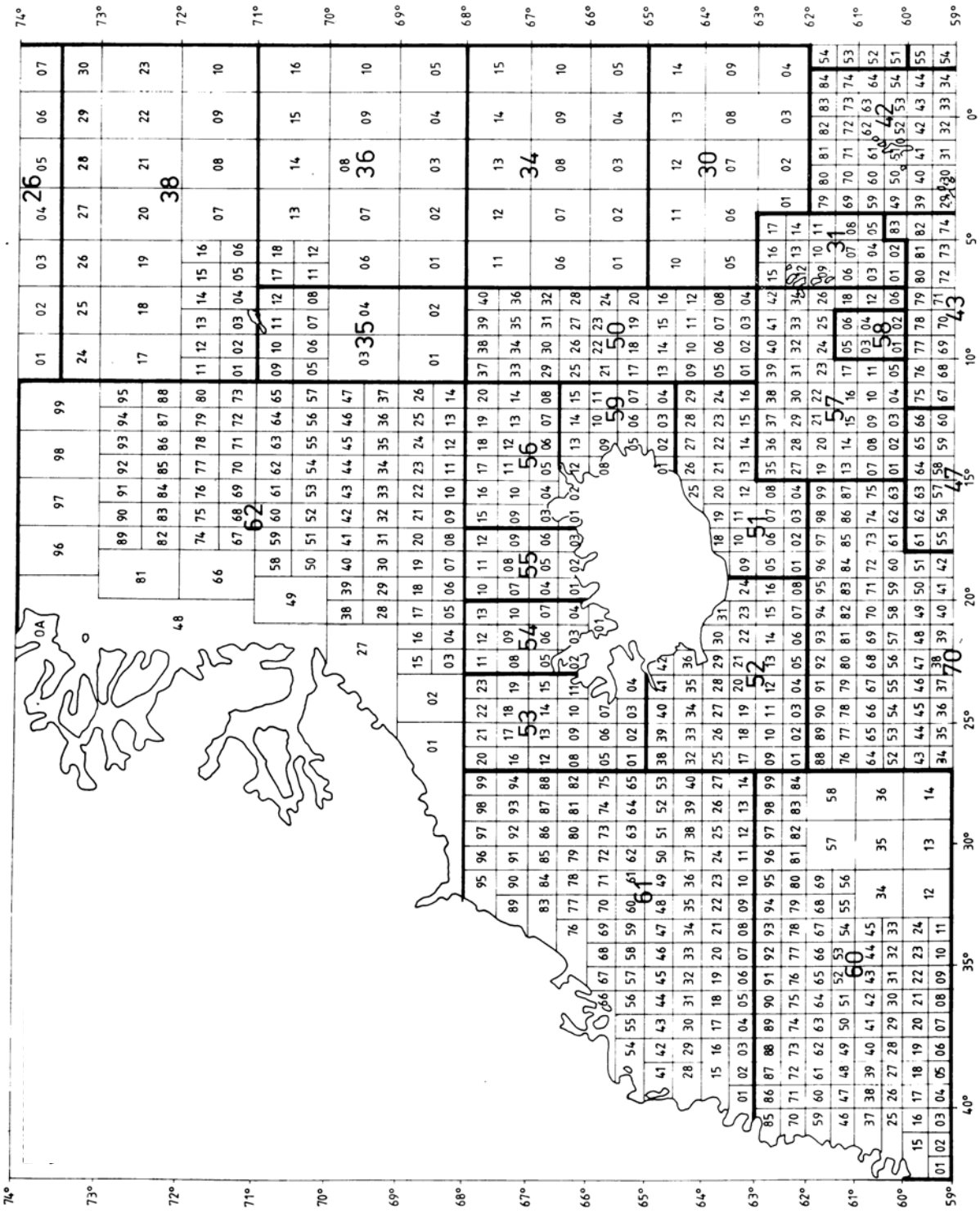

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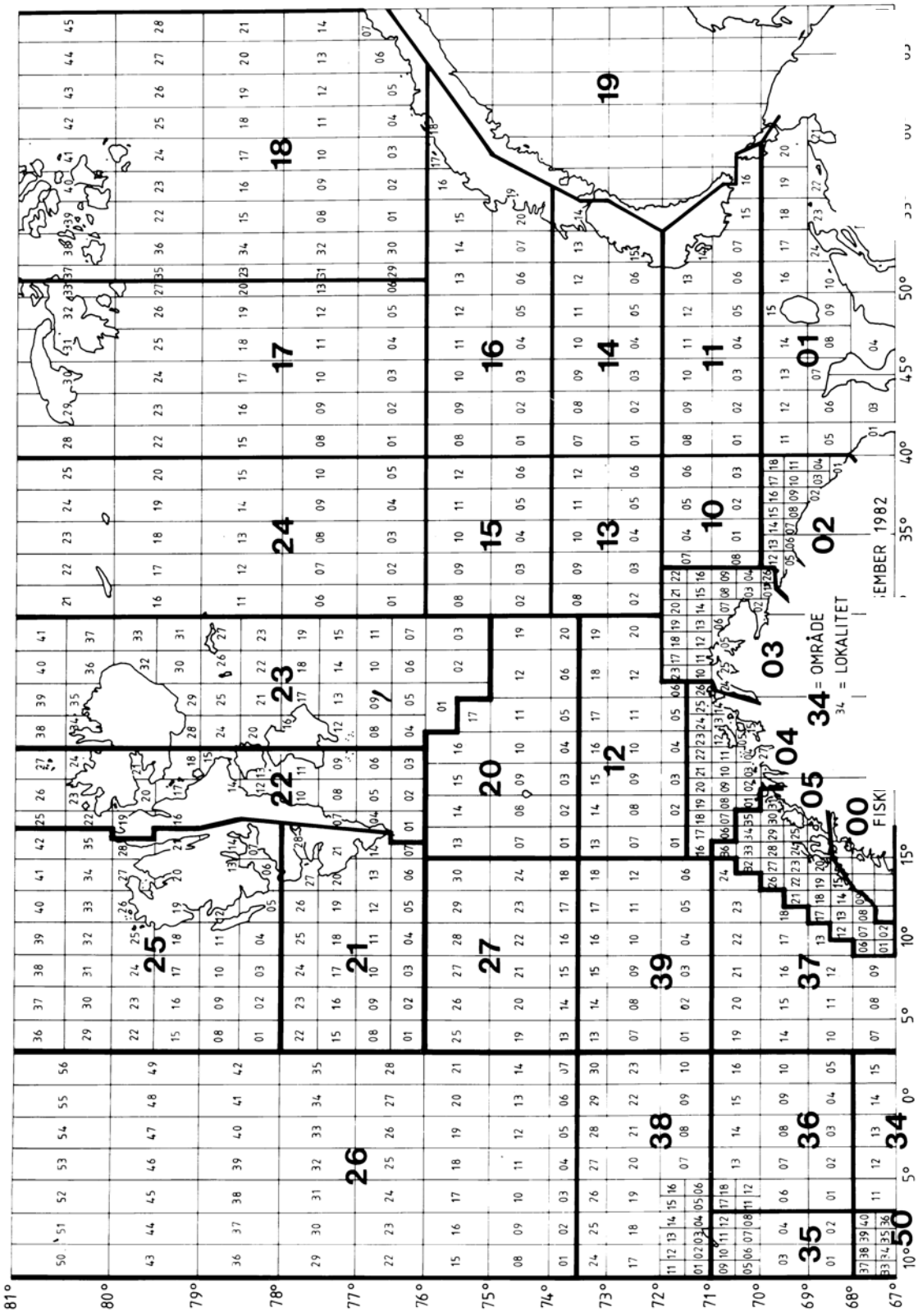

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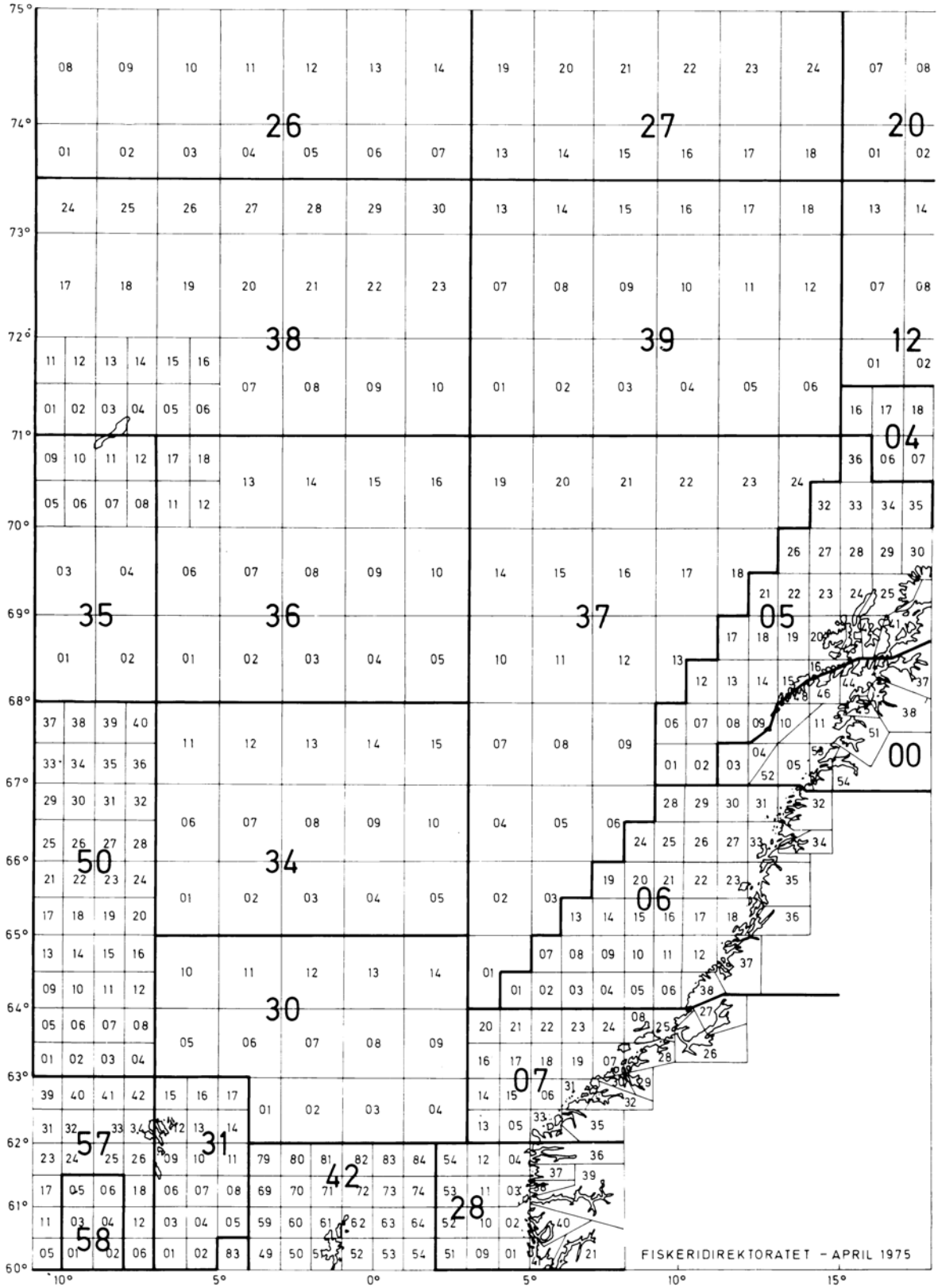
System 2, statistical region



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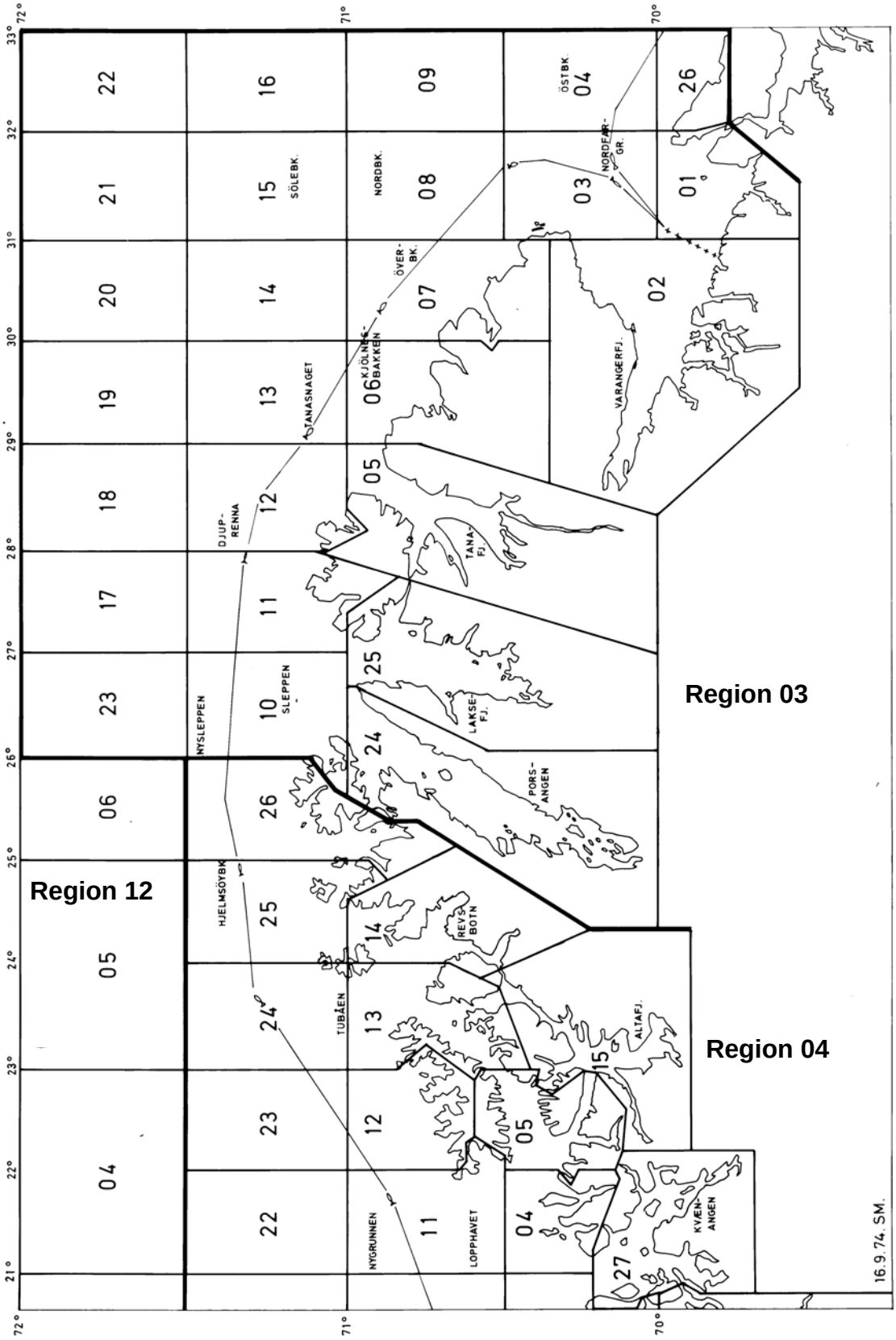

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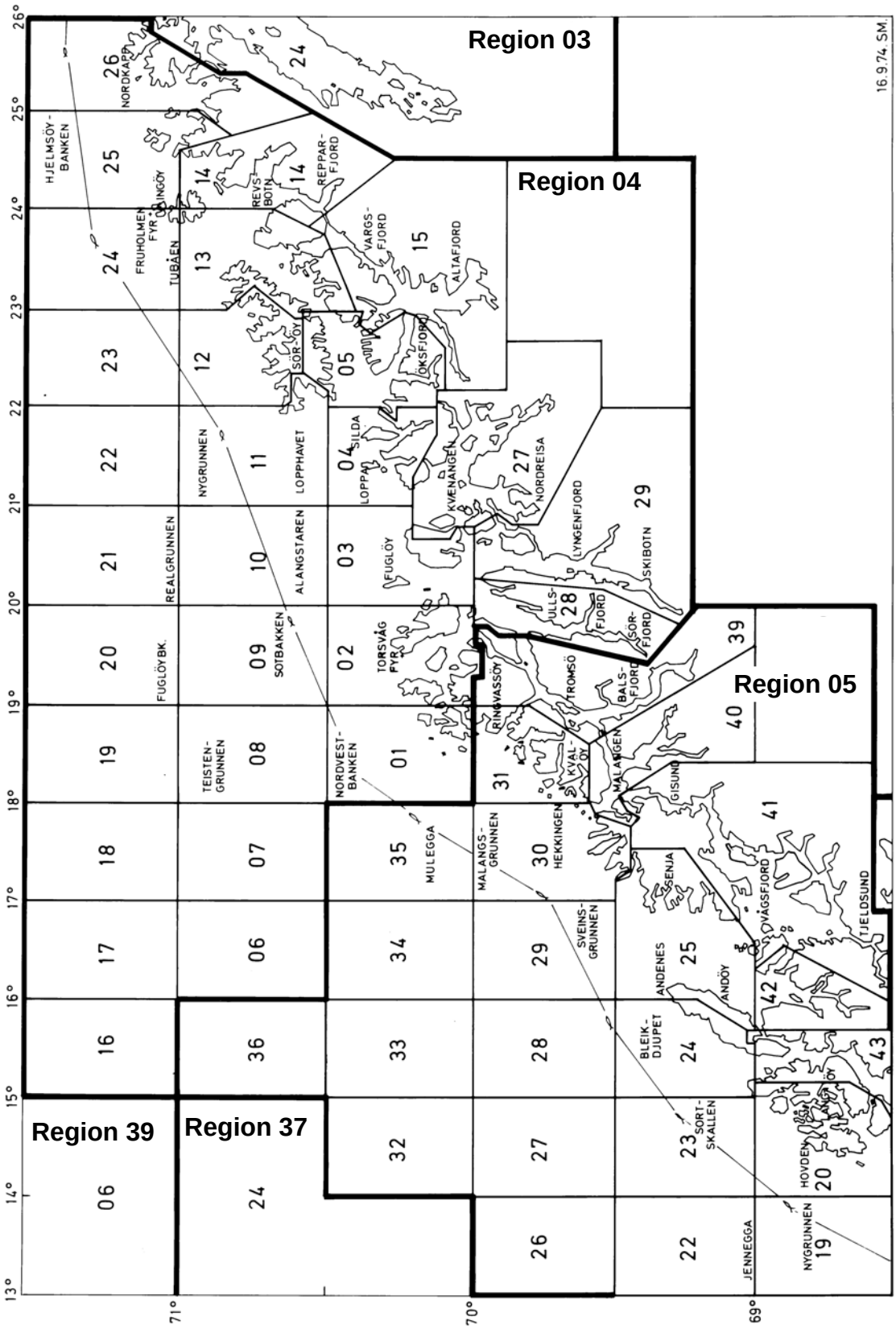

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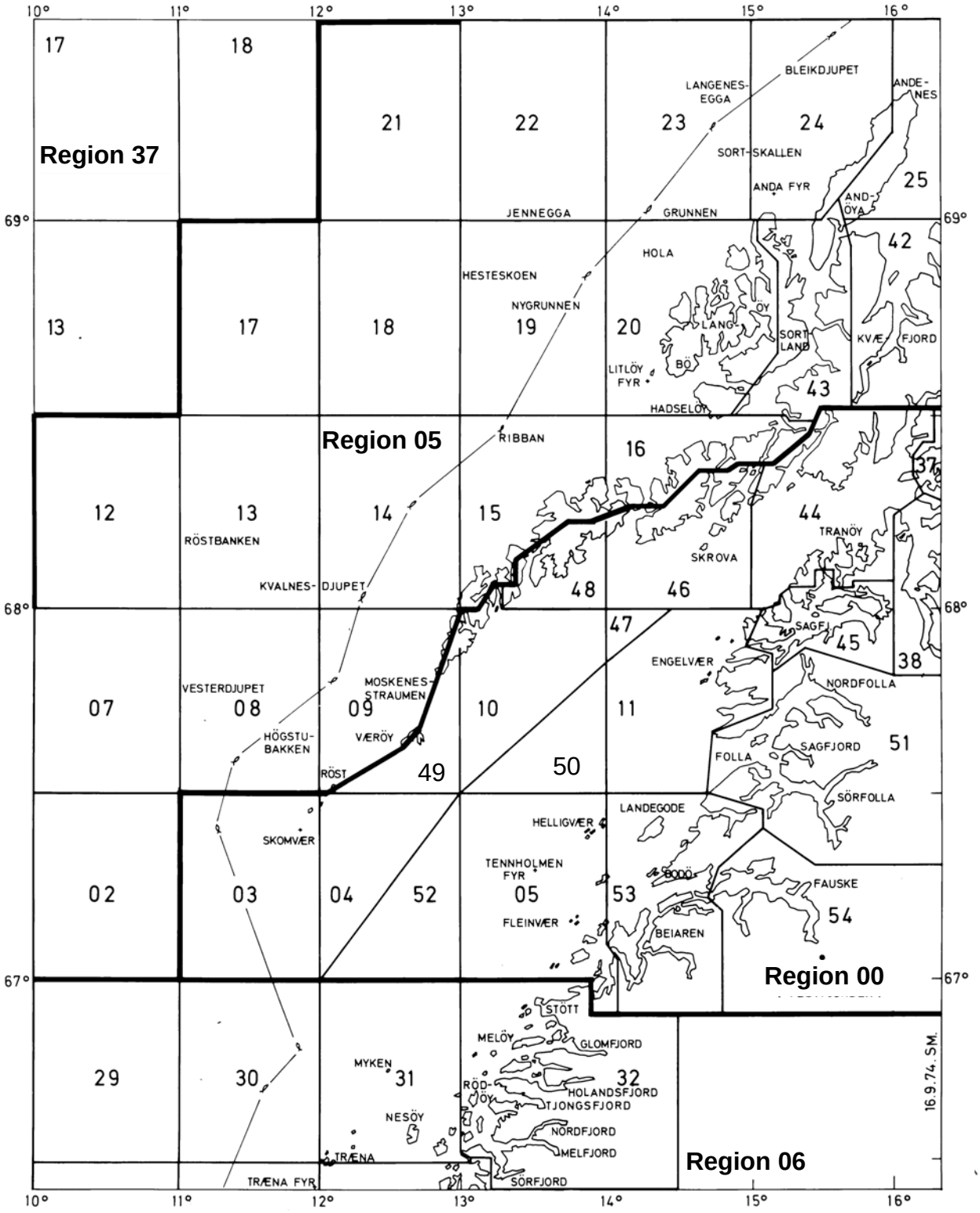

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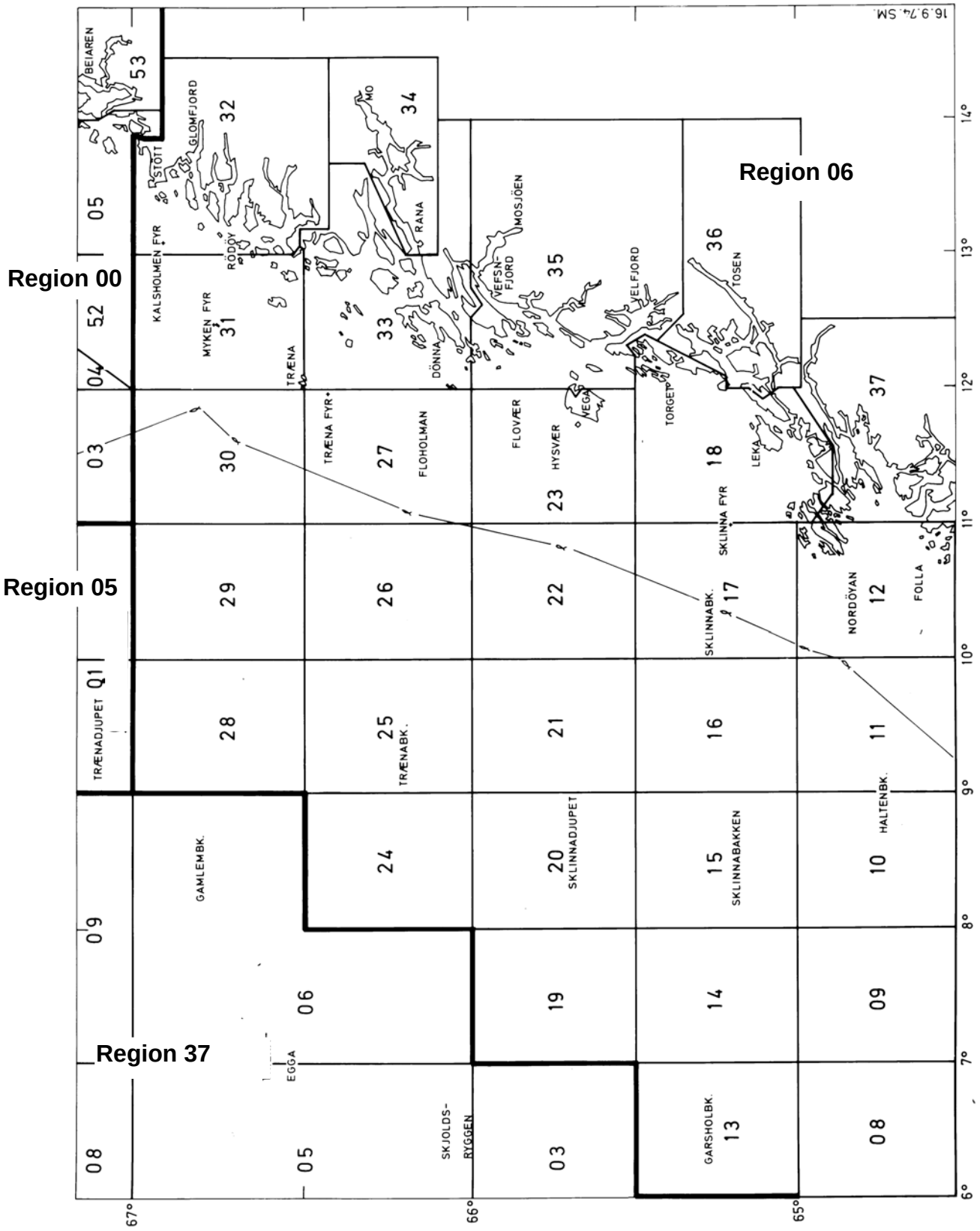

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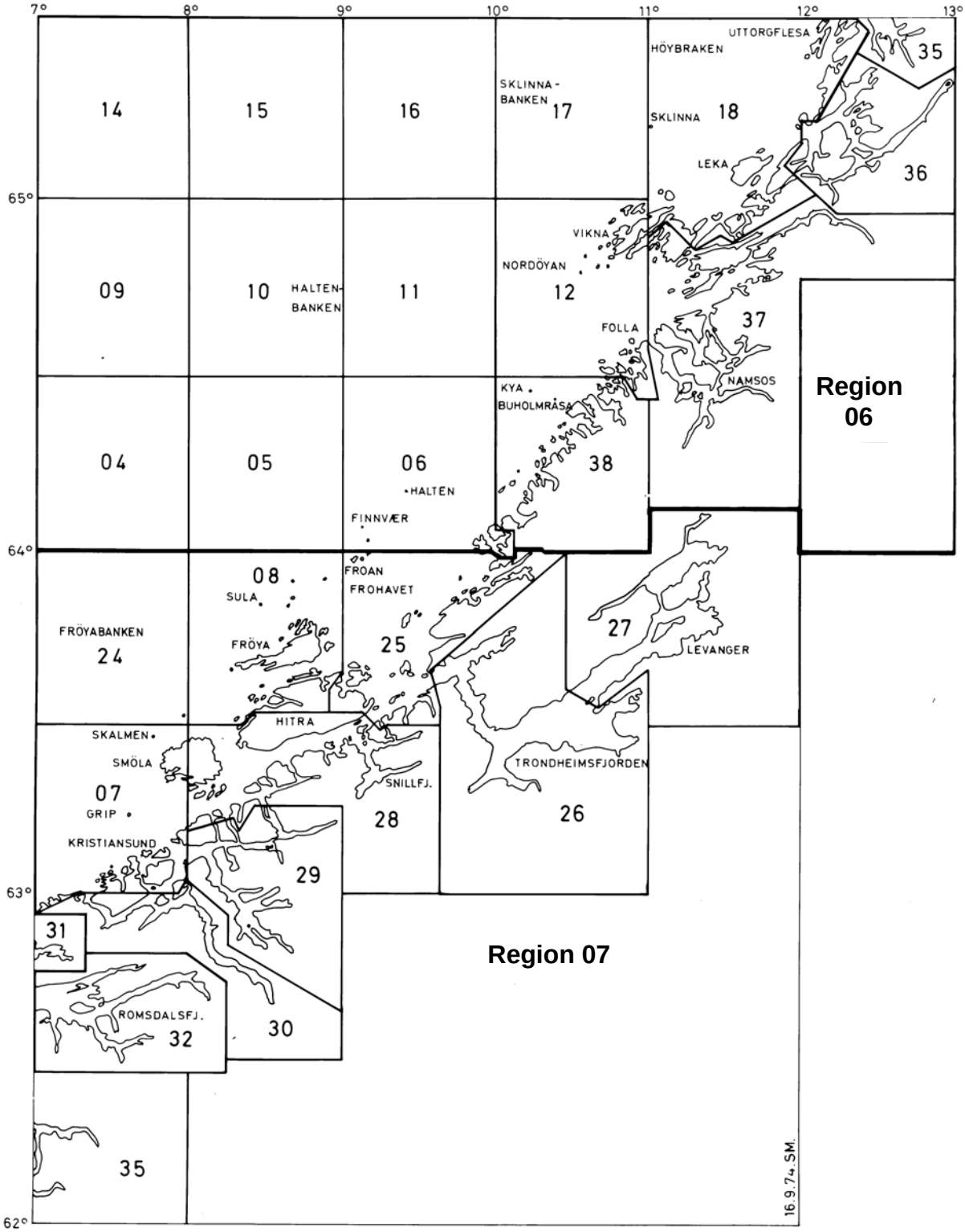

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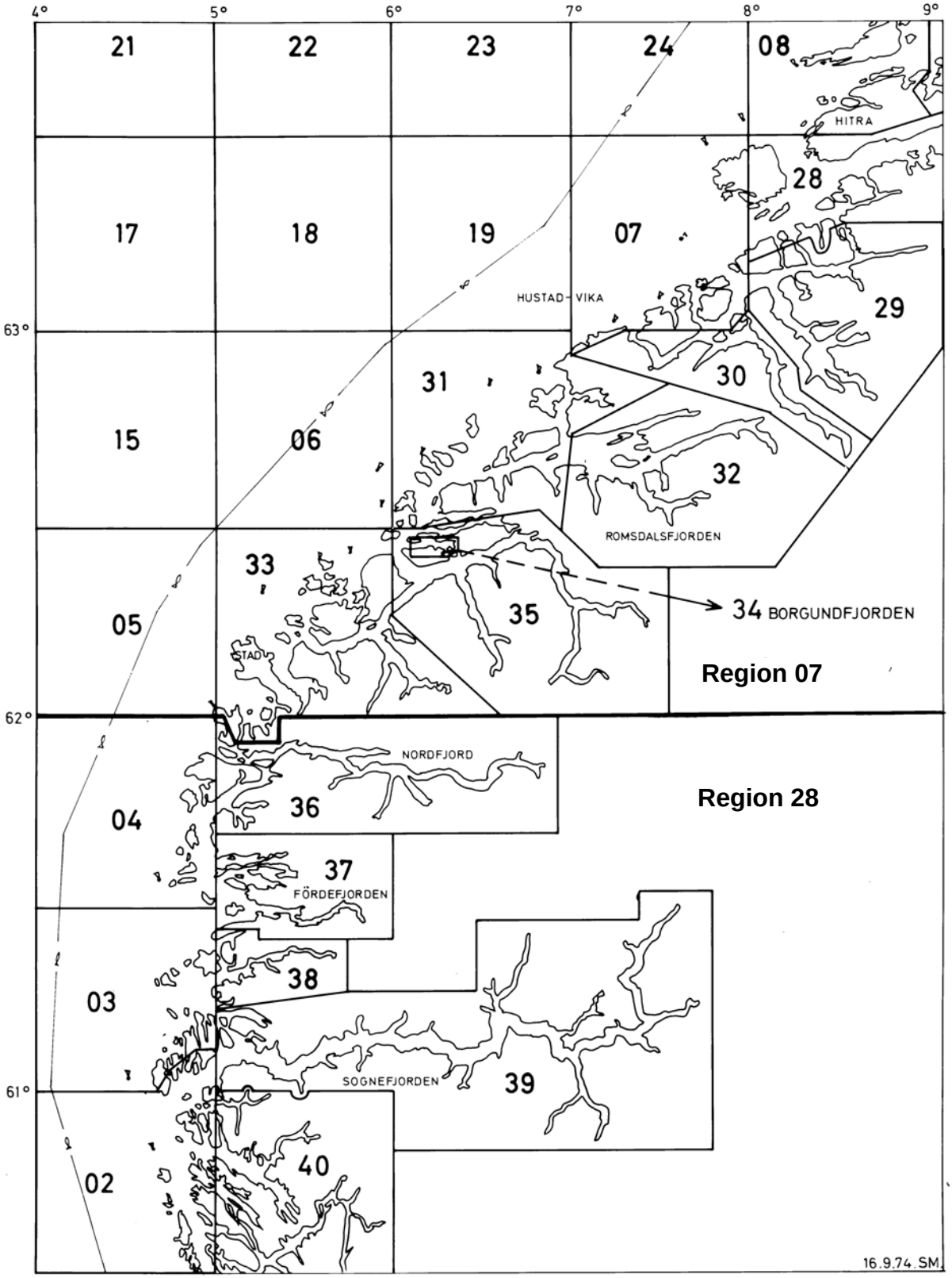

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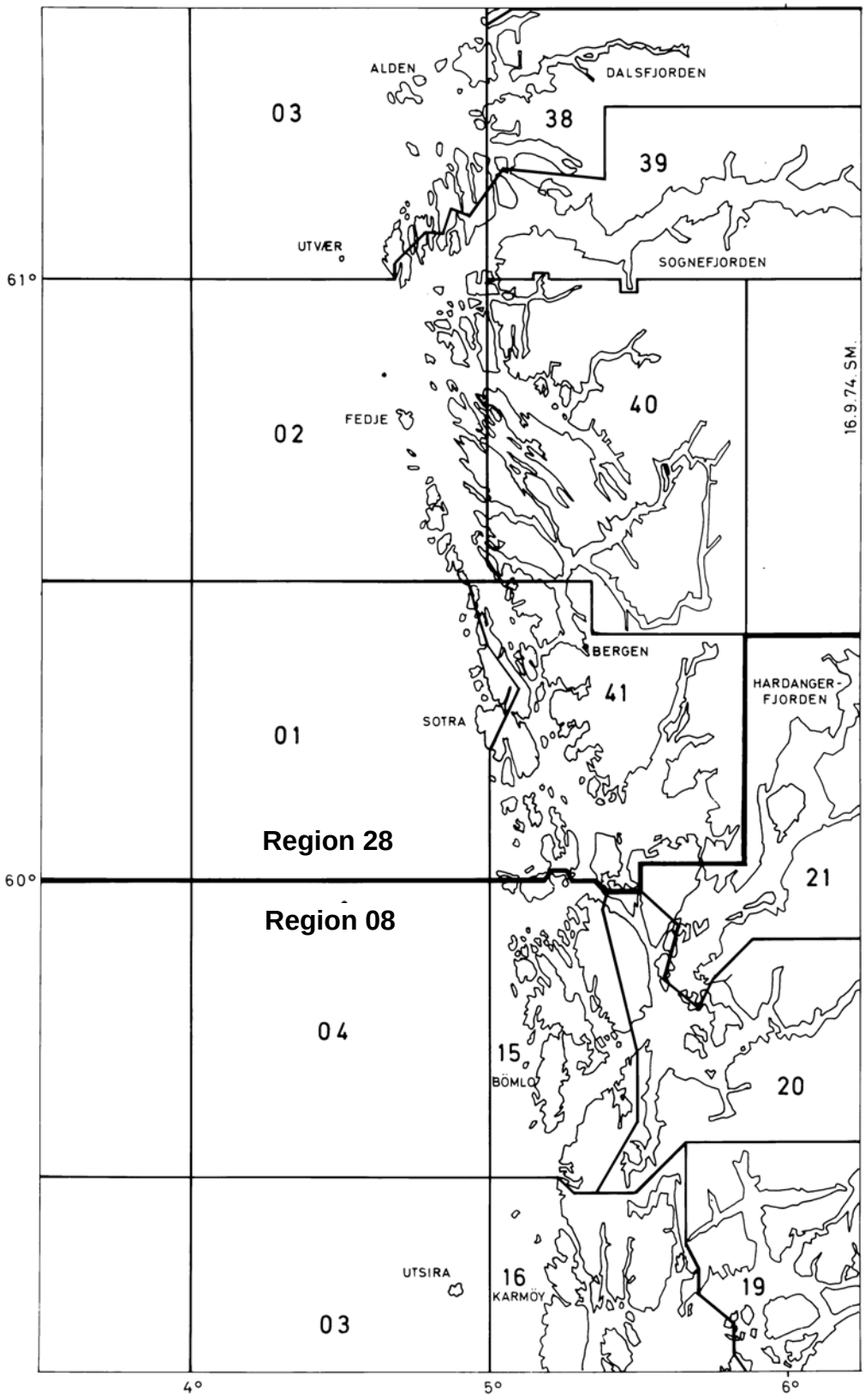

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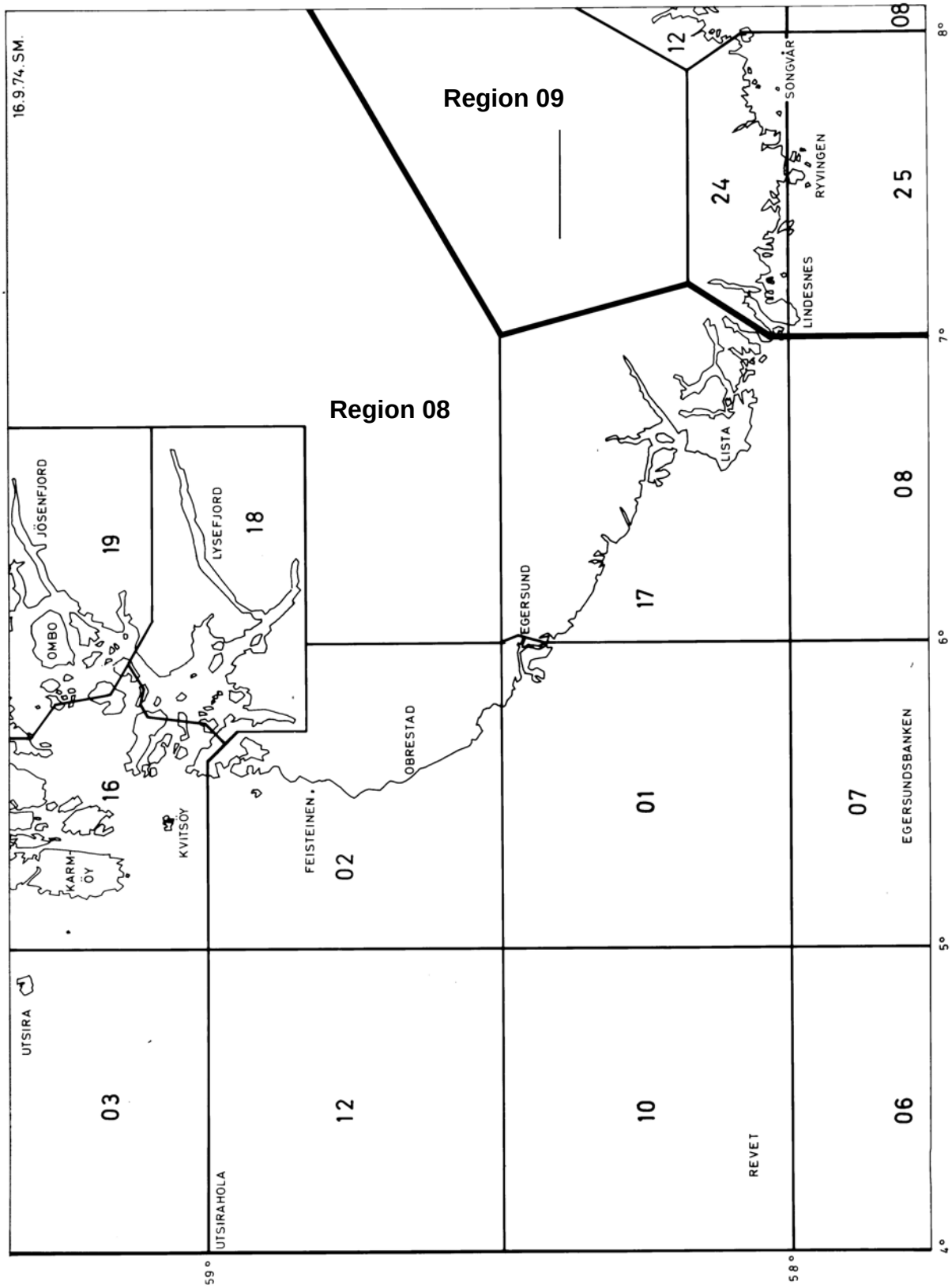

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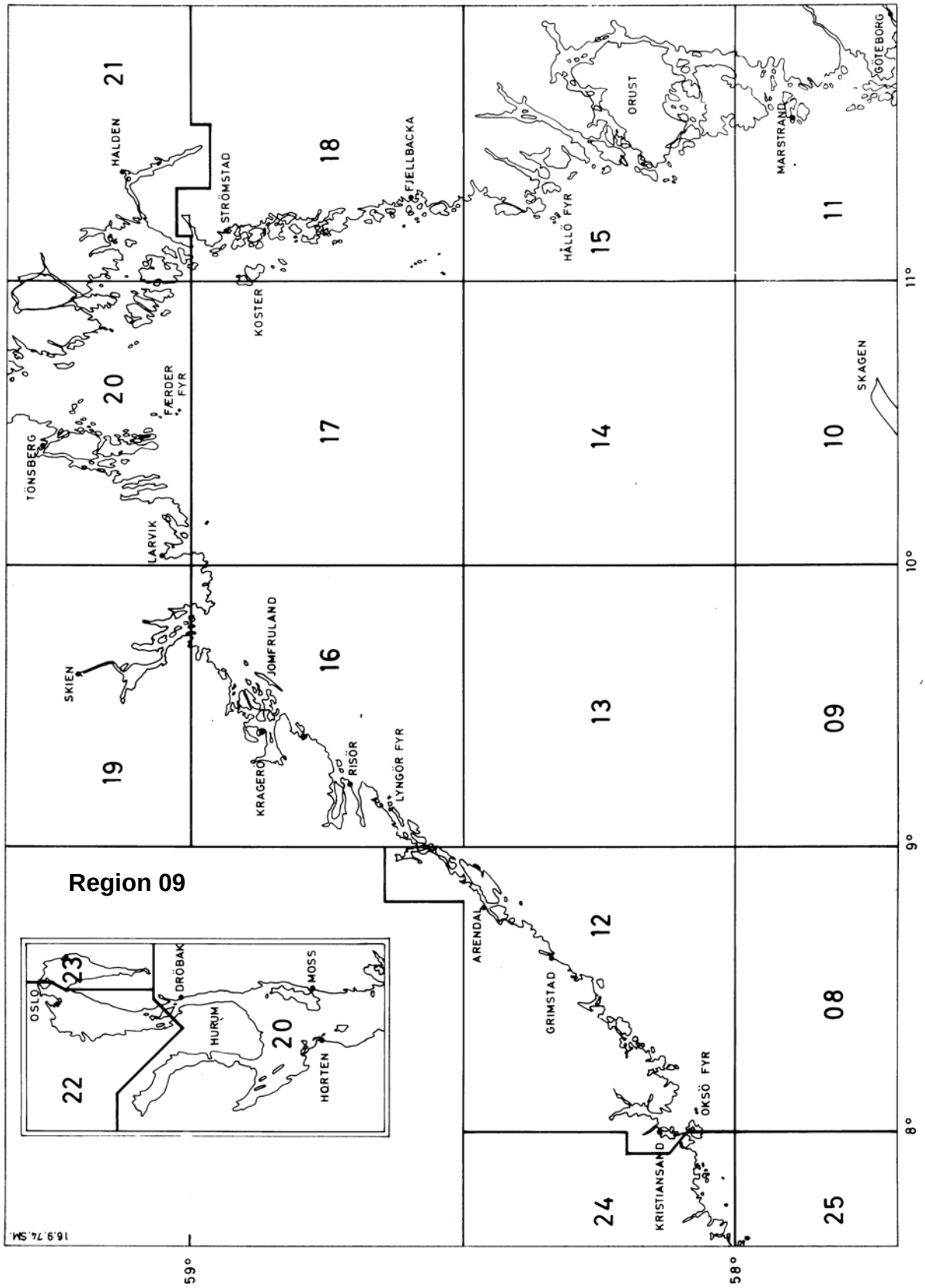

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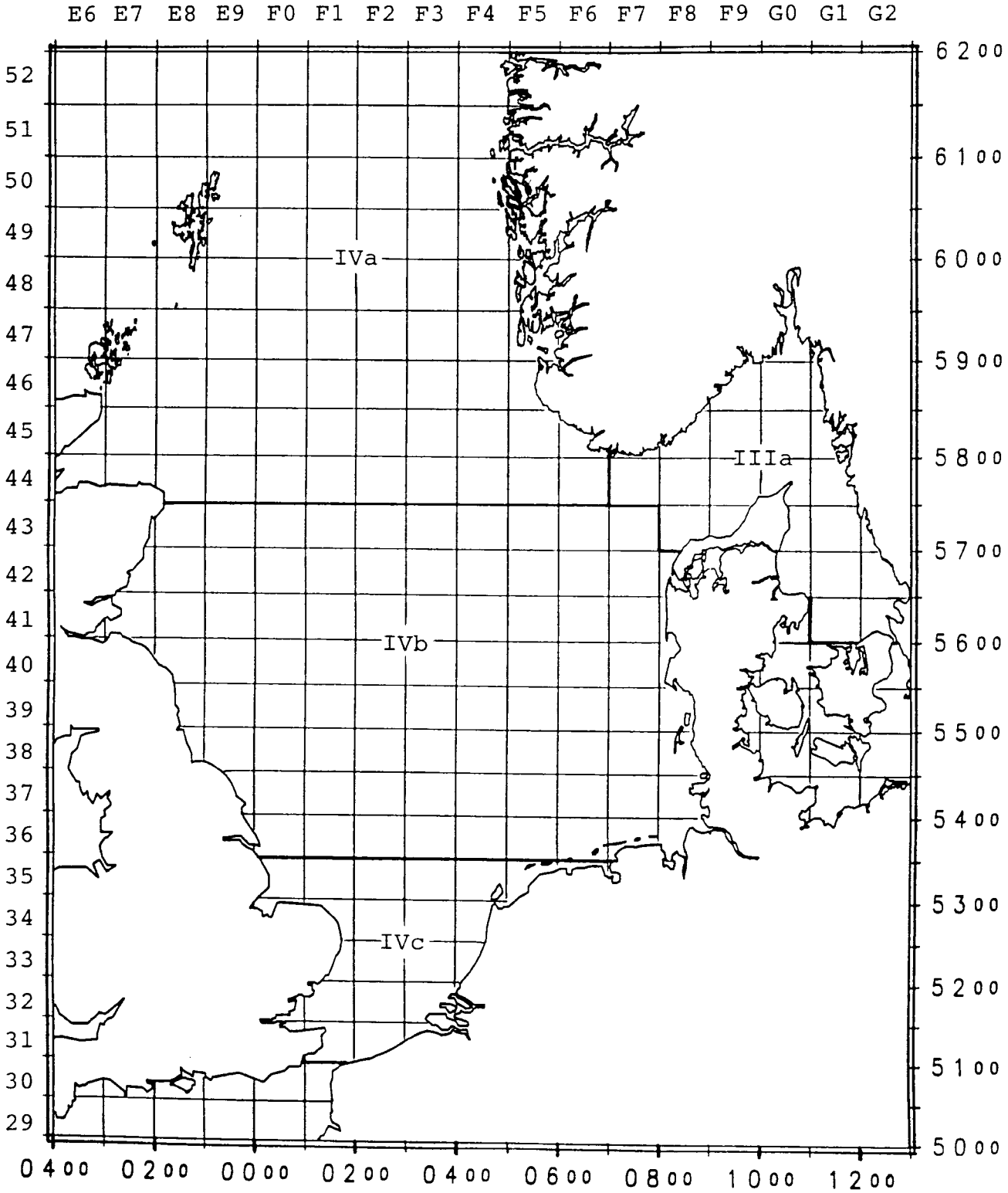
System 3, ICES regions in the North Sea



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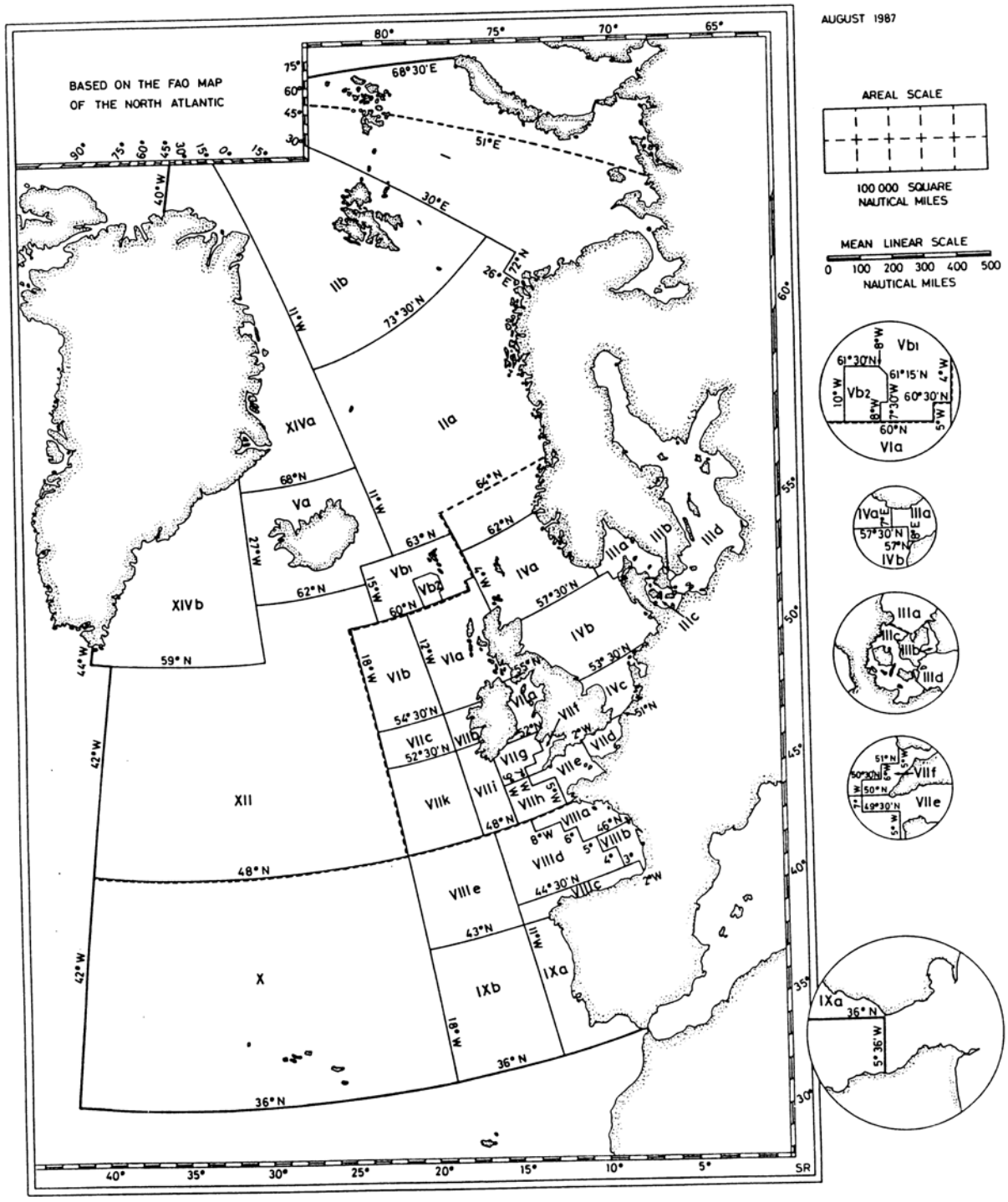
Manual for sampling of fish and crustaceans, Appendices, Maps	1.0

System 3, Overview of ICES regions



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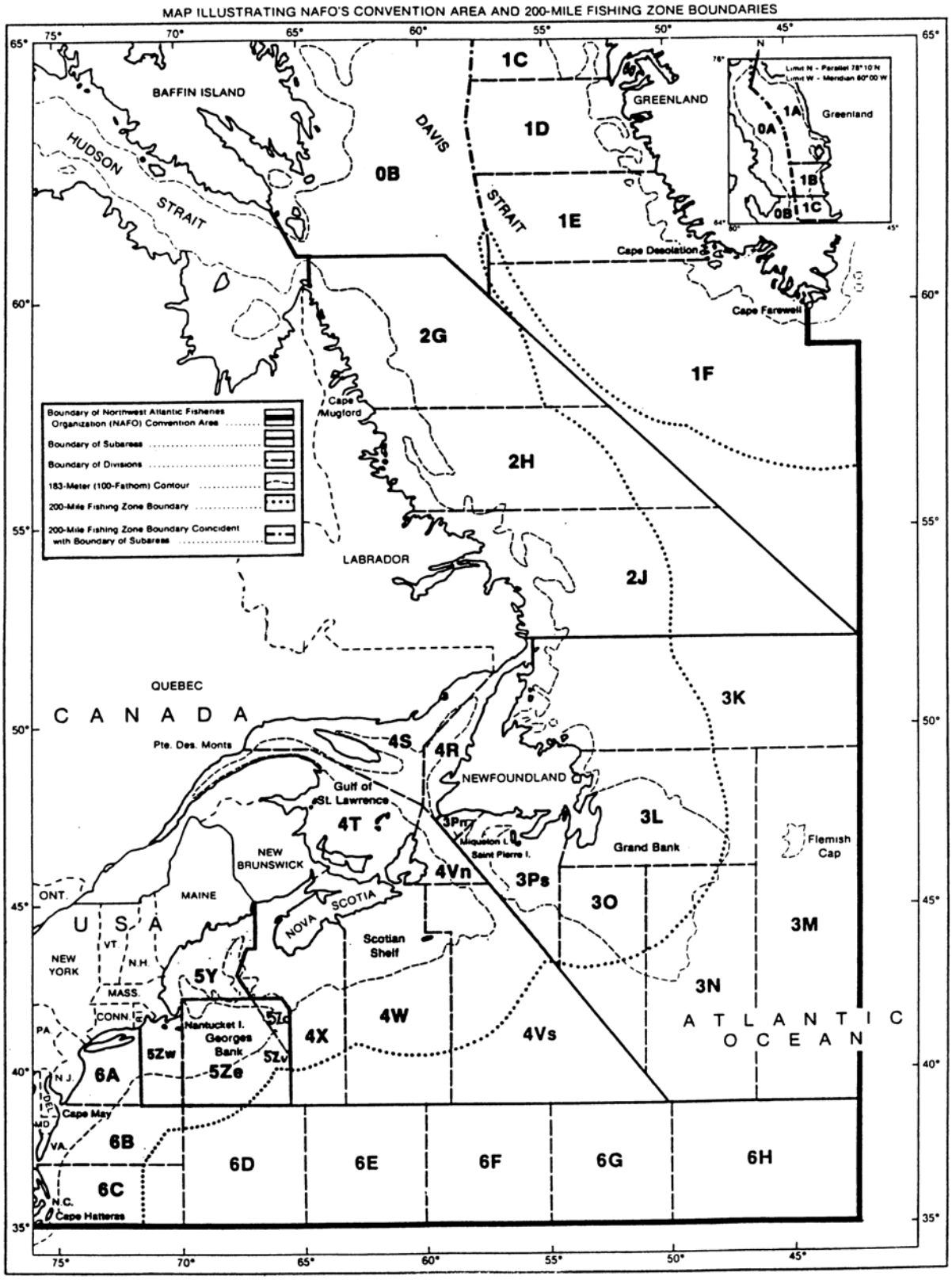
System 3, Overview of NAFO-regions



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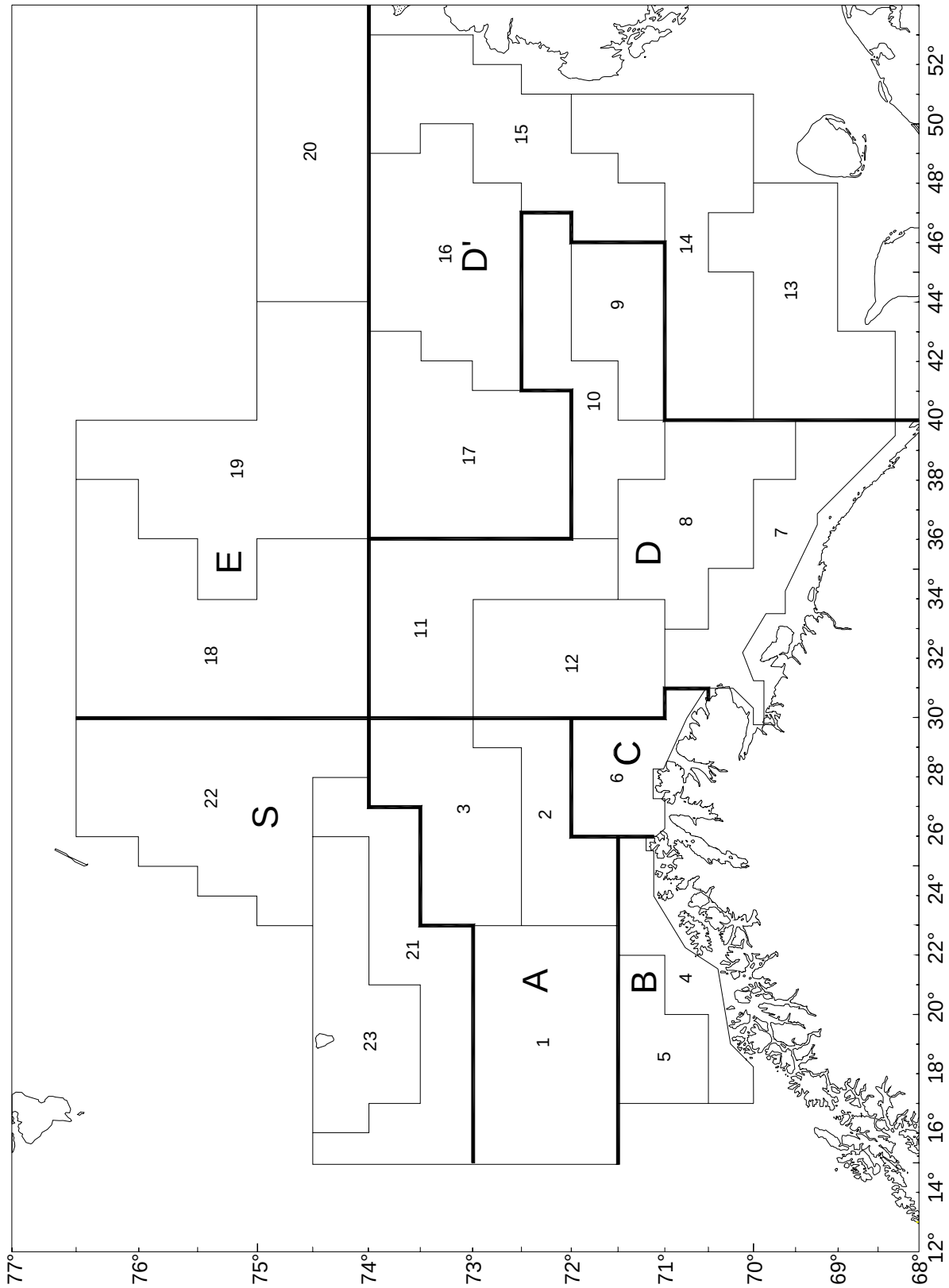
System 4, Bottom trawl survey in the Barents sea



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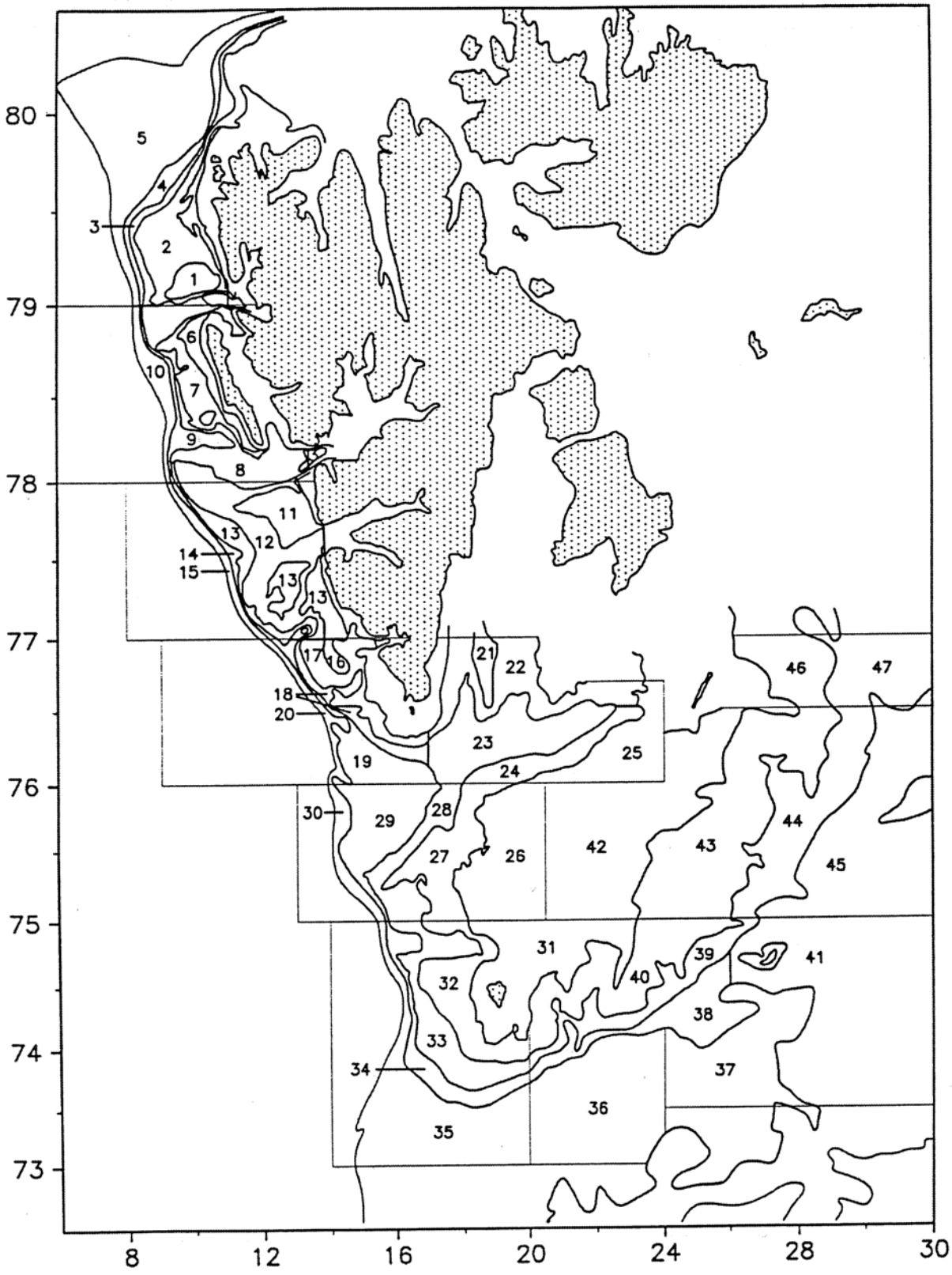
System 5, Bottom trawl survey in the Spitsbergen region



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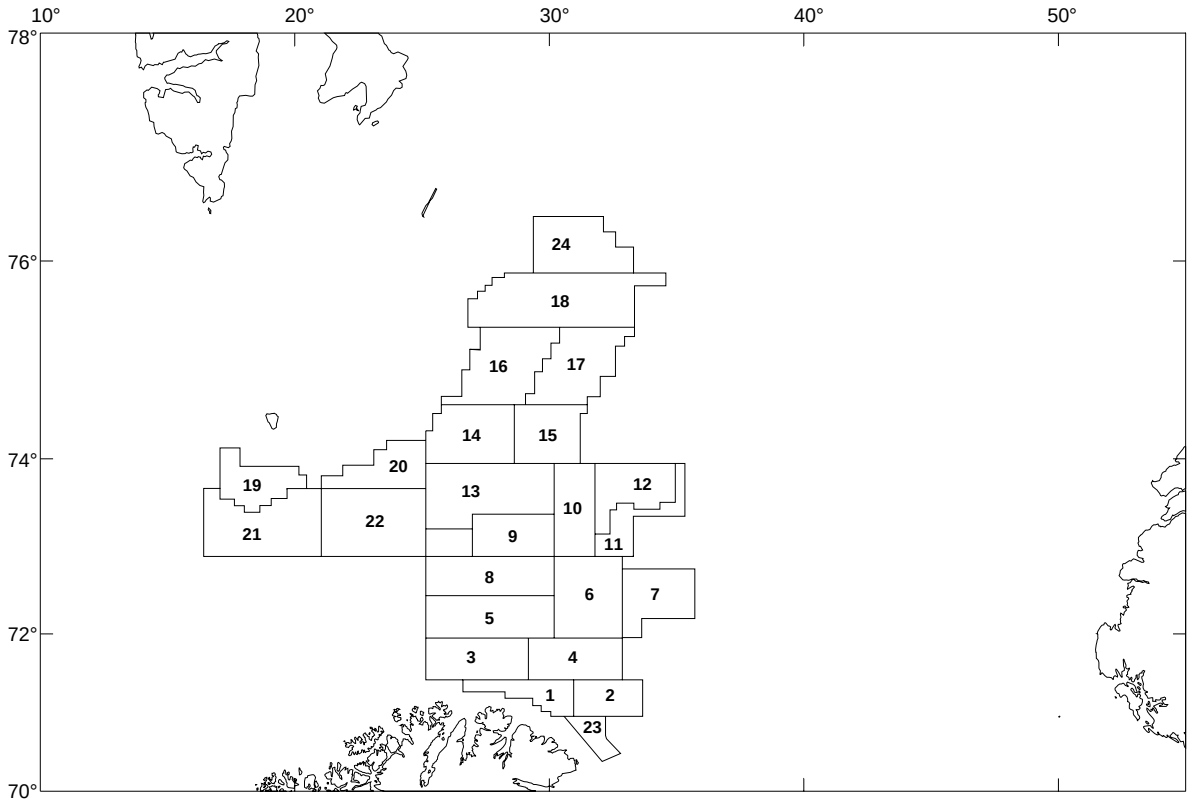
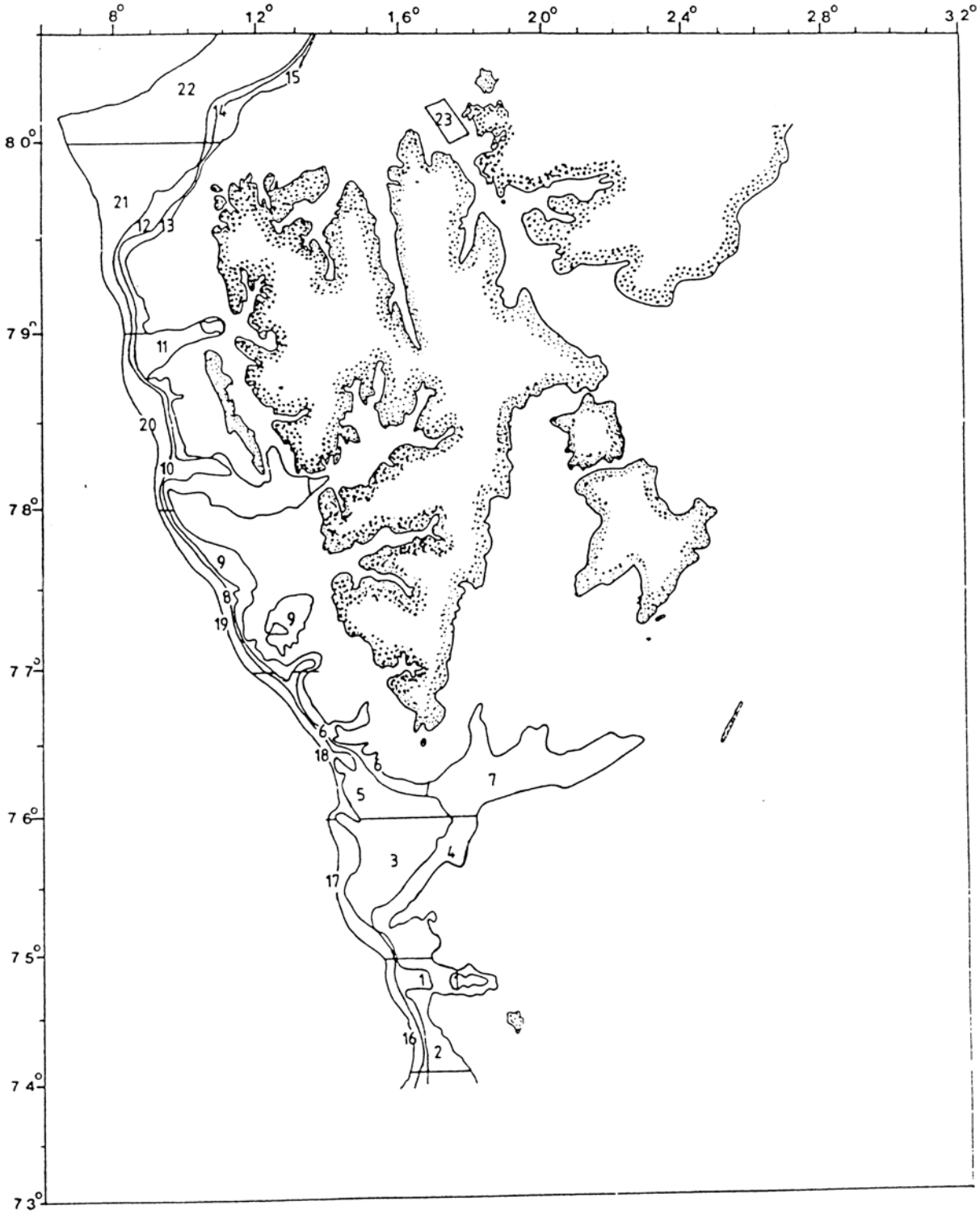
System 6, Shrimp survey in the Barents Sea



System 7, Shrimp survey in the Spitsbergen region.
*) Same strata divisions for the deep sea regions as for bottom trawl surveys in the Spitsbergen region, but with a different numerical order.



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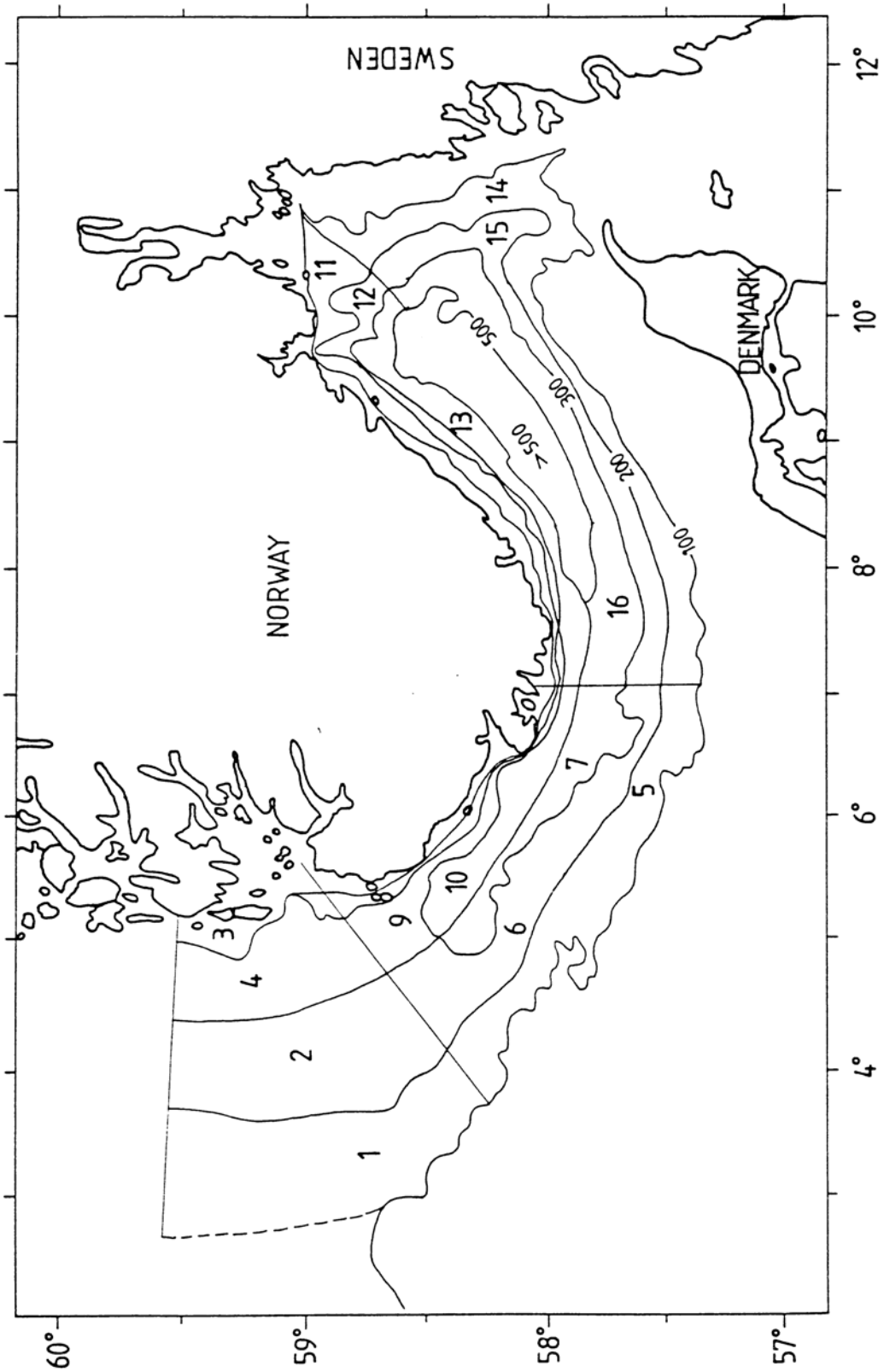
System 8, Shrimp in the Skagerrak



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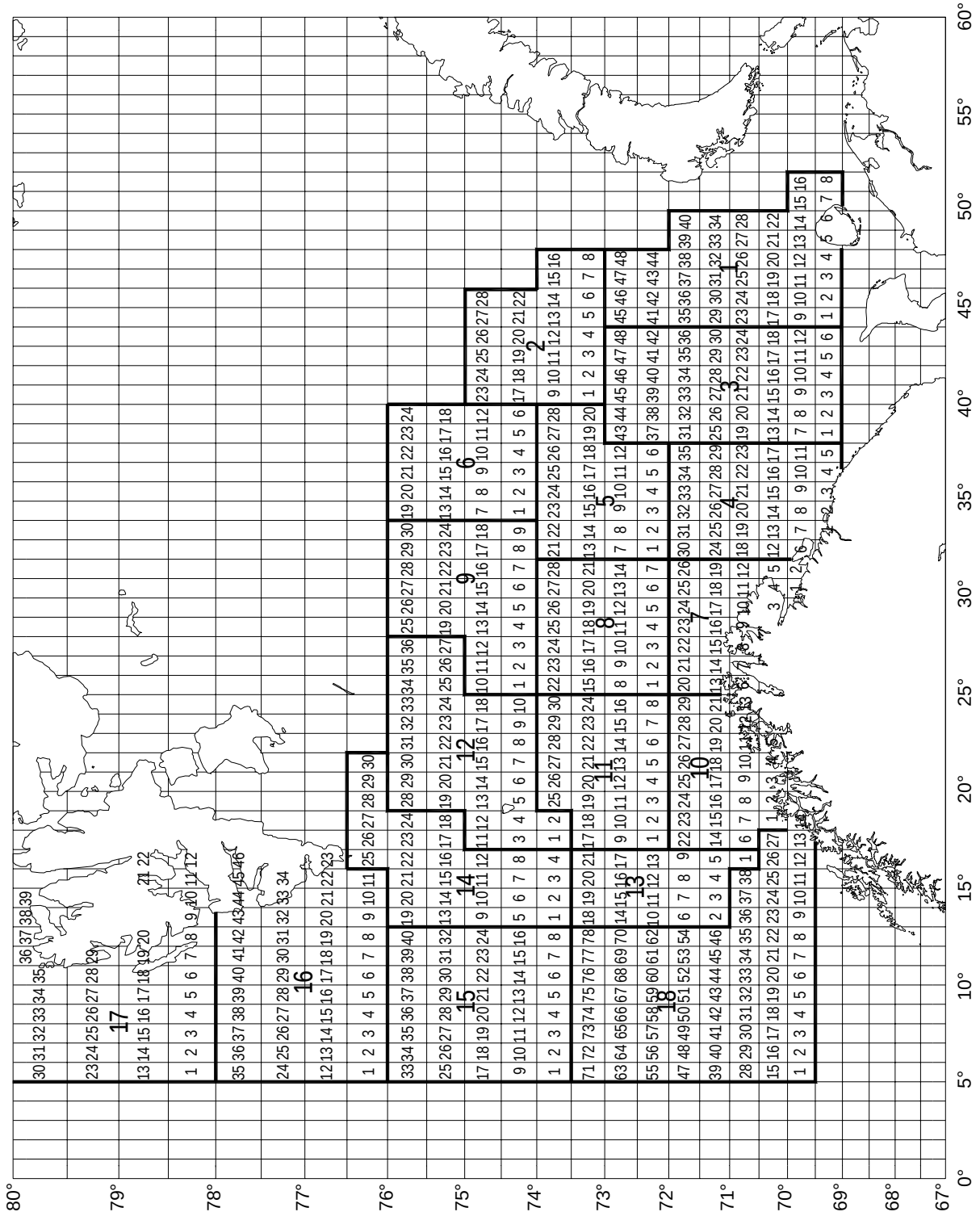
System 9, 0-group survey in the Barents Sea



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5.5 Forms

FISHING STATION FORM (S)

Samples from vessel

Name:___________________ M.M.S.I.: ________

YEAR	NATION	VESSEL CODE	VESSEL	MONTH	DAY	STN NO	SERIAL NO	STN TYPE	POSITION LATITUDE	POSITION LONGITUDE	N S EW	SYSTEM	REGION	LOCATION	BOTTOM DEPTH
2 3 4	5 6	7	8 9 10 11 12 13	14 15	16 17	18 19 20 21	22 23 24 25 26	27	28 29 30 31 32	33 34 35 36 37 38	39	40	41 42	43 44 45	46 47 48 49
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NO OF GEARS	GEAR CODE	GEAR NO	DIRECTION	SPEED	START (UTC) TIME	START (UTC) LOGG	STOP TIME	DISTANCE	CONDITION	QUALITY	FISHING DEPTH MAX	FISHING DEPTH MIN
50 51	52 53 54 55	56 57	58 59	60 61	62 63 64 65	66 67 68 69	70 71 72 73	74 75 76	77	78	79 80 81 82	83 84 85 86
				.		.		.				

OPN	ST DEV OPN	DOOR DIST	ST DEV DOOR DIST	SPESIAL CODE	WIRE LENGTH
87 88 89	90 91	92 93 94	95 96 97	98 99	00 01 02 03
.	.		.		

Sampler: _________ Forms written and
Coded: _________ tested by: ________

Catch
Sample: _________ Total: _________

SAMPLING FORM

SPECIES CODE	SPECIES	PART SAMPLE	SAMPLE TYPE	GROUP	CONSERV	CATCH MEAS	CATCH VEIGHT/VOL	CATCH NUMBER	LENGTH SAMPLE MEAS	LENGTH SAMPLE L.MEAS	LENGTH SAMPLE VEIGHT/VOL	LENGTH SAMPLE NUMBER	SPECIMEN SAMPLE NUMBER	OTOL./SCALE	PARASITE	STOMACH	GENETICS
27	28 29 30 31 32 33 34 35 36 37 38 39	40	41 42	43 44	45	46	47 48 49 50 51 52 53	54 55 56 57 58 59	60	61	62 63 64 65 66 67	68 69 70 71	72 73 74 75	76	77	78	79
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Comments:

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LENGTH FREQUENCY FORM (U)

YEAR (2 3 4)	NATION (5 6)	VESSEL CODE (7)	VESSEL (8 9 10 11 12 13)	MONTH (14 15)	DAY (16 17)	STN NO (18 19 20 21)	SERIAL NO (22 23 24 25 26)	STN TYPE (27)	SPECIES (28 29 30 31 32 33 34 35 36 37 38 39)	PART SAMPLE (40)

LENGTH FREQUENCIES IN NUMBER

INTERVAL (41)	SEX (42)	LOWER LENGHT GROUP (43 44 45)	46 47	48 49	50 51	52 53	54 55	56 57	58 59	60 61	62 63	64 65	66 67	68 69	70 71	72 73	74 75	76 77	78 79	80 81	82 83	84 85	86 87	88 89	90 91	92 93	94 95	96 97	98 99	00 01	02 03	04 05	06 07	08 09	10 11	12 13	14 15	16 17	18 19

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JANUARY 1997

SPECIMEN FORM (V)

Sheet no: ____ of total: ____
Sampler: _____
Read/measured: _____
Coded/tested by : _____

YEAR	NATION	VESSEL CODE	VESSEL	MONTH	DAY	STN NO	SERIAL NO	STN TYPE	SPECIES	PART SAMPLE
2 3 4	5 6	7	8 9 10 11 12 13	14 15	16 17	18 19 20 21	22 23 24 25 26	27	28 29 30 31 32 33 34 35 36 37 38 39	40

FISH NO	VEIGHT/ VOL	VEIGHT/ VOLUME	LENGTH UNIT	LENGTH	FAT	SEX	STAGES	SPECIAL STAGES	STOMACH CON	DIGESTIVE STA	LIVER	PARASITE	SPESIAL CODE	VERTEBRAE	AGE	SPAWNING AGE	SPAWNING ZONES	LEGIBILITY	TYPE	EDGE	CORE/NUCLEUS	CALIBRATION	GROWTH ZONES 1	2	3	4	5	6	7	8	9	TOT	TYPE OF TAG	SERIAL CODE	TAG NUMBER	VEIGHT/ VOL	GONAD QUANTITY	LIVER QUANTITY	GUTTED WEIGHT/VOL
41 42 43	44	45 46 47 48 49	50	51 52 53	54	55	56	57 58	59	60	61	62	63 64 65 66	67 68	69 70	71 72	73 74	75	76	77	78	79 80	81 82	83 84	85 86	87 88	89 90	91 92	93 94	95 96	97 98	99 00	01	02 03	04 05 06 07 08 09	10	11 12 13 14	15 16 17 18	19 20 21 22 23
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