



FISKERIVERKET

MEMORANDUM

Date  
2004-05-06

SWEDISH NATIONAL PROGRAMME FOR  
COLLECTION OF FISHERIES DATA 2005

**in accordance with**

**Council Regulation (EC) No 1543/2000**

**Council Decision 2000/439/EC**

**Commission Regulation (EC) No 1639/2001**

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## 1. Introduction

This document describes the Swedish Programme for 2005 for the collection of data in the fisheries sector.

Through its accession to the European Union in 1995, Sweden adopted the EU's Common Fisheries Policy (CFP). All Member States are covered by its provisions and are nationally responsible for its implementation. In Sweden, the National Board of Fisheries is the administrative authority responsible for fisheries and fisheries issues.

The underlying Regulation<sup>1</sup> for the CFP states briefly that its aims shall be to protect and preserve aquatic resources through socially and economically responsible exploitation based on ecological considerations.

The Council has, in accordance with the CFP, decided to set up a community framework for the collection and management of data required for the evaluation of fishery resources and the fisheries sector, which is regulated in Council Regulation (EC) No. 1543/2000. According to the Regulation, national authorities are required to establish programmes to collect relevant data of a biological and economic nature, to describe the procedures involved and to make the aggregated data accessible for scientific analysis. These national programmes must, in accordance with the Regulation, run for six-year periods and achieve a minimum standard. This standard, referred to as the minimum programme, is specified in Commission Regulation (EC) No. 1639/2001. Member States that comply with the minimum programme are entitled to receive financial assistance. Advance application must be made for such assistance.

The programme will be implemented through close co-operation between different departments within Fiskeriverket (National Board of Fisheries, NBF), which has its head office in Göteborg:

- Department of Fisheries Control (K-dep)
- Department of Resource Management (RF-dep)
- Department of Research and Development (FoU-dep) with the Institute of Marine Research (IMR) in Lysekil and Karlskrona, the Institute of Freshwater Research in Örebro and the Institute of Coastal Research (ICR) in Öregrund and Simpevarp

The Institute of Marine Research in Lysekil co-ordinates the Swedish programme.

Primary data collected within the Swedish programme will be stored in the following computerised databases:

- Loggbas. Integrated database containing:
  - Vessel-register. Data on fishing capacity (RF-dep)
  - Catch and landing figures from logbook coastal journal, landing declaration and sampling (species composition) . Data on origin of catches, landings and effort (K-dep)
  - Sales notes figures. Data on quantities sold, prices, and size of fish. (K-dep)

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<sup>1</sup> Council Regulation (EC) No. 3760/1992

- Fish sample database. Data on individual fish from market, discards and survey sampling (IMR, ICR)
- Economic data (RF-dep)

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Every data-collecting unit is responsible for its own database and delivery to the respective international organisation and for updating the aggregated information in the central data store. The formats of aggregated data make it possible for the Commission to have access to the data.

The primary data collected in accordance with this Regulation are treated confidentially and are not made available to anyone outside the National Board of Fisheries without special authorisation.

### **1.1 Co-operation between Sweden and other member states and reporting to the Commission**

The collection of information on fishing capacity, fishing effort, economics and landing statistics is conducted at a national level. Biological information about catches, information gathered by research vessels and information about discards are co-ordinated internationally in most cases and carried out in close co-operation with research institutes in Member States as well as third countries.

In the economic field, the RF-dep. constitutes the Swedish representative in the project Economic Assessment of European Fisheries organised under the Concerted Actions and Thematic Networks which is committed to developing a common method or standard for the evaluation of the economic situation in Community fisheries.

Each Member State shall submit its national programme to the Commission by electronic means, no later than 31 May every year, as stipulated in Article 6 of Council Regulation (EC) No. 1543/2000.

### **1.2 National correspondent**

In Sweden, the National Board of Fisheries is the authority responsible for the national programme.

National Board of Fisheries, Institute of Marine Research  
P O Box 4  
SE-453 21 Lysekil  
Sweden  
Tel: +46 523 187 00  
Fax: +46 523 139 77

Contact person: Fredrik Arrhenius. E-mail: [fredrik.arrhenius@fiskeriverket.se](mailto:fredrik.arrhenius@fiskeriverket.se)

### 1.3 Levels of precision

The ICES Workshop on Sampling and Calculation Methodology for Fisheries Data [WKSCMFD] is the latest meeting considering this issue and it was held in January 2004. This workshop was the first one dealing with the problem of precision related to the numerous biological parameters collected within the regulation (EC) No 1639/2001.

The required level of precision for parameters in module H is not defined in the regulation. However, recommendations on how to calculate precision for numbers at age and weight at age in national landings have been discussed for example in WKSCMFD. This work is planned to continue on an international level.

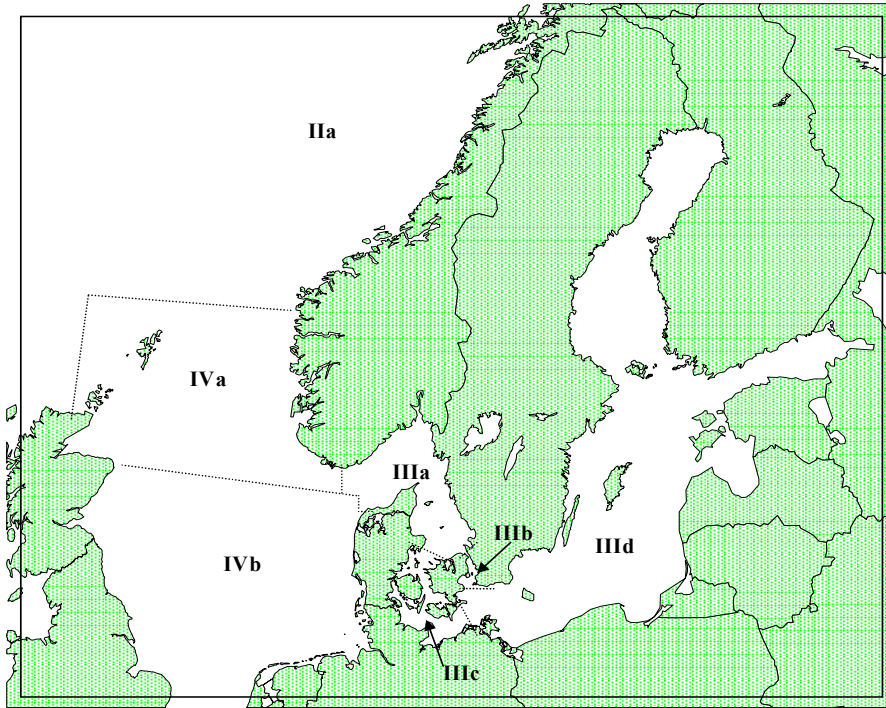
Required levels of precision for parameters in module I, are set to three different levels depending on the specific parameter. Also, the biological parameters shall be updated every three or six year for the different stocks according to the regulation. At this stage, no general recommendation exists on what method to be used to calculate precision on these parameters. The obligation to collect biological data provides an excellent opportunity for a much more standardised and co-ordinated approach, in terms of both timing and methods used. To increase the quality of stock assessment this update should be done on a stock level basis and not only on national data for a stock. This task is therefore planned to be taken care of in Regional Planning Groups (RPG), starting in 2004 for the Baltic area, and for *Nephrops*.

In Sweden all commercial landings are recorded and specified into time periods, regions and gear categories. It makes no sense calculating the margin of error as the selection of vessels is not done by random sampling.

For the collection of economic data on the fishing fleet the objective is to reach a precision level  $\pm 25\%$  for a 95 % confidence interval using a stratified simple random sampling method. For small segments or if the falling off is high, other selection methods will be used. Where appropriate, the final level of precision will be calculated on the basis of the data provided by the sampled companies according to standard statistical methods. The calculations will consequently depend on sampling method.

Concerning the processing industry, precision levels are generally high as the data collection covers the whole industry. It makes no sense calculating the margin of error as the selection of companies is not done by random sampling. The information is collected in the form of direct inquires which are scrutinised in a special software programme for consistency as concerns additions, probability and connections between the parameters. Also the administrative information is scrutinised. After this procedure the information is revised to compensate for the falling off. In the last step a final macro examination is conducted.

# ICES FISHING AREAS



## 2. Module of evaluation of inputs: Fishing capacity and fishing effort

### 2.1.C. Collection of data concerning fishing capacity

#### Minimum programme

Member States are required to collect data to permit segmentation of the fishing fleets in accordance with Commission Regulation (EC) No. 1639/2001, Appendix III and IV. This segmentation is used as the basis for determining how capacity, fishing effort and economic data for the fishing fleet will be reported. Sweden will adhere to the minimum programme as defined in Appendix II.

The intention is to collect data on the number of vessels in defined segments and vessel length categories as well as on the average gross tonnage (GT), engine power (kW) and age of the vessels' hull.

The aggregated data meet the requirements in respect of accuracy stipulated in chapter 2. C.1.c. of the implementation regulations.

Vessels are segmented on the basis of the time for which a particular gear is used. The expression "time" is used to denote fishing days. If a vessel uses a type of gear for more than 50 % of the time, the vessel should be included in the segment that covers that type of gear. If no gear is used for more than 50 % of the reported fishing time, the vessel is allocated to a segment for multi-species gear use.

All vessels which are covered by the fourth multi-annual development programme for the fishing fleet (FUPIV) will be included in the collected data. This will include all vessels of five metres or more.

The following data is collected for every vessel covered by FUPIV:

<b>DATA</b>	<b>SOURCE (log base)</b>
Number of fishing days with a particular type of gear	Log base (log books and coastal fisheries journals)
Vessel length (Length Over All)	Log base (vessel register)
Gross tonnage	Log base (vessel register)
Engine power (main engine)	Log base (vessel register)
Age of hull	Log base (vessel register)

The fishing fleet is segmented at the end of each calendar year by mechanical processing of the data reported in the log base (log books and vessel register). Data in respect of fishing capacity in accordance with the above are reported for each segment. The data must be updated once a year.

## Extended Programme

No data collection will be carried out within the framework of the extended programme.

### 2.2.D. Collection of data relating to fishing effort

Member States are required to collect data for estimating the fishing effort and fuel consumption in accordance with Commission Regulation (EC) No. 1639/2001, Appendixes V to X. Sweden will adhere to the minimum programme.

The aggregated data meet the requirements in respect of accuracy stipulated in Chapter 2. D.1.c. of the implementation regulation.

#### *Fuel consumption*

Calculations of the average annual fuel consumption expressed in volume units for vessels in the respective segments (as defined in Appendix III) and the average cost will be dealt with in the collection of economic data on the fishing fleet. See Chapter 4.1 Collection of economic data by groups of vessels.

#### *Fishing effort by type of fishing method*

Fishing effort defined as the sum of weighted (as defined in Appendix V) fishing days (as defined in D.1.a) with a particular fishing method (as defined in Appendix VIII) must be reported by specific area (Level 3 as defined in Appendix I).

In addition, the effort defined as the sum of weighted (as defined in Appendix V) fishing days (as defined in D.1.a) with a particular fishing method (as defined in Appendix III) must be reported by area (Level 3 as defined in Appendix I) and vessel length category (as defined in Appendix IV).

#### *Specific fishing effort*

Effort defined as the sum of weighted (as defined in Appendix V) fishing days (as defined in D.1a) with a particular fishing method (as defined in Appendix VIII) must be reported by division (as defined in Appendix I) and species (as defined in D.1a (iii) and as defined in Appendix VI).

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The following data are collected:

DATA	SOURCE
Fuel consumption	Log base (vessel register) Questionnaires
Fuel prices	Statistics Sweden (See Chapter 4.1)
Number of fishing days with a particular type of gear (as defined in Appendix III+IV)	Log base (log books and coastal journals)
Catching area (as defined in Appendix I)	Log base (log books and coastal journals)

Period	Log base (log books and coastal journals)
Quantity by species (as defined in Appendix VIII)	Log base (log books, coastal journals, sales notes and/or sampling)
Vessel length (as defined in Appendix III)	Log base (vessel register)

The fishing effort is estimated for every quarter by processing of reported data in the log base (log books, sales notes, sampling, vessel register, etc.). The result will be reported annually. A data application was developed in 2003 in order to facilitate the compilation of effort data.

### **Extended Programme**

No data collection will be carried out within the framework of the extended programme.

## **3. Module of evaluation of catches and landings**

### **3.1 E. Collection of data related to catches and landings**

Member States are required to report commercial landings of all stocks. The data must relate to the total landed quantity and must be reported by species sub-divided by catching area and by year. For the fish stocks specified in Appendix XII to Commission Regulation (EC) No. 1639/2001, details of the catch thrown overboard and the total catch must also be reported. The catch of salmon in recreational and game fisheries in the Baltic Sea must also be reported.

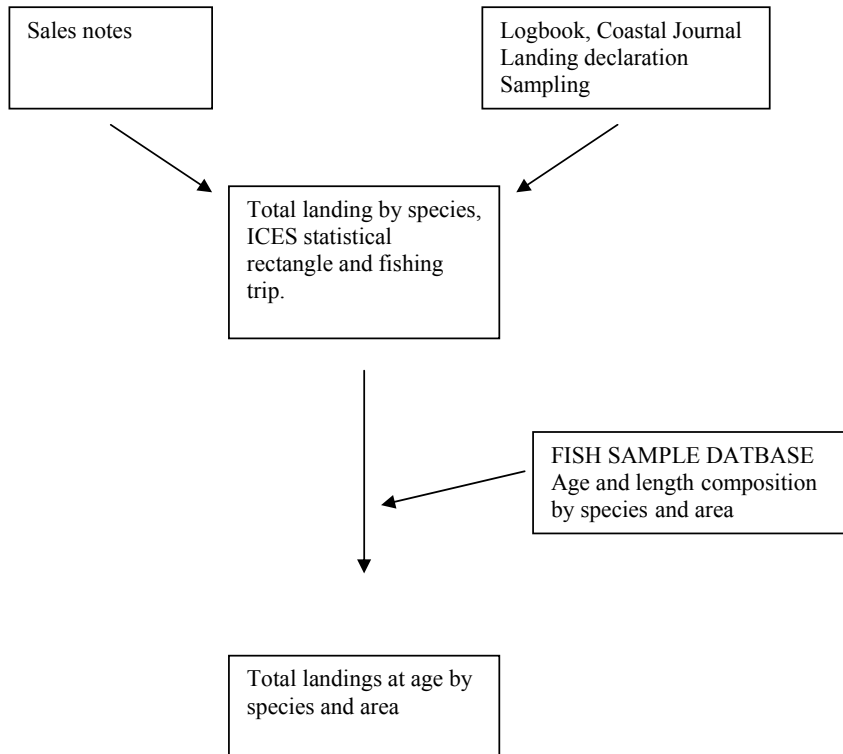
The geographical origin of catches and landings will be reported at level 2, Appendix I, in Commission Regulation (EC) No. 1639/2001. For stocks included in Appendix XII of the regulation, the aggregation level will meet the terms specified for the different areas. For the purpose of this programme, the North Sea, the Skagerrak, the Kattegat and the Baltic Sea will be taken as defined in Article 2 (4) of Council Regulation (EC) No 850/98.

The aggregated data meet the requirements in respect of accuracy stipulated in Chapter 3.E.1.c of the Commission Regulation.

Details of the landed quantity are collected from fishermen and first-hand buyers in accordance with Council Regulation (EC) No. 2847/93 establishing a control system applicable in the common fisheries policy. Data will reflect Swedish landings in Sweden and abroad and transshipment to third country vessels as well as other countries' landings in Sweden. Details in respect of the value of the landed quantities sub-divided by species are provided in the context of the economic data in accordance with Chapter 4.J. Catches and landings from vessels under ten meter (l.o.a.) are collected by a system with coastal journals. For most fisheries the information covers aggregated figures for a period of one month. Even fishing without a vessel, for

example from ice, is covered by this system. It is also possible to record discard information in the journal, however this is not mandatory. One journal contains 25 numbered forms and is sent out to all licensed fishermen. Every single form within the journal is bound to the licence.

The estimation procedure is illustrated by the flow diagram below.



For all stocks, the quantities landed in Sweden will be reported annually. The reported quantities will relate to the adjusted catch after having conducted a cross-checking of data from the log sheets, landing declarations, sales notes and sampling. Data relating to the species, quantity and catching area are taken from the database in which information from log sheets, sales-notes and other documentation are recorded and stored in accordance with Commission Regulation (EC) No. 2847/93.

### 3.1.1 Game and recreational fisheries

Due to the substantial volumes of Salmon in recreational fisheries, Sweden conducts a sampling programme for this.

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### **3.2 E. Swedish discard sampling**

According to Commission Regulation (EC) No. 1639/2001 Chapter 3.E.1.b Sweden is obliged to collect discard data in order to present estimates of discard rates for selected species. Since 1996 Sweden has systematically sampled discard data in the most important Swedish fisheries in the Baltic and the Kattegat. For the Skagerrak and the North Sea, Swedish discard sampling started in 1999. The monitoring has been carried out as studies supported by the Commission.

#### **3.2.1 Swedish sampling effort of relevant species and areas**

Appendix I contains a summary of the species and areas for which discard estimates are to be made according to Article H section e). The Swedish discard sampling effort given in Appendix I will be proportional to the fishing effort by strata and achieve the minimum levels given in Appendix XV Commission regulation EC (No) 1639/2001. Swedish discard sampling will cover the areas IIIb-d and IIIa.

Vessels to be monitored will be selected randomly among a large number of vessels >12 m. There is no authority in Swedish law, which gives the possibility to enforce the fishermen to have observers on board. Therefore, only vessels where the skipper has agreed on having observers on board will be sampled.

The sampling will be stratified on:

- ICES Division/ Sub-division
- Quarter
- Discard pattern in relevant fleets

The fleets will be defined on gear type and target species.

Data will be collected by staff from IMR, primarily by sampling on board commercial fishing boats, but also in ports during landing. In such cases, the part of the catch, which normally will be discarded, will be landed separate from the normal landing part of the catch and worked up and recorded. In this case the same information is collected and recorded as if an observer had been on board.

The information to be sampled is:

- Vessel and gear characteristics
- Place, date, time and duration of fishing operation
- Total weight of discard and landing by all species caught
- Separate length distributions of discard and landings by all relevant species caught. If the retained part of the catch is landed in commercial weight categories, separate length frequencies are obtained by category
- Otoliths per cm group of undersized fish (discard part of the catch) of selected species.

Weight measurements are generally recorded as un-gutted fish and the measurements are made on un-gutted fish. When gutted fish are used a weight conversion factor will be applied.

All collected discard data are recorded in the Fish sample database (see Section 1) at IMR.

### **3.2.2 International discard data storage**

All Swedish catch data sampled during discard sampling in the Kattegat and the Baltic Sea are included in the international common IBSSP database: BALTCOM. This database constitutes the backbone in the international discard calculations made for the area and is essential for the further development and international co-operation concerning discard.

All countries around the Baltic Sea submit data to the database and have full access to all data collected if the data are used for scientific purposes.

#### **Extended programme**

No data collection will be carried out within the framework of the extended program.

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### **3.3. F. Collection of data concerning the catches per unit effort and/or effective effort of specific commercial fleets.**

#### **Minimum programme**

Catch and effort data are collected in the National Programme (Sections 2 and 3) and are used internally within the different institutes. Our C.P.U.E. data for salmon and Norway lobster are also used within the relevant ICES working groups.

#### **Extended Programme**

No data collection will be carried out within the framework of the extended program.

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### **3.4 G. Eligibility of the scientific evaluation surveys of stocks**

The Swedish National Board of Fisheries commands two research vessels. The R/V ARGOS which is a 61 meter long stern trawler. IMR uses R/V ARGOS when conducting the Baltic International Trawl Survey (BITS), International Bottom Trawl Survey (IBTS) and the Herring Acoustic Survey.

Member States are required to conduct scientific research at sea to enable them to evaluate the size and distribution of the stocks, regardless of the data submitted by the commercial fisheries in relation to stocks for which such evaluations are possible and appropriate according to Commission Regulation (EC) No. 1639/2001. Sweden will undertake five surveys in the Baltic Sea, the Kattegat and the Skagerrak by using R/V ARGOS. These five surveys are of priority 1 and are included in the minimum programme as defined in Appendix XIV of Commission Regulation (EC) No. 1639/2001. Staff from IMR will in 2005 also participate in the international Norwegian Spring Spawning Herring Survey.

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The trawl surveys described in this programme are internationally co-ordinated and will remain so. The planning and co-ordination of the surveys are done in ICES working groups connected with the surveys (BITS Working Group, IBTS Working Group, WGBIFS Working Group, Herring Survey Planning Working Group).

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## Minimum programme

### 3.4.1 Baltic International Trawl Survey (BITS)

The survey is conducted twice during a year, in the 1<sup>st</sup> quarter (15 days at sea, 40 trawl stations) and one in the 4<sup>th</sup> quarter (10 days at sea, 30 trawl stations) with the research vessel ARGOS. The surveys cover area III d.

The primary purpose is to produce indices for recruitment and stock abundance of the Baltic cod stock. Sampling of individual cod includes fish length, age, weight, sex and gonadal maturity and is carried out on board the survey vessel. Data on gonadal maturity and individual weight are obtained to establish sex specific maturity ogives and mean weight at age for cod. The otoliths are analysed at IMR in Lysekil. Age determination takes place in accordance with standardised methods (Anon. 2000a).

The sampling procedure and the level of precision are defined in the Manual for the Baltic International Trawl surveys. ICES CM 2002/G:05(Addendum).

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The survey is ICES co-ordinated and performed in collaboration with research vessels from Denmark, Germany, Poland, Latvia and Russia. However, all countries are not involved in every survey. During the survey a TV3 bottom trawl is used at day-time. This gear is rather newly developed and is used as a standard by the countries involved. Hydrographical data are collected with a CTD.

Primary survey data are stored in a fish sample database administered by IMR in Lysekil. Aggregated data are reported and used annually by relevant ICES Working Groups. Since 1997, data are also stored in an international co-ordinated database at ICES in Copenhagen

### **3.4.2 International Bottom Trawl Survey (IBTS)**

The survey is conducted twice a year, one in the 1<sup>st</sup> quarter (15 days at sea, 45 trawl stations) and one in the 3<sup>rd</sup> quarter (15 days at sea, 45 trawl stations) with the research vessel ARGOS. The surveys cover area IIIa and are the Swedish part of the IBTS.

The purpose is to estimate abundance by age, in particular for the recruiting year classes of target species (cod, haddock, whiting, herring, sprat, Norway pout, mackerel and plaice) in the Kattegat and the Skagerrak. Sampling of target species includes fish length, age, weight, sex and gonadal maturity and is carried out on board ARGOS. The otoliths are analysed at IMR in Lysekil. Age determination takes place in accordance with standardised methods (Anon. 2000a).

The sampling procedure and the level of precision are defined in the Manual for the International Bottom Trawl Surveys ICES CM 2000/D:07.

The survey is ICES co-ordinated and performed in collaboration with research vessels from Denmark, Norway, Germany, Netherlands, England, Scotland and France. During the surveys, a GOV bottom trawl is used at day-time. This gear is a standard and used by all countries involved. A Method Isaac Kidd trawl is used at night-time in the quarter 1 survey to estimate the abundance of fish larvae, in particular herring- and sprat larvae. Hydrographical data are collected with a CTD.

The ICES IBTSWG recommends Sweden to change their sampling design in the Skagerrak because Sweden is not covering the entire area. However, the WG recognises the problem with breaking a long time series and suggest that Sweden keeps as much hauls as possible from previous years but at the same time tries to cover all rectangles with at least 1 haul where possible. It was also suggested that a sensitivity analysis should be made prior to change of sampling design. Therefore, in 2005 Sweden will extend the 3<sup>rd</sup> quarter survey by seven days.

Primary survey data are stored in a fish sample database administered by IMR in Lysekil. Aggregated data are reported and used annually by relevant ICES Working Groups. Since 1977, data are also stored in an internationally co-ordinated database at ICES in Copenhagen.

### **3.4.3 Herring Acoustic Survey**

The survey is conducted during the 4<sup>th</sup> quarter (15 days at sea, 40 trawl stations) with the research vessel ARGOS. The Swedish part of the survey covers area IIIId (sub-divisions 25-29S).

The purpose is to provide acoustic abundance estimates of herring and sprat in the Baltic Sea.

The sampling procedure and the level of precision are defined in the Manual for the Baltic International Acoustic surveys ICES CM 1994/H:3.

The acoustic abundance estimate is done in collaboration between Germany, Denmark, Poland, Russia, Latvia and Estonia. The herring and sprat are length measured on board and sent to IMR in Lysekil for further examinations such as age, weight, sex and gonadal maturity. Age determination takes place in accordance with standardised methods (Anon. 2000a).

Primary survey data are stored in a fish sample database administered by IMR in Lysekil. Aggregated data are reported and used annually by relevant ICES Working Groups. Since 2000, data have also been stored in an internationally co-ordinated database (EC 99/06) DFU in Hirtshals, Denmark.

#### 3.4.4. Norwegian Spring Spawning Herring Survey

Sweden will participate with two staff members during two weeks of the survey.

#### Extended programme

No data collection will be carried out within the framework of the extended programme.

#### 3.5 H. Biological sampling of catches: composition by age and by length and I. Other biological sampling

Member States are required to collect biological, random samples in order to evaluate the composition in length and where appropriate in age of landings for all stocks specified in Appendix XV in Commission Regulation (EC) No. 1639/2001 and for some species also other biological samplings.

Biological sampling must be performed if the Swedish TAC or total landings of a certain species exceed thresholds defined in 1639/2001 Chapter H.1(d). Appendix II shows the landings made in Sweden by Swedish flagged vessels and by other Member States flagged vessels. Information on Swedish and total EU TAC is given for each stock as a three-year average (2001-2003).

The purpose of the biological sampling of catches is to estimate the number of fish and their mean weight at age of the landings made in Swedish fishing ports. The data provide the basis, together with data from other fishing nations, for analysis of historical exploitation and for forecasts of future catches. Number of fish and their mean weight at age of all stocks included in the Swedish Programme (except Pandalid shrimps and Norway lobster) will be estimated by a standardised method, which also estimates variance of the parameters mentioned using boot-strap technique. This will assure that all calculations are made equal for all stocks.

Biological sampling is performed by different laboratories within Sweden. For most stocks included, sampling is covered by IMR in Lysekil and Karlskrona. All data sampled by IMR will be stored in a fish sample database at IMR in Lysekil. Most

**Deleted:** Formal plans have not yet been decided on, nor what research vessel that should be used, but Sweden is willing to participate with staff. A provisional budget is included but the final figures have to be negotiated once the survey programme has been finalised.

#### Deleted: 3.4.5. Salmon river survey

Baltic salmon has been sampled as indicated by the minimum programme in Commission Regulation (EC) No. 1639/2001, prescribing market sampling of catches as the only monitoring of the stocks. SGRN noted as a general comment that the absence of river surveys made the MP inadequate to assess if the agreed management objectives are achieved (SEC 200, Brussels 9-13 December 2002). Therefore, in 2004, the Swedish NP will include river surveys and they will run with an even sampling intensity in 2004-06. The survey programme will be decreased if the proposed surveys are not included in the MP after revision of Regulation 1639/2001.

There are 14 Baltic wild salmon rivers in Sweden and 2 nationally appointed creel rivers where salmon is re-introduced in accordance with the agreed management plan. The status of the stocks in these rivers will be monitored by surveys which include three elements: counts of spawners, surveys of juveniles by electrofishing and smolt trapping.

Counting of spawners takes place in fish ladders for ascending fish. Fish ladders exist in several Swedish salmon rivers and fish counts from these ladders are collected manually or by automatic counters. The data from fish ladders are of variable quality, which makes them difficult to use. The survey programme will consist of collecting high quality data from counting systems in at least four rivers over the entire season when salmon enter the rivers. Data are collected ... [1]

#### Deleted: 3.4.4 Atlanto/Scandinavian Herring Survey

The EU-survey is conducted during the 2<sup>nd</sup> quarter (30 days at sea, 15 trawl stations, 35 CTD stations) with either the research vessel Tridens or Walter Herwig. The survey covers area IIa.

The EU-survey is done in collaboration with Denmark, Germany and Netherlands.

The surveys are ICES co-ordinated and since 1998, a series of 8-10 surveys are carried out every year by Faroese, Icelandic, Norwegian, Russian, and EU-research vessels in spring and summer in Norwegian and Barents Sea.

The main objectives of the co-ordinated surveys are to map the distribution and migration of the herring and other pelagic fish, and to monitor environmental ... [2]

species included in the extended programme in the Baltic are sampled and recorded by the Institute of Coastal Research, and salmon stocks in the Baltic by the Institute of Freshwater Research, but in close co-operation with IMR.

### 3.5.1 The Swedish standard sampling procedure

The standard sampling procedure will be carried out on a quarterly basis by ICES division in the main fishing ports where landings take place. Standard samples are collected from catches, which are sorted in commercial weight categories. Random samples are collected within each category. In order to achieve an “accepted” level of precision even though landings are small, (particularly on weight categories 1-3), a fixed number of samples will be collected within sampling strata (strata= quarter, ICES Division, gear, weight category). However, total number of samples collected during a year for a stock will follow the sampling rules based on annual landings which are outlined in Appendix XV in Commission Regulation (EC) No 1639/2001. With sampling rules outlined in Appendix XV, a precision level is set. The minimum Swedish sampling level for each stock is given in Appendix II.

The samples are normally analysed in the fishing ports, but some samples are analysed at the different laboratories. All individuals in a sample are analysed according to the standard measures:

- Length
- Weight
- Age

Age determination always takes place at the laboratories according to standardised methods (Anon. 2000a).

The intention of ‘Other biological sampling’ is to describe annually the distribution by sex, sexual maturity, fecundity and spawning biomass by age and by sex for some fish stocks. The parameters mentioned in Chapter III I.(1)(a)(i) and (iii) will be sampled on all species during surveys and from landings of cod in the Kattegat. Samples of herring are subject to the parameters mentioned in section 1(a) (i) and (ii) as an improvement of the estimation of spawning stock biomass and recruitment to the spawning stock. Precision levels for these parameters are outlined in the Commission Regulation (EC) No 1639/2001 Chapter III I. (1) (c). The level of precision for the parameters collected during a survey is a result of the sampling strategy outlined in the internationally agreed manual existing for each survey. The accuracy of these parameters is applicable to aggregated data at an international level according to Chapter III I (1)(d)(2).

A description of each stock that is included in the Swedish sampling is described below, following the structure: The Swedish landings, the Swedish TAC of the EC shared TAC in percent and a short description of the fishery. The sampling procedure is described if it deviates from the standard sampling procedure described above following by a short description of how other biological sampling is performed. More information on Swedish sampling on catches is given in Appendix II.

## **Minimum Programme**

### **3.5.2 The Baltic Sea ICES AREA IIIb-d**

#### **Cod**

The Swedish landings of cod from areas IIIb-d in 2003 were 14 545 tonnes, obliging Sweden to sample this stock.

Cod in the Baltic Sea is regarded to be two different stocks: the Western stock (sub-divisions 22-24), and the Eastern stock (sub-divisions 25-32). Biological sampling and results are reported by stock.

The cod fishery in the Baltic is conducted mainly with trawls and gill-nets, but also long-lines are used with increasing intensity. The bottom trawling is conducted during day-time at 30-100 meters depths all year round with exception of the summer stop (June, July and August). The optimum temperature range for adult cod is at 6-8 C°. By using temperature sensors on the trawl most of the fishing is done at depths within the optimum temperature range.

The gill-net fishery is conducted primarily by smaller vessels, fishing along the coast. Each vessel uses 4-6 km gillnets.

Sampling of cod follows the standard sampling procedure. Cod are sorted with respect to weight, in accordance with EU standard 1-5. The proportion of fish landed in size categories 1-3 is small and is thus sampled as one single category. Sampling of the Western and Eastern stocks takes place in fishing ports situated in Karlskrona, Nordersund, Simrishamn and the islands of Gotland and Öland.

The Swedish sampling of cod in the Baltic can be considered over-sampled in relation to the Minimum Programme requirements. The additional sampling is based on the fact that the Western and the Eastern stocks must be sampled separately and that trawl, gill-net and long-line fisheries are separated as well.

Sampling of other biological parameters (including fish length, age, weight, sex and gonadal maturity) is carried out on board R/V ARGOS during the BITS surveys conducted in the 1<sup>st</sup> and 4<sup>th</sup> quarters and supplements the sampling of landed cod. Sex and maturity are determined following the international 5 scale maturity key.

Collected data are stored in a fish sample database at IMR. Results are reported annually to the ICES Working Group (WGBFAS).

#### **Herring IIIId**

The Swedish officially reported landings in 2003 were 39.3 thousand tonnes, obliging Sweden to sample this stock.

Herring is caught mainly in pelagic trawls, but also in bottom trawls and in the coastal zones during spawning season also in gill-nets. The herring fishery takes place in all seasons, but is more intensive during winter and spring. The majority of the catch is landed for industrial purposes.

Sampling is sub-divided between two fishing fleets:

- a/ herring fisheries with bottom trawls or ring nets with  $\geq 32$  mm mesh size,
- b/ mid-water trawl fisheries with both  $<32$  mm and  $\geq 32$  mm mesh, which land herring mainly for industrial purposes.

Standard sampling procedure as described in 3.5.1 is performed on both fishing fleets, except that samples are taken from unsorted catch. Samples from fishing fleet b/ are collected by the Swedish Coast Guard during their standard control of the pelagic fishery regarding species composition. Samples from fishing fleet a/ are purchased, and all samples are transported to IMR in Lysekil for analysis.

Sampling of other biological parameters such as sex and gonadal maturity is performed on fishing fleet a/. Sampling of fishing fleet b/ includes no adequate sampling by sex and by sexual maturity, because in principle all landings are intended for the fish-meal and oil industry. The samples are thus not suitable for anatomical/histological examination. The parameters are also collected during the Herring Acoustic survey conducted in 4<sup>th</sup> quarter. Sex and maturity are determined following the international 8 scale maturity key.

Collected data are stored in the fish sample database at IMR. The results are reported annually to the ICES Working Group (WGBFAS).

### **Sprat IIIb-d**

The Swedish officially reported landings in 2003 were 73.6 thousand tonnes, obliging Sweden to sample this stock.

The Swedish sprat fishery in the Baltic Sea is conducted with mid-water trawl with  $<32$  mm mesh size and the catches are mainly landed for industrial purposes. The fishery is most intensive during winter and spring.

Samples are collected by the Swedish Coast Guard during their standard control of the species composition in the pelagic fishery. Samples are transported to IMR in Lysekil and analysed using standard procedure described in 3.5.1, except that samples come from unsorted catch. Data (age, length and weight) on sprat are also collected at the Herring Acoustic Survey conducted in the 4<sup>th</sup> quarter.

Data are stored in the fish sample database at IMR.

No adequate sampling for other biological parameters is conducted because in principle all landings are intended for the fish-meal and oil industry. The samples are thus not suitable for anatomical/histological examination.

### **Salmon IIIb-d**

The Swedish quota was on average 123 000 salmon during the years 2001-2003, which represented 36% of the available EC TAC for the Baltic Sea (excl. the Gulf of Finland). These landings oblige Sweden to sample this stock.

Sampling in ICES sub-divisions 25-29S takes place in major landing ports for salmon. The sampling of salmon is following the standard sampling procedure described in 3.5.1. Scale samples are taken for age determination.

Sampling is planned according to the previous year's fishing pattern and it is concentrated on salmon caught by drift-nets (80% of the catch) but also long-line catches will be examined.

Sampling in the northern and southern parts of the Gulf of Bothnia (ICES sub-area 29N-31), is performed by the fishermen themselves in four sections of the coast, off Nordmaling, Skellefteå, Kalix and Haparanda.

The purpose of other biological sampling is to determine the proportion of wild and reared salmon in the landings. Scale characters are used to determine whether the salmon is of wild or reared origin. These data are collected in conjunction with the age determination of the sampled salmon. No data relating to the proportion of sexually mature salmon or the sex-ratio, are collected in the southern Baltic. A new element is that DNA analysis will be carried out for validation of scale analyses in 2004-06. The same technique is used in Finland and a comparison and validation of the technique will be carried out between Finnish and Swedish laboratories.

**Deleted:** SGRN indicated that river monitoring should be included in the Swedish NP (SEC 200, Brussels 9-13 December 2002). From 2004 and onwards, sampling will be carried out in four different rivers; Dalälven, Sävarån, Ume/Vindelälven and Mörrumsån.

Salmon data are sub-divided by length and age and are stored in a database administered by the Institute of Freshwater Research. Sampling results are reported annually to the ICES Working Group (WGBAST). Primary data from genetic analyses will be stored in a database administered by the Institute of Freshwater Research.

### **3.5.3 Kattegat and Skagerrak ICES AREA IIIa South and North**

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#### **Cod**

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The Swedish landings in 2003 were 848 tonnes in the Kattegat and 587 tonnes in the Skagerrak, obliging Sweden to sample both stocks.

Cod in the Kattegat and the Skagerrak is caught mainly in bottom trawls, both in directed fishery for fish but also as by-catch in Nephrops fishery. Cod is also caught in directed gill-net fishery. The major part of the catch is taken during the 1<sup>st</sup> and 4<sup>th</sup> quarters. Sampling of cod is performed in the fishing ports in Bua and Göteborg.

Standard sampling procedure is followed as described in 3.5.1. Cod are sorted according to weight, as defined in EU standard 1-5. The proportion of fish landed in size categories 1-3 is small and is thus sampled as a single category.

Sampling of other biological parameters (includes fish length, age, weight, sex and gonadal maturity and fecundity) is carried out on board R/V ARGOS during IBTS surveys conducted in the 1<sup>st</sup> and 3<sup>rd</sup> quarters and supplements the sampling of landed cod. Sex and maturity are determined following the international 4 scale maturity key.

The data are stored in the fish sample database at IMR and the results are reported annually to the ICES Working Group (WGBFAS) for data on cod in the Kattegat and (WGNSSK) for data on cod in the Skagerrak.

## **Herring**

The total Swedish herring catch in area IIIa was in 2003 34,1 thousand tonnes, obliging Sweden to sample this stock.

Sampling of herring in IIIa takes place by spawning stock (Chapter III.I.1.a.ii).

Herring in IIIa consist of:

- a/ autumn-spawners from the North Sea
- b/ spring-spawners from the Western Baltic Sea
- c/ local winter and spring-spawning stocks.

The size of these stocks varies between years, seasons and age groups. The variations are evaluated annually with the help of special biological sampling. From 1990 onwards, two spawning stocks are identified: autumn-spawning and spring-spawning herring.

Since 1990, sampling has been divided between two fishing fleets:

- a/ herring fisheries with trawls or ring nets with >32 mm mesh size,
- b/ purse seine fisheries with <32 mm mesh and other fisheries with <32 mm mesh which land herring mainly for industrial purposes.

Sampling on fleet a/ is purchased and transported to IMR in Lysekil for analysis. Sampling on fishing fleet b/ is performed by the Swedish Coast Guard and transported to IMR for analysis. Standard sampling procedure is used as described in 3.5.1 except that sampling is performed on unsorted catch.

The purpose of the other biological sampling is to estimate on a yearly basis the distribution by sex and maturity per age and spawning stock. Identification of spawning stocks takes place on an individual basis.

Sampling of fishing fleet a/ includes supplementary data by sex and gonadal maturity. The spawning type is determined by analyses of otoliths and vertebra in individual fish. Sampling of fishing fleet b/ includes no adequate sampling by sex and by sexual maturity, because in principle all landings are intended for the fish-meal and oil industry. The samples are thus not suitable for anatomical /histological examination. Samples of other biological parameters are also collected during IBTS surveys conducted in the 1<sup>st</sup> and 3<sup>rd</sup> quarters. Sex and maturity are determined following an 8 stage international key.

Data are stored in the fish sample database at IMR. The results are reported annually to the ICES Working Group (HAWG).

### **Sprat**

The Swedish landings in 2003 in area IIIa were 8.4 thousand tonnes obliging Sweden to sample this stock.

More than half of the landings originate from fisheries in the Skagerrak.

Sampling is sub-divided into fish for human consumption and fish for industrial purposes.

a/ Sprat for human consumption is caught with fine-mesh purse seines and ring nets mainly during autumn and winter in the Skagerrak.

b/ Fisheries for fish for industrial purposes take place throughout the year using ring nets, mid-water trawls and bottom trawls.

Sampling from the human consumption fisheries a/ is performed on landings from representative purse seine boats during the 1<sup>st</sup> and 4<sup>th</sup> quarters. Sampling of animal feed fisheries b/ is performed all year round on landings made at the fish-meal factory on Ängholmen. Standard sampling procedure is used as described in 3.5.1 except that sampling is performed on unsorted catch.

The purpose of the other biological sampling is to estimate on a yearly basis the distribution by sex and maturity per age and sex.

Samples from the human consumption fisheries are purchased and transported to IMR a/. Sampling includes supplementary data relating to sex and gonadal maturity. Samples of the animal feed fisheries b/ are collected by the Swedish Coast guard and include no adequate sampling by sex and by gonadal maturity because in principle all landings are intended for the fish-meal and oil industry. The samples are thus not suitable for anatomical /histological examination.

Supplementary data relating to sex and gonadal maturity together with data relating to age, weight and length, are obtained from non fisheries-dependent studies on board R/V ARGOS during IBTS surveys in the 1<sup>st</sup> and 3<sup>rd</sup> quarters.

The data are stored in the fish sample database at IMR. The results are reported annually to the ICES Working Group (HAWG).

### **Plaice**

The Swedish landings in 2003 were 248 tonnes in the Kattegat and 142 tonnes in the Skagerrak. Plaice in the Kattegat and the Skagerrak are assumed to belong to the same stock. These landings oblige Sweden to sample this stock.

Plaice are caught in trawls, Danish seines and gill-nets. Catches are taken all year round. Sampling of plaice is carried out in the fishing port in Göteborg. The sampling

of plaice follows the standard sampling procedure described in 3.5.1. Plaice are sorted in respect of weight, as defined in EU standard 1-4. Size categories 1 and 2 are sampled as one size class due to few fish landed.

Sampling of other biological parameters is conducted on board R/V ARGOS during IBTS surveys in the 1<sup>st</sup> and 3<sup>rd</sup> quarters and supplements the sampling of landed plaice.

Data are stored in the fish sample database at IMR. Results are reported annually to the ICES Working Group (WGNSSK).

### **Haddock IIIa N**

The Swedish landings in 2003 in area IIIa were 231 tonnes, obliging Sweden to sample this stock. Sampling of this stock must only include fish length according to exemption provision in Chapter III.H (1) (d).

Haddock is landed all year round and only for human consumption purposes. Haddock is caught in bottom trawls, Danish seines and gill-nets.

The sampling of haddock is not following the standard sampling procedure. Sampling of haddock caught in the Skagerrak is carried out on board fishing boats and includes only length measurements on unsorted catch. Only undersized individuals are sampled for age.

The purpose of the other biological sampling is to estimate on a yearly basis the distribution of sex and maturity per age. Sampling of other biological parameters such as fish length, age, weight, sex and gonadal maturity, is carried out on board R/V ARGOS during IBTS surveys conducted in the 1<sup>st</sup> and 3<sup>rd</sup> quarters and supplements the sampling of landed haddock.

Data are stored in the fish sample database at IMR. Results are reported annually to the ICES Working Group (WGNSSK).

### **Mackerel**

The Swedish landings were for 2001-2003 on average 4 847 tonnes, obliging Sweden to sample this stock. However, on average 94% of the landings were made in Denmark and Norway and no sampling in Sweden is planned for 2005.

### **Norway lobster**

The Swedish landings in 2003 were 893 tonnes, obliging Sweden to sample this stock.

The purpose of biological sampling of catches is to yearly estimate the number of Norway lobsters and their average weight by length in Swedish catches.

The fishery for Norway lobster (*Nephrops*) is mainly conducted in the Skagerrak, using *Nephrops* trawls and crustacean-creels.

Sampling of Norway lobster is not following the standard sampling procedure and differs between the two areas. In the Kattegat sampling is carried out on board commercial Norway lobster trawlers (single and/or paired trawlers) and is performed by personnel from IMR. Sampling is performed on the sorted catch, i.e. both on the proportion of the catch to be landed and the proportion to be discarded, and includes length measurement of the carapax.

In the Skagerrak, four to six Norway lobster trawlers (single and/or paired trawlers) and two to three crustacean-creel fishermen are selected at random from the register of vessels and are contacted one to two times per month. The contacted fishermen are asked to retain that proportion of their catch which would otherwise be thrown overboard (small, soft, brown and damaged) from a single haul of the trawl. Personnel from IMR then visit the fish auction at Smögen to measure the length of the landed Norway lobsters, collect the samples of discard and the fishermen's notes on the discarded/landed weight ratio and data relating to the fishing ground.

The vessels which provided the discarded quantity, are also sampled in respect to the proportion that was landed. Landed Norway lobsters in a single box (ca. 20 kg) are measured for length over the carapax. The discard sample (max. 15 kg) is transported to the laboratory for analysis.

Other biological parameters such as sex and gonadal maturity are sampled as supplementary data on females for those individuals which are measured for length, in accordance with the procedure described above.

Data are recorded and stored at IMR. The results are reported annually to the ICES Working Group (WGNEPH).

### **Pandalid shrimps IIIa N**

The Swedish landings in 2003 were 2035 tonnes, obliging Sweden to sample this stock.

The purpose of biological sampling of catches is to estimate annually the number of prawns and their average weight by length and age in Swedish catches.

The pandalid shrimps are caught in trawls fishing at 150-400 meters depth. The catch is sorted on board according to size. The fraction of larger shrimps is boiled on board, the middle fraction landed fresh to the canning industry and the smallest shrimps are discarded.

The sampling of shrimps is not following the standard sampling procedure. Samples from both parts of the landings are purchased and transported to IMR for analysis of carapax length and weight.

Sampling of other biological parameters such as sex and gonadal maturity comprises supplementary data on the individuals whose length is measured in accordance with the procedure described above.

Data are stored at IMR. The results are reported annually to the ICES Working Group (WGPAND).

### Extended programme

Collection of data according to Chapter H. Biological sampling of catches: composition by age and length, and Chapter I. Other biological samplings, will be carried out within the framework of the extended programme for the stocks:

- Turbot IIIb-d
- Norway lobster IIIa
- European whitefish III d
- Pikeperch III d
- Pike III d
- Perch III d
- Flounder IIIa
- Flounder IIIb-d
- Eel IIIa
- Eel IIIb-d

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Sampling procedures for Norway lobster will be as described above. However, sampling intensity will be performed at the levels outlined in the extended programme, shown in Appendix III. Sampling procedure for the other species in the Baltic is explained below.

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### Turbot IIIb-d

Swedish landings in 2003 were 37 tonnes are locally of considerable significance for the small-scale coastal fisheries. The fishery is not subject to quotas. The landings have decreased from the top values in the mid nineties with catches over 200 tonnes and misgivings have been expressed about over-fishing, although it has not been possible to evaluate these due to the lack of biological data.

Although the division into sub-stocks is uncertain, the stocks in the central and northern parts are considered to be local. Turbot in this area spawn in the shallow waters close to the coast, and this is reflected in the fisheries, which land the largest catches in conjunction with the spawning period during summer. The most extensive fisheries are conducted in sub-division 28, in the shallow area to the east and south of the island of Gotland, representing 40% of total Swedish landings. The second most important fishery area (30% of total landings) is SD 25, southern Öland and the Bornholm Basin. This provides sufficient reason for Sweden to conduct biological sampling on the stock in these areas.

The fishery is operated almost exclusively with turbot gillnets (large-mesh nets) on the seabed. The extensive nature of the fishery and its isolated location in the middle of the Baltic Sea justify the establishment of a system for biological sampling in the area east of the island of Gotland. To enable evaluation of geographic stock variation an additional area chosen for sampling is SD 25. Stratified sampling is conducted in co-operation with the fishermen in the area. At least two fishermen conduct length measurements on board the vessel, divided into landed size grades and fish below the legal minimum size (30 cm). Fish intended for age analysis are collected by the fishermen and frozen for storage and future preparation in the laboratory of otoliths and recording of their lengths and weights. The fishermen keep a detailed log of the fishing effort, the mesh size in their gear, fishing grounds and catches sub-divided by size grades.

The fishery is concentrated to the 2<sup>nd</sup> and 3<sup>rd</sup> quarters and the collection process is adapted to this fishing pattern. Sampling includes the length measurement of at least 100 fish per vessel, size grade and month. The total weight of the sub sample that is measured for length is recorded. Age samples are taken at random from 100 fish by size grade, and area, including fish below the minimum size.

Age determination takes place in accordance with standardised methods (Anon. 2000a).

Sampling of other biological parameters such as sex and gonadal maturity comprises supplementary data to describe the distribution by sex and by age and sexual maturity by age and sex.

Data are stored in a database administered by the Institute of the Coastal Research in Öregrund. Sampling results and aggregated data will be reported annually to the ICES Working Group (WGBFAS).

### **European whitefish (*Coregonus lavaretus*)**

Commercial whitefish fishery is most intensive in ICES subdivisions 30 (Bothnian Sea) and 31 (Bothnian Bay). In recent years, the annual whitefish catch in the coastal areas in Sweden has been about 200-300 tonnes, being 278 tonnes in 2003. In 2003, 39% of the total whitefish catch was taken from subdivision 30 and 46% from subdivision 31. Whitefish is also caught in subdivisions 29 and 27, with catch proportions of 7% each. The dominating gear type in all areas is gill-nets with mesh-sizes between 25 and 65 mm bar length. In total, about 54% of all whitefish is caught with gill-nets and 44% with various types of trap nets.

There are at least two whitefish forms in the sea area of Sweden, the river-spawning migratory whitefish and sea-spawning whitefish. Usually the catches consist of both forms, the migratory whitefish being more common. Pure samples of each whitefish form can only be obtained from spawning populations.

The biological sampling should cover both whitefish forms and gear types. Most of the gill-net catches (63%) are taken with mesh-sizes between 36 and 45 mm bar length, about 28% with meshes larger than 45 mm and only 9% with mesh-sizes

smaller than 36 mm. Selectivity of different mesh-sizes vary considerably, and therefore the sampling covers all three mesh-size categories. The number of samples calculated according to the Commission Regulation (1 sample per 100 tonnes landings) is not sufficient to guarantee a successful assessment of the whitefish stocks, given the different gear types and whitefish forms.

Sampling is weighted according to fishing method and expected landings in each subdivision. The annual sampling scheme consists of 46 samples (2300 individuals) covering gill-net and trap net catches in Sub-divisions 27, 29, 30 and 31 (Appendix IV). Simple random sampling is applied. Each individual will be measured for length and in total of 1050 individuals will be aged. The sampling scheme will be modified annually, depending on catch rates and fishing activities.

Number of whitefish samples to be collected by ICES Sub-division, gear type and quarter weighted by catch rates in 2003 (one sample corresponds to 50 individuals):

### **Pikeperch (*Sander lucioperca*)**

The annual pikeperch catch in Sweden varies between 20 and 70 ton. The catches have steadily declined since 1997 being 35 tonnes in 2003. The commercial pikeperch catch is taken mainly with gill-nets in spring, summer and autumn. The majority (96 %) of catches are taken in subdivisions 27 and 29N. About 90 % of the catches are taken with gill-nets. Mesh sizes between 28 and 60 mm (bar length) are used, but mesh sizes over 45 mm are dominating the catches (87 % of the catches). The sampling is thus only needed of gill-nets with mesh sizes over 45 mm.

Sampling is weighted according to fishing method and expected landings in each subdivision. The annual sampling schedule consists of 6 samples and 300 individuals (Appendix V). Simple random sampling is applied. Each individual will be measured for length and aged. To improve the accuracy of age readings, both otoliths and scales are used in age readings. The sampling scheme will be modified annually, depending on catch rates and fishing activities.

Number of pikeperch samples to be collected by ICES Sub-division, gear type and quarter weighted by catch rates in 2003 (1 sample corresponds to 50 individuals):

### **Perch (*Perca fluviatilis*)**

The total commercial perch catch varies between 100 and 160 tonnes annually, and was about 108 tonnes in 2003. The perch catch is taken mostly with gill-nets (53 %) and trap nets (44 %) in spring, summer and autumn. Some fyke net catches occur in subdivision 27 (4% of total perch catches). In 2003, 46 % of the catches were taken in subdivision 31 (Bothnian Bay), 26 % in subdivision 30 (Bothnian Sea), 18 % in subdivision 27 and 8 % in subdivision 29N.

The number of samples based on the extended program C3 (2 samples, 100 individuals) is not adequate to cover sampling of all gear types and catch areas. Gill- and trap net catches of perch differ from each other in terms of size selectivity, and

therefore both gear types must be covered in the sampling programme. Mesh sizes between 20 and 60 mm bar length are used in the gill-net fishery, but the majority of the catches are taken with mesh-sizes over 38 mm.

Sampling is weighted according to fishing method and expected landings in each subdivision. The annual sampling schedule consists of 24 samples (1200 fish) in ICES subdivisions 27, 29N, 30 and 31 (Appendix VI). Simple random sampling is applied. Each individual will be measured for length and in total of 650 individuals will be aged. The sampling scheme will be modified annually, depending on catch rates and fishing activities.

Number of perch samples to be collected by ICES Sub-division, gear type and quarter weighted by catch rates in 2003 (1 sample corresponds to 50 individuals).

### **Pike (*Esox lucius*)**

The total commercial pike catches have declined from 80 tonnes 1999 to about 40 tonnes in 2003. The **majority of the catches are taken with** gill-nets (63% of total landings). Pike is also caught with trap nets in subdivision 31 (Bothnian Bay). In 2003, 39% of the catches were taken from SD 31, 27% from SD 27 and 15% in SD 25.

Sampling is weighted according to fishing method and expected landings in each subdivision. The annual sampling schedule consists of 15 samples (750 fish) in ICES subdivisions 25, 27, 29N, 30 and 31 (Appendix VII). Simple random sampling is applied. Each individual will be measured for length and aged. The sampling scheme will be modified annually, depending on catch rates and fishing activities.

Number of pike samples to be collected by ICES Sub-division, gear type and year quarter weighted by catch rates in 2003 (1 sample corresponds to 50 individuals).

### **Flounder (*Platichthys flesus*)**

In recent years, the total commercial flounder catches have varied between 200 and 500 tonnes annually being 273 tonnes in 2003. Flounder is caught mainly in ICES subdivisions 25 (38% of total landings in 2003), 27 (21%), 28 (6%) and 23 (11%). The majority of the catches (57%) is taken with gill-nets and a large amount, 38% of the total landings, is taken as a by-catch in demersal trawling.

Sampling is weighted according to fishing method and expected landings in each subdivision. The number of samples based on the extended program D3 (two samples, 100 individuals) is not adequate to cover sampling of all gear types and catch areas. The annual sampling schedule consists of 28 samples (1400 fish) in ICES subdivisions 21, 23, 24, 25, 27 and 28 (Appendix VIII). Simple random sampling is applied. Each individual will be measured for length and in total of 950 fish will be aged. To obtain highest possible standard in age reading, a method of sectioning the otoliths will be used. The sampling scheme will be modified annually, depending on catch rates and fishing activities.

#### **Deleted: Vendace (*Coregonus albula*)**

Vendace is fished for roe mainly in Subdivision 31 (Bothnian Bay) during September-October. The annual catches have varied from the lowest recorded, 370 tonnes, in 1998 to 970 tonnes in 2002. The catches are taken with demersal trawl by pair-trawling.

Annual sampling consists of 16 samples. Simple random sampling of 10 kg fish is applied. Sampling is weighted according to catches in different bays within Subdivision 31, and covers the whole fishing period (about one month). The annual number of length measurements is between 1000 and 1100 individuals and age determinations between 400 and 500 individuals.



Fixed costs	Average cost	- company accounts/income tax declarations (vessel owners) - calculated costs on replacement value or insurance value
Financial position	Share of own / foreign capital	- company accounts/income tax declarations (vessel owners) - questionnaire (vessel owners)
Investment	Value	- company accounts/income tax declarations (vessel owners) - calculated replacement value
Prices/species	Value/quantities	- Logbooks (NBF) - Sales notes (NBF)
Employment	Number	- questionnaire (vessel owners)
Fleet	Number GT KW Age Gear used	- vessel register (NBF) - Logbooks
Effort		- Vessel register (NBF) - Log books (NBF)

The fishing fleet will be divided into the data collection segments as defined in annex III of the regulation. In 2003 seven separate economic segments were identified:

1. Demersal trawl and seiner < 12m
2. Demersal trawl and seiner 12-<24m
3. Demersal trawl and seiner >=24 m)
4. Pelagic trawl and seiner < 24 m
5. Pelagic trawl and seiner >=24 m
6. Dredges and fixed nets 12- < 24
7. Passive gears < 12

When selecting companies to be included in the sample group (company accounts/questionnaire), segments 1-6 will be divided into subgroups based on catch composition (quantities/values). Simple random sampling will be used as a first option when selecting companies in each stratum (subgroup)<sup>2</sup>. The number of sampled companies will be based on the accuracy (precision levels) attained in previous years. All compiled data from the sample group will be processed with data on all catches and total landed values for the different subgroups. For these latter data, the coverage is approx. 100 %. In all, segments 1-6 represent more than 95% of total landed value.

In the segment for vessels less than 12 m using passive gear the fisheries differ from region to region and are very heterogeneous in terms of type of vessel (open boats decked boats etc), gear and catch composition. The segment comprises catches of all kinds of species and the various fisheries show very different earnings between regions and, also within regions, between companies. In addition, the companies are

<sup>2</sup> Some of the subgroups of vessels will be used to compile data for another set of segments (see the extended programme).

generally very small and the fishermen often have additional sources of income (agriculture, crafts etc) which make it very difficult to get accurate economic figures on the fishing activity. From logbooks, sales notes and the fishing vessel register, however, data on catch composition, value of landings, capacity and effort will be collected for all vessels. Data on other parameters will mainly be collected for cod-netters in the Baltic Sea (300 vessels).

Data will be processed in database programmes (Excel/Access) and a programme for data management and statistical analysis (SPSS).

Data will be presented as averages per vessel as well as aggregated for each segment. Price information will be on a quarterly basis.

### Extended programme

The following additional data will be collected:

Description	Parameter	Source
Income	Total and per species	- Sales notes (NBF) - Logbooks (NBF)
	- Monthly - Stock - Market category	- Company accounts/income tax declarations
	- subsidies	- Company accounts/income tax declarations - Fisheries structural aid database (NBF)
Production costs	Remuneration	- Company accounts/income tax declarations
	- Vessel owner (profit) - Crew	- Questionnaire (vessel owners)
Prices/species	Value/quantities	- Logbooks (NBF)
	- Monthly - Market category	- Sales notes (NBF)
Fleet	Sub-segments	- Vessel register (NBF) - Logbooks

The objective is to differentiate the data regionally. The calculations will be based on compiled data in the minimum programme. Data according to the table will be collected for all segments of the minimum programme as well as processed for another set of segments based on catch composition (in addition to type of vessel and gear). The information on this other set of segments will make it easier to study the link between the market situation and the profitability for the various types of fisheries.

The extended programme segments:

1. Pelagic vessels < 24 m
2. Pelagic vessels >=24 m
3. Trawlers, shrimp
4. Trawlers, Nephrops

5. Trawlers, < 24 m
6. Trawlers, >= 24 m
7. Gill netters, >=12
8. Gill netters, cod<12

#### 4.2. K. Collection of data concerning the processing industry

##### Minimum programme

The data collection will be based on official statistics (Statistics Sweden) which is the only way of producing reliable and accurate statistics with reasonable costs. The information from Statistics Sweden will be processed in order to be in line with the data collection programmes.

The Swedish processing companies are not classified into primary and secondary processing. A separation is not possible, as many companies operate both as primary and secondary processors. Naturally the industries could be separated according to their main occupation but it will require heavy costs and the benefits do not justify that.

##### Available information of the parameters included in Appendix XIX.

- **Raw material, total and per species:** The raw material in the processing industry is very diverse, ranging from round, fresh cod and herring to salted roe in barrels. The total value of raw material can be calculated from official statistics with a rather good accuracy but the volume in tons is practically impossible. The statistics does not distinguish, what is used for direct consumption and what is input into industrial processing neither in the export/import statistics, nor in the landings. In addition the raw material cost for the industry is calculated at enterprise level which means that the same raw material will be calculated more than once if the processing companies sell their output for further processing. In spite of these difficulties it should be possible to calculate the total use of raw material in the processing industry measured in monetary terms. The species are in general rather well known but to some extent the raw material is substituted from time to time pending the comparative prices. The species calculated as round weight are not possible to calculate.
- **Income (turnover), total and per product:** The total turnover, also divided per NUTS 3 and 5 areas and into company size categories (number of employment), is available. Turnover per product is not available but consumer price index for the most important consumer items are available.
- **Production costs, total and per category cost:** All figures are available except packaging and the costs for obtaining that figure do not correspond to the benefits. Also it seems that the packaging costs between the different processing companies vary substantially.
- : The booked values are available.
- **Investment (asset), historical, replacement and insurance.** The value of the bookkeeping is available which is the historical value minus the depreciation. This value should be very close to the insurance value but no exact parallel exists. The historical and replacement values are not available.

- **Prices/product, value, tonne.** The companies are very reluctant to give away any figures but in spite of that some figures are available but they are not reliable. In practical terms no reliable figures are available. The consumer price index for fishery products and for individual items is available.
- **Employment, numbers/FTE.** The employment is available as the medium number of employed. The FTE is not available. As the number of staff working part time is rather limited the figures presented are rather close to FTE.
- **Capacity utilisation.** Not available. A query to the industry gave unreliable results.

### **Extended programme**

Data on income, labour, energy, raw material (value), other running costs, investment, employment, value added will be presented at NUTS 3 and NUTS 5 levels in accordance to Commission Regulation No 1639/2001 Annex Chapter IV K.2. (b). Data for regions with very low number of companies, however, cannot be presented separately.

Data at national level for different size groups of companies (employment) will also be presented. Companies will be divided into the following groups (based on employment):  
0, 1-4, 5-9, 10-19, 20-49 and 50 people or more. No employed people means self-employed.

It will not be possible to present data for the parameters according to Commission Regulation No 1639/2001 Annex Chapter IV K.2. (a). Further work at community level should be undertaken to identify the most relevant parameters before regular data collection is made in this field. In Sweden about 80% of the raw material, counted in monetary terms are imported from outside the EU. The trade conditions including the trade agreements, autonomous tariff quotas and the CN code, which also are parts of the CFP are more important than the conservation regulations. However for cod and herring these regulations are important. The connection between the regulations affecting the catching sector and the processing sector can only be made in qualitative not quantitative terms.

### **5. Financial contribution by the Commission to the costs of the data collection programme**

In accordance with Article 6 of Council Regulation (EC) No. 1543/2000, every Member State is entitled to receive a financial contribution from the Communities for the implementation of its national data collection programme. Details of these financial contributions are regulated in Council Decision 2000/439/EC.

The costs for 2005 are reported in detail broken down by the minimum and extended programme and grand total. Operating cost per day for research vessel ARGOS is calculated. Total costs for a survey include weekends. This means that a survey of 15 days at sea has costs for 20 days for ARGOS.

## 6. Co-ordination

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Since 2004, one national co-ordination meeting will be held each year with participants from all institutes/departments involved in the Swedish Data Collection Programme. The purpose is to synchronise the application procedure and the Technical Operational Report.

In 2005, our staff will continue to be active in the international forum, working on improving age-reading, methods for calculating precision and design of surveys.

Participation in the Regional Planning Groups that are about to be established is also a priority. A Group for the Baltic area had its first meeting already in April 2004. Also a meeting on data collection for *Nephrops* was conducted in early April 2004. Work on update of data on sexual maturity and growth was suggested to start in 2004. Sweden plans to take part in the workplan set up for 2004 onwards. This means some effort in collecting data on other biological parameters for *Nephrops*.

Co-ordination of our data-bases is intensified in 2004 but additional efforts are needed in 2005 in order to have all participating laboratories integrated.

## 7. References

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ICES 2000. Manual for the International Bottom trawl Surveys. ICES CM 2000/D:07

**Comment [ek1]:** Navnet på manualen bør angives

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**Comment [ek2]:** Navnet på manualen bør angives

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Anon. 2000b. Monitoring discarding and retention on fishing vessels towing demersal gears in the North Sea and Skagerrak. First Annual Progress Report. EC Project: 98/097

1999. Herring surveys in the North Sea and west of Scotland (HERSUR II) EU Proj. No. 99/06

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2000. Economy of the coastal fisheries population. National Board of Fisheries Report 2000:1

**List of acronyms:**

ACFM	Advisory Committee on Fishery Management
BITS	Baltic International Trawl Survey
HAWG	Herring Assessment Working Group for the Area South of 62° N
IBTS	International Bottom Trawl Survey
PGCCDBS Sampling	Planning Group on Commercial Catch, Discards and Biological
WGBIFS	Baltic International Fish Survey Working Group
WGBFAS	Baltic Fisheries Assessment Working Group
WGBFAST	Baltic Salmon and Trout Assessment Working Group
WGNEPH	Working Group on <i>Nephrops</i> Stocks
WGSSK	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak
WGPAND	<i>Pandalus</i> Assessment Working Group

**Deleted:** PGSPFN Planning Group on Surveys on Pelagic Fish in the Norwegian Sea. ¶

**8. Appendixes I-IX**

**Appendix I. Swedish discard sampling effort by species and area**

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Species	Area	Landings in 2001-2003 (tonnes) Ave	Beforehand estimates		Yearly discard sampling required (Y/N)	Sampling frequency rules <sup>1)</sup>			Estimated Sampling frequency		
			Discard rates (weight)	Discard rates (numbers)		Number of samples	Number of individuals measured pr. sample	Number of fish aged pr. sample	Minimum No samples	Minimum Number of individuals measured	Minimum Number of fish aged
Cod	IIIb-d	16 781	>10%	>20%	Y	1/200	50	25	84	4200	2100
Cod	IIIa S	942	>10%	>20%	Y	1/100	50	50	5	250	250
Cod	IIIa N	857	>10%	>20%	Y	1/100	50	25	4	200	100
Haddock	IIIa N	317	>10%	>20%	Y	1/100	50	50	2	100	100
Hake	IIIa N	34	<10%	<20%	N	1/100	50	50			
Herring	IIIa	35 677	<10%	<20%	N	1/1000	100	100			
Norway lobster	IIIa	981	>10%	>20%	Y	1/100	200		5	1000	
Plaice	IIIb-d	107	<10%	<20%	N	1/100	50	50			
Plaice	IIIa S	237	>10%	>20%	Y	1/100	50	50	1	50	50
Plaice	IIIa N	132	>10%	>20%	Y	1/100	50	50	1	50	50
Saithe	IIIa N	1 454	<10%	<20%	N	1/100	50	50			
Sole	IIIa	17	<10%	<20%	N	1/50	100	100			
All stocks	IV, VIId				N						

1) As specified in Commission Regulation (EC) No 1639/2001.

## Appendix II. Swedish sampling efforts by species and area based on landings made in Swedish fishing ports. Minimum Program

Appendix II. Swedish sampling effort by species and area based on landings made in Swedish ports. Minimum Programme.

Species	Area	Total EU TAC 1)	Swedish TAC 1)	Swedish TAC in %	Sw landings in 2001-2003 (tonnes) ave.	SW landings in 2003	Other member states landings in SW 2003 (tonnes)	Sampling required (Y/N)	Sampling frequency rules 2)			Estimated sampling 2005		
									Number of samples per fished tonnes	Number of fish measured per sample	Number of fish aged per sample	Minimum number of samples	Minimum number of individuals measured	Minimum number of fish aged
Blue whiting	IIIa N	42 550		<5	81	130		N	1/1000	50	50			
Cod	IIIb-d	58 864	19 530	33	16 781	14 545	631	Y	1/200	50	25	250	6000	6000
Cod	IIIa S	5 333	1 976	37	942	848		Y	1/100	50	50	9	450	450
Cod	IIIa N	8 287	1 197	14	857	587	17	Y	1/100	50	25	6	300	150
Haddock	IIIa	3 120	308	10	317	231	6	Y	1/100	50	50	3	150	
Hake	IIIa	944	75	8	34	37	0	N	1/100	50	50			
Herring	IIIbcd	160 933	71 198	44	52 517	39 358	503	Y	1/1000	100	100	40	4000	4000
Herring	IIIa	76 277	34 919	46	35 677	34 369	1	Y	1/1000	100	100	35	3500	3500
Mackerel	IIIa	25 282	5 034	20	4 847	4367*	8	N	1/500	100	100			
Norway Lobster	IIIa	4 667	1 228	26	981	893	17	Y	1/100	200		EP	EP	EP
Norway Pout	IIIa	184 067		<5				N		50	50			
Pandalid shrimps	IIIa	5 233	1 832	35	1 961	2 035	248	Y	1/100	400		21	8400	
Plaice	IIIb-d	3 200	200	6,25	107	142		N	1/100	50	50			
Plaice	IIIa S	2 250	227	10	237	248		Y	1/100	50	50	3	150	150
Plaice	IIIa N	8 821	376	4	132	142	1	Y	1/100	50	50	2	100	100
Saithe	IIIa N	50 157	1 620	3	1454	936	15	N	1/100	50	50			
Salmon	IIIb-d	339 377	123 652	36	94 874	83 031	42	Y	1/100	50	50	6	300	300
Sandeel	IIIa N	952 667		<5	36 361	22 476		N	1/1000	50	50			
Sea Trout	IIIb-d						3	N		50	50			
Sole	IIIa	716	24	3	17	11		N	1/50	100	100			
Sprat	IIIb-d	149 590	77 206	52	74 412	73 638	3 361	Y	1/2000	100	50	37	3700	1850
Sprat	IIIa	46 250	12 680	27	6 988	8 399		Y	1/1000	100	50	9	900	450
All stocks	IV,V,VI,d			<5				N						

1) Average during years 2001-2003

2) As specified in Commission Regulation (EC) 1639/2001

\*) 94% landed outside Sweden

## Appendix III. Swedish sampling effort by species and area based on landings made in Swedish fishing ports. Extended Programme.

Species	Area	Total EU TAC <sup>1)</sup>	Swedish TAC <sup>1)</sup>	Swedish TAC in % <sup>1)</sup>	SW landings in SW in 2001-2003 (tonnes) Ave.	SW landings in SW in 2003 (tonnes)	Other Member states landings in SW 2003 (tonnes)	Sampling required (Y/N)	Sampling frequency rules 2)			Estimated Sampling 2005		
									No of samples per fished tonnes	Number of fish measured per sample	Number of fish aged per sample	Minimum number of samples	Minimum number of individuals measured	Minimum number of fish aged
Eel	IIIb-d				287	269		Y	1/100	50	50	17	850	850
Eel	IIIa				212	218		Y	1/100	50	50	11	550	550
European whitefish	III,d				259 <sup>1)</sup>	278		Y	1/100	50	50	46	2 300	2 300
Flounder	IIIb-d				335	273	7	Y	1/200	50	50	26	1 300	1 300
Flounder	IIIa				28			Y	1/200	50	50	2	100	100
Norway lobster	IIIa S	4 667	1 228	26	981	291	21	Y	1/50	200		6	1 200	
Norway lobster	IIIa N					593		Y	1/50	200	12	2 400		
Perch	III,d				101 <sup>1)</sup>	108		Y	1/100	50	50	24	1 200	1 200
Pike	III,d				58 <sup>1)</sup>	40		Y	1/100	50	50	15	750	750
Pike-perch	III,d				31 <sup>1)</sup>	35		Y	1/100	50	50	6	300	300
Turbot	IIIb-d				95	37		Y	1/100	50	50	12	2 800	500

1) Average during years 2000-2002

2) As specified in Commission Regulation (EC) No 1639/2001.

#### Appendix IV. Sampling of European whitefish 2005.

Gear type	Quarter	ICES Sub-Division				Total
		27	29	30	31	
Gill-net	1	0	0	0	0	0
25-35 mm	2	0	0	1	0	1
bar length	3	0	1	0	0	1
	4	0	0	0	1	1
	<b>Total</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>3</b>
Gill-net	1	0	0	0	0	0
36-45 mm	2	0	1	5	1	7
bar length	3	0	0	3	3	6
	4	0	0	1	1	2
	<b>Total</b>	<b>0</b>	<b>1</b>	<b>9</b>	<b>5</b>	<b>15</b>
Gill-net	1	0	0	0	0	0
46-65 mm	2	1	1	1	0	3
	3	1	1	1	0	3
	4	1	1	0	0	2
	<b>Total</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>8</b>
Trap net	1	0	0	0	0	0
	2	0	0	4	4	8
	3	0	0	3	9	12
	4	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>13</b>	<b>20</b>
	<b>Grand Total</b>	<b>3</b>	<b>5</b>	<b>19</b>	<b>19</b>	<b>46</b>

#### Appendix V. Sampling of Pikeperch 2005.

Gear type	Quarter	ICES Sub-Division		Total
		27	29 N	
Gill-net	1	0	0	0
> 45 mm	2	1	1	2
bar length	3	1	1	2
	4	1	1	2
	<b>Total</b>	<b>3</b>	<b>3</b>	<b>6</b>

#### Appendix VI. Sampling of Perch 2005.

Gear type	Quarter	ICES Sub-Division			Total	
		27	29 N	30		31
Gill-net	1	0	0	0	0	
>38 mm	2	1	1	1	1	4
bar length	3	1	1	4	1	7
	4	1	1	0	0	2
	<b>Total</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>2</b>	<b>13</b>
Trap net	1	0	0	0	0	0
	2	0	0	1	3	4
	3	0	0	1	5	6
	4	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>8</b>	<b>10</b>
Pound net	1	0	0	0	0	0
	2	0	0	0	0	0
	3	1	0	0	0	1
	4	0	0	0	0	0
	<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>
	<b>Grand Total</b>	<b>4</b>	<b>3</b>	<b>7</b>	<b>10</b>	<b>24</b>

**Appendix VII. Sampling of Pike 2005.**

Gear type	Quarter	ICES Sub-Division					Total
		25	27	29N	30	31	
Gill-net	1	1	0	0	0	0	1
	2	1	1	1	0	1	4
	3	0	0	0	1	1	2
	4	0	1	1	0	1	3
	<b>Total</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>10</b>
Trap net	1	0	0	0	0	0	0
	2	0	1	2	0	1	4
	3	0	0	0	0	1	1
	4	0	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>5</b>
<b>Grand Total</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>5</b>	<b>15</b>	

**Appendix VIII. Sampling of Flounder 2005.**

Gear type	Quarter	ICES Sub-Division						Total
		21	23	24	25	27	28	
Gill-net	1	0	1	2	1	0	0	4
	2	0	0	0	0	4	0	4
	3	0	0	0	0	6	3	9
	4	0	1	0	1	0	0	2
	<b>Total</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>10</b>	<b>3</b>	<b>19</b>
Demersal trawl	1	2	0	0	5	0	0	7
	2	0	0	0	0	0	0	0
	3	0	0	0	0	0	1	1
	4	0	0	0	1	0	0	1
	<b>Total</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>9</b>
<b>Grand Total</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>8</b>	<b>10</b>	<b>4</b>	<b>28</b>	

**Appendix IX. Sampling of eel 2005.**

Gear type	Quarter	ICES Sub-Division				Total
		20	21	23	27	
Eel pots	1	0	0	0	0	0
	2	1	0	0	0	1
	3	2	0	0	0	2
	4	0	0	0	0	0
	<b>Total</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>
Fyke net	1	0	0	0	0	0
	2	2	2	2	4	10
	3	2	2	2	4	10
	4	0	0	0	0	0
	<b>Total</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>8</b>	<b>20</b>
<b>Grand Total</b>	<b>7</b>	<b>4</b>	<b>4</b>	<b>8</b>	<b>23</b>	

### 3.4.5. Salmon river survey

Baltic salmon has been sampled as indicated by the minimum programme in Commission Regulation (EC) No. 1639/2001, prescribing market sampling of catches as the only monitoring of the stocks. SGRN noted as a general comment that the absence of river surveys made the MP inadequate to assess if the agreed management objectives are achieved (SEC 200, Brussels 9-13 December 2002). Therefore, in 2004, the Swedish NP will include river surveys and they will run with an even sampling intensity in 2004-06. The survey programme will be decreased if the proposed surveys are not included in the MP after revision of Regulation 1639/2001.

There are 14 Baltic wild salmon rivers in Sweden and 2 nationally appointed creel rivers where salmon is re-introduced in accordance with the agreed management plan. The status of the stocks in these rivers will be monitored by surveys which include three elements: counts of spawners, surveys of juveniles by electrofishing and smolt trapping.

Counting of spawners takes place in fish ladders for ascending fish. Fish ladders exist in several Swedish salmon rivers and fish counts from these ladders are collected manually or by automatic counters. The data from fish ladders are of variable quality, which makes them difficult to use. The survey programme will consist of collecting high quality data from counting systems in at least four rivers over the entire season when salmon enter the rivers. Data are collected on numbers of ascending fish, their size distribution and in the case of manual counting, information is also collected on species, sex and age.

Electrofishing surveys of juvenile densities will take place in 16 rivers. The surveys will be carried out in accordance with the established Swedish electrofishing standard procedure. On about 20% of all occasions, surveys can not be carried out due to flooding of the rivers.

The smolt production is the ultimate measure of success of the management plan. Smolt traps will be used to monitor the number of emigrating fish in spring. Equipment will be bought in 2004 and traps will be deployed in 2004-06. Smolt production will be monitored in at least one important salmon river each year.

All surveys are in line with ICES advice and planning is carried out in cooperation with Finnish scientists to improve co-ordination with the Finnish NP programme as suggested by SGRN (SEC 200, Brussels 9-13 December 2002).

Survey data are stored in fish databases administered by the Institute of Freshwater Research. All data from electrofishing surveys are collected in a national database, SERS (Swedish Electrofishing RegiSter), at the Institute of Freshwater Research. Aggregated data are reported annually to the ICES Working Group (WGBAST).

### 3.4.4 Atlanto/Scandinavian Herring Survey

The EU-survey is conducted during the 2<sup>nd</sup> quarter (30 days at sea, 15 trawl stations, 35 CTD stations) with either the research vessel Tridens or Walter Herwig. The survey covers area IIa.

The EU-survey is done in collaboration with Denmark, Germany and Netherlands.

The surveys are ICES co-ordinated and since 1998, a series of 8-10 surveys are carried out every year by Faroese, Icelandic, Norwegian, Russian, and EU-research vessels in spring and summer in Norwegian and Barents Sea.

The main objectives of the co-ordinated surveys are to map the distribution and migration of the herring and other pelagic fish, and to monitor environmental conditions of the Norwegian Sea. The main purpose of the May survey, in which the EU-survey vessel is one part out of four research vessels, is to provide acoustic abundance estimates of herring in the Norwegian Sea every year.

The sampling procedure and levels of precision are discussed yearly in ICES Planning Group on Surveys on Pelagic Fish in the Norwegian Sea.

During the surveys, continuous acoustic recordings of fish and plankton are collected using calibrated echo integration systems (38 kHz Simrad EK500 working at a range of 10 - 500 m). The recordings of area back scattering strength ( $S_A$ ) per nautical mile were averaged over five nautical miles, and the allocation of area back-scattering strengths to species was made by comparison of the appearance of the echo recordings to trawl catches.

The length, weight, sex, maturity stage and stomach contents are recorded. Scales are taken for age reading.

Primary survey data are stored in a survey database administered by IMR in Bergen, Norway. Aggregated data are reported and used annually by relevant ICES Working Groups.