Proposal including detailed description of the budget for 2003.

Danish National Programme for collection of fisheries data

by

Danish Directorate of Fisheries
Danish Institute for Fisheries Research
Danish Research Institute of Food Economics

Copenhagen 30. May 2002

Table of contents:

Danish National Programme for collection of fisheries data.

1. Introduction.

This document describes the Danish Programme for collection of data in the fisheries sector. The programme has been developed in accordance with the rules laid down in the *"Commission Regulation (EC) N^0 1639/2001 of establishing the Minimum and Extended Community Programmes for the collection of data in the fisheries sector and laying down detailed rules for the application of Council Regulation (EC) N^0 1543/2000"*, hereafter in this programme called the "Data Directive".

The programme will be conducted in close cooperation between:

- **Danish Institute for Fisheries Research**
  Danish Institute for Fisheries Research (DIFRES) is a Public Research Institution which carries out research, investigations and provides advice concerning sustainable exploitation of live marine and fresh water resources. Moreover, processing and improvement of fish products as well as quality assurance in the fish industry are important parts of the research areas of the institution.
- **Danish Directorate of Fisheries**
  Danish Directorate of Fisheries (FD) performs control and authority exercises at the commercial fisheries and the recreational and game fisheries.
- **Danish Research Institute of Food Economics**
  The Danish Research Institute of Food Economics (FOI) is a Public Research Institute. The researchers and academic staff of the Institute have backgrounds and experience in economics, agricultural and resource economics, agronomy, as well as a wide range of statistical methods and applied research tools.

The Danish Institute for Fisheries Research is acting as coordinator for the Danish Programme. A Steering Group has been established with members from all three Institutes involved in the programme. The main objective of the Steering Group is to coordinate of the work under the programme.

Primary data collected under the Danish programme will be stored in the following computerised databases:

- Vessel register. Data on fishing capacity. (FD)
- Logbook database. Data on origin of catches and on effort. (FD)
- Sales notes database. Data on quantities landed and prices. (FD)

- Species composition database. Data on species composition in landings for industrial purposes. (FD)
- Biological database. Data on discards and biological parameters. (DIFRES)
- Economic data. (FOI)

In addition to the above-mentioned databases containing primary data a database, the Danish Fisheries Analyses Database (DFAD) containing information from all databases merged and aggregated by segments is established. This database contains most of the information requested in research projects and in relation to fisheries management.

Economic data will be collected by FOI and stored in a database managed by the institute. These data are surrounded by strict confidentiality and will not in any circumstance be passed on to other persons or authorities. Each year FOI produces an analytic file on the individual level, which includes relevant data for stratification and grouping for statistical purposes. Based on the analytic file a number of statistical files will be produced and made available for external users.

All data collected under the programme are dealt with in confidence. Accesses to the data are limited to authorised staff member from the three institutes and no one outside the institutes has access to the data without permission.

1.1 Co-operation and task sharing between Denmark and other Member States

Collection of information on fishing capacity, fishing effort, economic and landings statistics are carried out entirely on a national basis. Biological information on catches, information collected by research vessels and information on discards are in most cases coordinated internationally and carried out in close cooperation with research institutes in Member States and third countries.

In the economic field FOI constitutes the Danish representative in the project economic Assessment of European Fisheries organized under the Concerted Actions and Thematic Networks which is committed to develop a common method or standard for evaluation of the economic situation in the Community fisheries.

1.2 National Correspondent

Denmark has assigned the Danish Institute for Fisheries Research as the National Correspondent. Contact person is until further notice Fishery Adviser Jørgen Dalskov

1.3 Appreciation of the level of precision

The information on landings by species, catch areas, fishing effort and fishing capacity will be given on the highest possible level of precision.
Information concerning landing figures (tonnes by species) will be given as census data, which 100% coverage as all landings or all fish sold in Denmark is reported to FD.

For the biological and economical information level of precision can not be estimated at this stage. At DIFRES developing of methods to calculate the precision is initiated. This method will be tested when data from the first half years data collection is finalised. Results from these test will be taken into account when implementing the 2003 sampling scheme.

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

2.1 C. Collection of data concerning fishing capacity

Minimum programme:

All Danish fishing vessels with the right to undertake commercial fishery are registered in the Vessel Register of the FD. The Vessels Register is a computerised database and includes among others the following information:

- Vessel type e.g. trawler, seiner
- Vessels age (age of the hull)
- Dimensions of the vessel; GRT, length, width, draught.
- Engine power, type and age.
- Insurance value and –year.

The information in the Vessels Register is registered according to Regulation (EC) N^{o} 2930/86 and N^{o} 2090/98.

The Vessel Register is updated daily.

The information on fishing capacity is merged with other fishery dependent data and stored in the DFAD as described in Section 5.

Data on fishing capacity on an aggregated level by segments as described in Appendix III of the Data Directive can at any time be delivered on a precision level of 3 as all fishing vessels is registered. As there is no lower limit on the size of the fishing vessel for registration in the Vessel Register and all vessels are registered a 100% coverage of all Danish fishing vessels will be given.

Extended Programme:

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

2.2 D. Collection of data related to fishing effort

Minimum programme:

The base for the regulation concerning the collection of information on the catch origin is the EC-regulations on logbooks, etc. and the implementation of a control-regulation concerning the common fisheries policy and more explicit regulations of information on catches by Member States.

The set of regulations prescribes that all vessels used for commercial fishery are obliged to keep logbooks of the fishery. The only exception from these rules is vessels with a total length less than 10 m. For these vessels (less than 10 m.) a catch area declaration. A catch area declaration is made for vessels which limit its fishing activities to a single defined area (ICES Sub-division).

All the information is stored in the Logbook database which is a computerised database of the Danish Directorate of Fisheries and includes among others the following information:

- Vessel name, number and captain
- Departure and arrival date and time
- Gear type employed
- Fishing ground, area and square
- Registration of fishing days
- Estimated catch per species once a day at the minimum.

The information in Logbook database is registered according to the provisions of Commission Regulation (EC) No 2807/83 and No 2847/93.

It is possible to estimate the fishing effort, defined as fishing days, for vessels less than 10 m (loa) as sales slips also for these vessels are recorded. Therefore, if a sales slips are recorded for a vessels less than 10 m (loa) a fishing day can be recorded.

The information on fishing effort is merged with other fishery dependent data and stored in the DFAD as described in Section 5.

Data on fishing effort on an aggregated level by segments as described in Appendix V, Appendix VI and Appendix VIII of the Data Directive can at any time be delivered on a precision level of 2 respectively level 1 for passive gears.

Information on fuel consumption will be collected within the data collection programme according to Chapter IV in the Data Directive.

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

Minimum programme:

According to the legislation information on sold fish and shellfish has to be reported to the Danish Directorate of Fisheries (FD).
The registration and information duty applies to the following persons and parties:

- Storage warehouses, cold storage warehouses, or other establishments receiving fish and shellfish with purpose for sale, storage, sorting, or other liking treatments before the fish is sold to first hand buyers.
- Persons or parties that as a part of their trade buy fish directly from the fishermen for sale purposes on the home-market, export including transistation, for conservation purposes or processing for later sale.
- Persons or parties receiving fish directly from the fishermen in cases where the sale has taken place before the landing of the fish.
- Fishermen selling the catch directly to the consumer, or who lands directly in a foreign country, or export including transistation, or process the fish from own landing.

Therefore, all information on sold fish and shellfish are registered and all these information are stored in the Sales Notes database which is a computerised database and includes among others the following information:

- Vessel number.
- Landing place and buyer.
- Species and size-class.
- Quality and purpose (e.g. human consumption).
- Weight in kilo and value in national currency (exchanged to DKK)

The information in the Sales Notes database is registered according to the provisions of Council Regulation (EC) No 2847/93 and No 104/2000.

It should be mentioned that all landings are recorded and there is no derogation for vessels less than 10 m (loa). This means a 100% coverage for all landings.

The Danish fishery can be divided into two categories: A fishery with landings only for human consumption purposes and the so-called “Industrial fishery”, where all the landings are made for reduction purposes (fish meal and oil).

3.1.1 Collecting data on landings designated human consumption.

The above mentioned information in the Sales Notes database provides the background for collecting information of landings made for human consumption landed by Danish fishing vessels.

3.1.2 Collecting data on landings designated reduction purposes.

For landings made for reduction purposes only the target-species is registered. As by-catches occurs in the industrial fisheries the Sales Notes database does not contain reliable information on landings by species in these fisheries and additional information has to be collected to provide estimates of landings by species. The method and data used in estimation of landings by species is described in the following.

Sampling scheme for the industrial landings

The objectives of the Danish sampling scheme for industrial landings are:

- To collect data needed for estimation of the species composition of landings by statistical rectangle and month.

- To collect biological information on e.g. age and racial composition by species, month and area.

A number of random sub-samples are taken from the landings. The samples are sorted and weighted by species. The information registered includes e.g.:

- The vessel number.
- Landing harbour and landing date.
- Total landing in kilos.
- Total weight in grams per sample.
- Weight in grams per species.

The samples are collected and processed by FD and data are stored in the Species distribution database which is a computerised database in FD.

In addition to the above-mentioned samples, FD collects a number of samples, which are delivered to DIFRES. These samples are sorted by species and each species is length measured, weighed and selected species are aged.

The species composition of the landings is derived as follows:

The total landings for reduction purposes by month and area are calculated using the sales note database. The landings are then allocated to statistical rectangle using the relative geographical distribution from the logbook database of landings identified as have been taken for reduction purposes. The output is the total industrial landings by statistical rectangle and month.

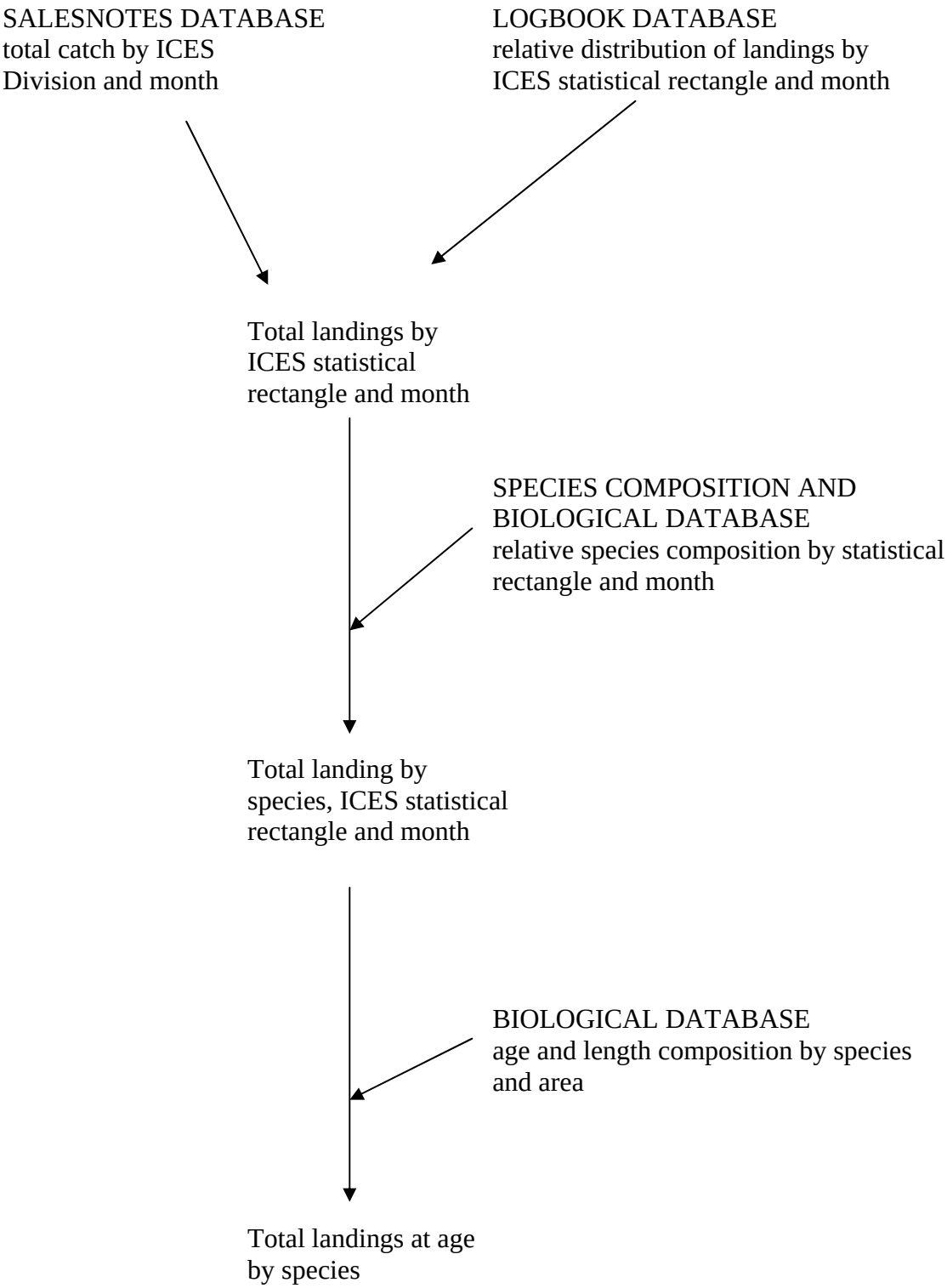
The relative species composition by statistical rectangle and month is estimated using the information in the species composition and biological databases. An average composition by rectangle is estimated as the mean of all samples from the rectangle. If more than one sample is taken from the same landing, a mean composition of the landing is calculated and treated as one sample.

After calculation of average composition by rectangle a new average composition is calculated taking into account the species composition in all neighbouring rectangles. Taking the mean species composition of the rectangle and all 8 surrounding rectangles does this.

The total landings by species, statistical rectangle and month are calculated using the estimated species composition and total landings by rectangle and month.

The estimation procedure is illustrated by the flow diagram below.

Information contained in the biological database is used to estimate the total catch in numbers at age as well as other information needed as input in the assessment of the stocks.



The information on landings is merged with other fishery dependent data and store in the DFAD as described in Section 5.

Data on landings for the stocks mentioned in Appendix XII of the Data Directive will be given disaggregated as indicated in that Appendix.

Discards will be monitored for the stocks mentioned in Appendix XII of the Data Directive and by type of technique as defined in Appendix III of the Data Directive except for the stocks for which Appendix XII specifies another disaggregation rule. The information on discards will collected according to the programme described in Section H.

Information on human consumption landings will be given on a precision level 3. As human consumption species landings include all landings (census data) the precision will be better than required.

The precision of landings of target (and TAC) species in the fisheries for reduction purposes will at least be at level 2 (Lewy 1996, Lewy 1995).

As some of the species listed in Appendix XII of the Data Directive occur as by-catch in landings made for reduction purposes in scarce quantities it is not possible to decrease the error without having disproportionately high resource expenses (Lewy 1996, Lewy 1995). Thus it will not be possible when estimating the by-catch quantities per species to reach a precision level higher than 1.

The programme for collecting data related to annual estimates of discards for the stocks mentioned in Appendix XII of the Data Directive will be set up in order to achieve a precision level of 1 for the estimation of the amount of discards for the specific species.

3.1.3 Collecting data on recreational fishery for salmon in the Baltic

The recreational fishery for salmon in the Danish waters, are very much concentrated to a coastal trolling fishery at the northeast coast of Bornholm in Sub-division 25.

The fishing season starts in the beginning of March, and ends in the middle of May, and boat hires are arranged 4 places at the coast of Bornholm only for Salmon trolling fishery.

As the catches in the recreational fishery in Denmark are not officially registered, we have had to interview the 4 firms at Bornholm whom are living from hiring out boats for this very special Salmon-trolling fishery.

From these 4 interviews, and from talks with 2 Danish sport fisher magazines, we have made the estimation/guesstimation that the yearly total catch of recreational caught salmon is 3000 individuals. From our own knowledge, and from our very near contact to the fishery at Bornholm, this figure is believed to be rather close to reality.

As the catch level for recreational caught Salmons in Denmark, has been at the same level for some years, we expect that the figure for year 2003 also will be 3000 individuals. If any new information is available in 2003 these will be taken into account.

3.2 Danish discard sampling

3.2 1 Introduction

According to the Data Directive chapter 3.E.1.b Denmark must collect discard data in order to be able to present estimates of discard rates for selected species. Collection of such data has been going on in Denmark already for some years as systematic catch sampling directed towards the estimation of discard rates was initiated in 1995 both in the North Sea, Skagerrak, Kattegat and the Baltic Sea. The sampling has been ongoing since then with 50% financial contribution from EU. Before 1995 only sporadic discard sampling has been carried out.

3.2.2 Danish sampling effort of relevant species and areas

Appendix II gives an overview of the species and areas for which discard estimates is to be made according to Article H section e). Furthermore Appendix II gives the number of samples to be taken according to Data Directive Annex XV.

The discard sampling schemes will under the observance of the yearly sampling level given in appendix II be organized in a way that sampling efforts are distributed according to the fishing intensities in the different strata –a relative large number of landings imply heavy sampling effort and relative smaller number of landings implies less sampling effort. This assures that the biological data are directly applicable to the national landing statistics.

All Danish discard sampling follows the rules laid down in national (North sea and Skagerrak) or international agreed sampling manuals (Kattegat and the Baltic Sea). In these documents most relevant aspects of “at sea sampling” is covered (including: selection procedures for selecting fishing trips, description of sub-sampling procedures, recording of data, etc).

Within the overall framework given in appendix II, the sampling will be stratified on:

- ICES Division/Sub-division.
- Quarter.
- Discard pattern relevant defined fisheries.

The fisheries will be defined on gear type, mesh size and target species and reflect the discrete discard patterns in the Danish fishery. The landing distribution by fishery of commercial important species in 2001 is given in the table below. The number of samples planed in 2003 will be dimensioned according to discard information collected in 2001 but will be subject to running adjustments during 2003 according to the fishery actually realised.

In many cases the observer on board will have the possibility in the spare time between hauls to obtain length distributions for species not defined as mandatory according to Article H section e).

The sampling of commercial vessels will normally be done on board during normal active fishery by observers trained and employed at DIFRES. Only in fisheries where it is verified that no advantages are obtained by sampling on board (e.g. fisheries where no discards are made), in fisheries where the vessels are to small to carry an extra person or where sampling on board for various reasons are impossible to

organize will discard sampling be made in harbours during landing. In such cases and when the observers are confident with the skipper and crew, the part of the catch, which normally will be discarded, will be landed separately from the normal landing part of the catch and worked up and recorded. In this case the same information are collected and recorded as if the observer has been on board.

The vessels for monitoring will more or less be randomly selected within a given fishery among a large number of vessels identified in close cooperation with the Danish Fishermen's Organisation. In addition some considerations will be made in order to assure that different vessel sizes and various duration of the fishing trips are covered. There is no authority in Danish law, which give the possibility to enforce the observers' participation on a fishing trip. Therefore, the vessels will not be sampled randomly among all vessels performing a given fishery but only among the vessels where the skipper beforehand has agreed in having observers on board. It is the objective to include as many different vessels as possible in the sampling scheme. By the involvement of the Danish Fishermen's Organisation in the selection of vessels potential for sampling, some mutual concessions are facilitated allowing the broadest possible basis for the sampling, representing most categories of behaviour among fishermen and assuring not too biased results.

The fishery performed in different areas differs considerably in respect to duration, number of station per trip and handling of the catch. In the North Sea trips are often up to 3 weeks of duration, while trips of 1-2 days duration are common in Kattegat and the Baltic Sea. Because of differences in the fisheries in the areas different sampling procedures are applied. If possible and advantageous all biological information from the catch will be sampled from each station.
Those are:

- 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 catch is landing in commercial weight categories separate length frequencies are obtained.
- Otoliths and individual mean weight per cm-length group of selected species.

In addition all relevant vessel, gear and geographical information will be recorded.

If such an extensive sampling is not possible due to long trips, inadequate time between stations to work up the whole catch, only the discard part of the catch will be fully worked up (species distribution, length distribution and otoliths). In these areas traditional harbour sampling will be carried out regularly.

All data recorded in connection with the collection of discard are included in a national central database (see Section 1) holding all biological catch data collected by DIFRES.

Danish discard figures will be raised to total yearly discard by species and fishery by applying the ratio between discard and retained amount in the sampled fishing trips to the total landing. Data will be published.

3.2.3 Quality assurance

The discard data are collected in agreement and in cooperation with the Danish Fishermen's organisation. This assures a continuous and fruitful communication between the industry and the fisheries biologists and facilitates the possibility of a continuous adjustment of the sampling scheme to the actual activity and trends in the industry. At the same time a careful going through the data collected looking at the premises for the sampling, not the results, assure that the data collected are in agreement with the reality defined as the understanding of the fishery based on discussions between in the fishermen and the biologists.

A very important spin-off from the discard sampling at sea is the opportunity to intensify the communication with the Danish Fishermen's organisations and the individual fisherman providing a natural possibility to explain and overcome the misunderstandings often exciting between the fishermen and the fisheries biologists. This has already involved changes toward a more constructive and responsible attitude by the fishermen and the Fishermen's Organisation.

3.2.4 International discard data storage

All Danish catch data sampled during discard sampling in Kattegat and the Baltic Sea are included in the international common IBSSP database: BALTCOM. This database constitute the backbone in all 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.

It is the ambition that the database in the future besides providing age aggregated discard information, in addition shall provide the basis for central calculation of age-aggregated landings in numbers for all countries fishing in the Baltic Sea (per e.g. 1000 tons landed). The initial step is already taken by including data from harbour sampling in the database and the development of software. This will assure that the input to the assessment model used by the Baltic Fish Assessment Working Group will be calculated in a consistent and well-documented way.

From mid year 2002 an updated web-based version of the database will be introduced allowing participating countries to access all data through an Internet browser.

3.2.5 Appreciation of the level of precision

Only few initiatives have been made to meet the growing international demand for exact information of the precision level connected to various catch statistics. The EMAS project (CFP Study Project 98/075) applies bootstrapping techniques to

estimate the uncertainties on marked sampling. Others (Lewy 1996, Lewy 1995) calculate uncertainties by assuming underlying distributions to the data. It is the ambition for DIFRES to use the experience obtained in the EMAS project to develop bootstrapping procedures, which as standard shall provide estimate of precision of all central biological parameters and catch statistics. The aim is to include those procedures in the standard quality assurance programs currently under development for all standard sampling and working up procedures at DIFRES.

Extended Programme:

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

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

Minimum programme:

The collecting of data concerning the catches per unit of effort and/or effective effort of specific commercial fleets will be done following the guidelines in the Minimum Programme, as both the catch and effort data are collected in the National Programme (Section 2.2). Even though no guidelines for the minimum programme for 2002 is specified, Denmark will continue to produce CPUE data for assessment purposes as collection of catch and effort data is carried out for all Danish fishing vessels (see Section 2.2 and 3.1).

Extended Programme:

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

3.4 G. Eligibility of the scientific evaluation surveys of stocks

The Danish Institute for Fisheries Research command three research vessels. The R/V DANA which is a stern trawler with a loa of 78 meters. DIFRES uses R/V DANA when conducting the International Bottom Trawl Survey (IBTS), the Baltic International Trawl Survey (BITS) and the Herring Acoustic Survey (HERSUR).

One of the other Danish research vessels R/V HAVFISKEN, a 20 GRT side trawler is used at the BITS survey in the Kattegat and the Western Baltic area.

The smallest of the Danish Research vessels the R/V HAVKATTEN is normally only used in the very coastal areas and is not used within any of the surveys conducted within this framework of this programme.

All member states are obligated to undertake scientific research at sea to evaluate the abundance and distribution of stock independently of the data provided by the

commercial fisheries in the case of stocks mentioned in of the Data Directive. The below described surveys are of priority 1 and are thus a part of the minimal program defined in the Data Directive Appendix XIV. Denmark will undertake 5 different surveys in the North Sea, the Skagerrak, the Kattegat and the Baltic Sea.

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

Minimum programme:

3.4.1 International Bottom Trawl Survey (IBTS)

According to the Data Directive is this survey classified as a Priority 1 survey. The survey is undertaken twice during a year, one in the first quarter (18 days at sea) and during the third quarter (18 days at sea) and is the Danish part of the IBTS. R/V DANA is used when conducting this survey.

The purpose is to estimate abundance of commercial and non-commercial fish species by means of bottom trawling and to collect otoliths of commercial species (cod, haddock, whiting, Norway pout, saithe, herring, sprat, and mackerel) to assess abundance by age, in particular for the recruiting year classes in the North Sea, the Skagerrak and the Kattegat.

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 France, Norway, England, Germany, The Netherlands, Scotland and Sweden. The survey is carried out as a bottom trawl survey deploying a GOV trawl during daylight hours as a standard aboard all research vessels involved. In addition to the trawl-surveys, a Method Isaac Kidd trawl is deployed during night hours to estimate the abundance of fish larvae, in particular herring- and sprat larvae. Hydrographical data is collected with a CTD.

Data is stored in an international database in ICES and revised before usage in the relevant ICES Working Group.

3.4.2 Baltic International Trawl Survey (BITS)

According to the Data Directive is this survey classified as a Priority 1 survey. The survey is undertaken twice during a year, in the 1st quarter (18 days at sea) and in the 4th quarter (18 days at sea) both with the research vessel R/V DANA and the smaller research vessel R/V HAVFISKEN undertakes the second part of the BITS in the sub-areas 21-23 during the same periods.

The primary purpose of the part undertaken by R/V DANA is to develop indices for recruitment and stock abundance of the Baltic cod stocks. The second part undertaken by R/V HAVFISKEN provides in addition to cod also abundance indices for flatfish.

The sampling procedure and the level of precision are defined in the Manual for the Baltic International Trawl Surveys. ICES CM 2000/H:02

R/V DANA:
The cod population is estimated by means of establishing catch-rates in bottom-trawls in different depths and areas in the ICES subdivisions 24, 25, 26, and 28.
Data on gonadal maturity and weight of individual cod and organs is obtained to establish sex specific maturity ogives, mean weight and condition at age for cod.
Hydrographical data is collected with a CTD.

R/V HAVFISKEN:
The species composition and the length distributions of all caught fish are recorded, and samples for ageing are taken of cod, plaice and sole. Hydrographical data is collected with a CTD.

Data is stored in an international database and used by relevant ICES Working Groups.

3.4.3 HERSUR (International acoustic herring survey)

According to the Data Directive is this survey classified as a Priority 1 survey. The survey is undertaken during the 2nd and 3rd quarter and consists of a calibration part (2 seadays) and an acoustic abundance estimate of herring stocks (12 seadays) in the North Sea, the Skagerrak, and the Kattegat.

The purpose is to provide acoustic abundance estimates of herring and sprat in the North Sea (eastern part), the Skagerrak, and the Kattegat.

The sampling procedure and the level of precision are defined in the Manual for the Herring Hydro Acoustic Surveys ICES CM 1994/H:3

The acoustic abundance estimate is done in collaboration between Denmark, Norway, Scotland, Germany, and The Netherlands. The herring are length measured and weighted aboard and sent to the laboratory in Charlottenlund for further examinations such as sex, maturity, age, and spawningtype.

Hydrographical data is collected using a CTD.

Data is stored in a database and revised before usage in the relevant ICES Working Group.

3.4.4 Other priority 1 surveys.

Danish research vessels have never participated in other of the priority 1 surveys listed in Appendix XIV in Data Directive and therefore derogation for participating in these surveys is requested.

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

The Data Directive gives the instructions that biological sampling must be performed in order to evaluate the composition in length and where appropriate in age of landings for all stocks specified in Appendix of the Data Directive and for some species also other biological samplings.

Biological samplings must be performed if the Danish TAC or total landings of a certain species exceeds thresholds defined in the Data Directive; Chapter H (1) (d) 1) and 2). Appendix III shows the landings made in Denmark by Danish flagged vessels and by other Member States flagged vessels. Information on the Danish and the total EC TAC is given for 2002
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 Danish harbours. The sampling will be performed by segments and the data will ultimately together with data on landings made by other nations flagged fishing vessels give the basic input data when analysing the historical exploitation of the stocks and further be the foundation when carrying out assessments on the stocks.

All biological sampling data will be stored in a central database at DIFRES. Data security is ensured by common standards. Data entry is conducted at the two laboratories in Charlottenlund and in Hirtshals to a closed network. To maintain data integrity and performance of the database a data manager will maintain the database.

The tasks of the data manager is:

- Merge data sampled on research vessel to the main base.
- Compact and tune the database at regular intervals
- Perform backup of data
- Act as help-deck for user of the base
- Maintain look-up tables
- Make error checking and consistency tests on the database
- Maintain a security system, that grant users and outside partners access to data at an appropriate level

Currently the database is implemented with the software Ingress from Computer Associates on a Unix system. The plan is to upgrade the system to a Microsoft NT

system based on SQL server. It is expected that the new DFU-database will be in use from mid of 2002.

3.5.1 The Danish standard sampling scheme

Standard samples are non-size grated samples. The standard sampling procedure will be to carry out sampling on a quarterly basis by ICES division in all the main harbours where landings takes place. Samples will be collected randomly and the number of samples will reflect the fishery activity. For each stock the intended sampling level is given for Danish landings in Denmark in Appendix IIIa and IIIc. For other EC member states landings in Denmark the sampling level is given in Appendix IIIb and IIId. The sampling level is based on the landings for 2001 and as outlined in the Data Directive for landings made by both Danish - and other Member States flagged vessels landing in Denmark.

The samples are either analysed in the harbour or send to DIFRES, where all biological measures are performed. The standard measures are:

- Length
- Weight
- Age

The ageing is performed according to the standardised method.

The aggregated data are stored in the Biological database (DFUBase) at DIFRES.

Concerning the 'Other biological sampling' outlined in the Data Directive Chapter III I. (1) the parameters in Sections (1) (a) (i) and (iii) will be sampled during surveys on all species as the samples of the commercial landings either are in such condition that histological measures are impossible or that the sampling is performed on gutted fish. However, samples of herring and sprat are subject to the parameters mentioned in Sections 1 (a) (i) and (iii) as an improvement of the estimation of spawning stock biomass and recruitment to the spawning stock is of striking importance for the assessment of these stocks.

The 'Other biological sampling' outlined in the Data Directive Chapter III I. (1) (a) (ii) will be fully completed for the relevant stocks.

With reference to Appendix IIIa-d, a description of the stocks that will be a part of the Danish sampling programme is given below. Each stock is described by the following structure: The Danish landings made in Denmark and the Danish TAC is given and the fishery for the stock is shortly described. If the biological sampling of catches deviates from the standard described above, the sampling is described. If any other biological analysis is conducted, this is described.

Minimum programme:

Introduction:

The Danish sampling scheme for 2003 is based on the Danish catches for 2001. Therefore, the total sampling for 2003 can be increased or dECreased depending on the Danish quotas for 2003 and the actual landings in 2003 both from Danish and other EC member states flagged vessels landings in Denmark.

3.5.2 The Baltic Sea. ICES Area IIIb-d

Sprat

The Danish landings in 2001 were 51,242 tonnes and the quota for 2002 is 40,104 tonnes which correspond to 24 % of the EC shared TAC. This obliges Denmark to sample this stock.

The Danish sprat fishery in ICES area IIIb-d is mainly landed for industrial purposes. The catches are mainly taken during the period from November to March.

Standard sampling procedure as described in 3.5.1 will be used.

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

Sex and maturity stage is obtained from the individuals selected for ageing in each sample. The maturity estimates after aggregation has a CV which do not exceed 5% for the interval of 20-90% of the mature fish. The sex and maturity is determined following an international key (F. E. Alekseejev & E. I. Alekseejeva 1996).

Plaice

The Danish landings in 2001 were 1,854 tonnes and the Danish TAC for 2002 is 84 % of the EC share TAC, obliging Denmark to sample this stock.

Sampling of plaice follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-4 and. At least one sample from each size-grade-class will be collected during the high season (summer).

This stock is not subject to other biological analysis.

Herring.

The Danish landings of herring in 2001 were 46,297 tonnes and the quota for 2002 is 12,337 tonnes corresponding to 11 % of the EC share TAC, obliging Denmark to sample this stock.

A major part of the herring catches (about 24,000 tonnes) in the Baltic is taken in Sub-division 24-32 (Sub-area IIId). The remaining part of the total Danish landings in 2001 is taken in Sub-division 22 (Sub-area IIIc) (about 16,000 tonnes) and in Sub-division 23 (Sub-area IIIb) (about 6,000 tonnes).The herring fishery takes place in all

seasons, however, more intensively during periods when the cod fishery is low. The catches are only landed for human consumption purposes. The fleet is mainly smaller trawlers only part-time engaged in the herring fishery. In addition a few medium sized herring-trawlers participate in the fishery.

Standard sampling procedure as described in 3.5.1. will be used.

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

Sex and maturity stage is obtained from the individuals randomly selected for ageing in each sample. The maturity estimates after aggregation has a CV, which do not exceed 5% for the interval of 20-90% of the mature fish. The sex and maturity is determined following the international 8 scale maturity key.

Cod

The Danish landings in 2001 were 25,462 tonnes and the Danish TAC for 2002 is 21,132 tonnes corresponding to 43 % of the EC share TAC, obliging Denmark to sample this stock.

The cod population in the Baltic is divided into two different stocks: The Eastern stock (Sub-divisions 25-32) and a Western stock (Sub-divisions 22-24). The sampling and data revision is made for each stock.

Also the fishery is divided into East and West of the Baltic. East of Bornholm the fishery is exclusively performed during March to August with exception of the summer-stop during June and July, and is directed towards the spawning cod population. Almost all types and sizes of vessels are engaged in the fishery and the gears used are pelagic trawl, bottom trawl, gillnet and to a lesser extent hooks. The fishery is exclusively directed towards cod and only by-catches of flounder may occur during February and March. West of Bornholm the fishery is taking place during most of the year, except for the summer-stop, depending on the TAC's. The fishery is a combined fishery with cod as a main target-species with a considerable by-catch of flatfish. It is primarily smaller vessels that participate in the fishery and the gears used are bottom trawl, Danish seine, gillnet, trapnet and hooks. However, larger foreign vessels do participate in shorter periods.

The sampling of cod follows the standard sampling scheme, however it is performed by the size-grade-class stratification defined in EC standards from size-grade 1-5. In practise, at least one sample will be collected per size-grade-class and during the high season (summer) more intensive ensuring samples from each size-class.

If cod appears as by-catch in samples collected from other fisheries all individuals are sampled, length measured and aged. Data are treated as for the samples of cod taken from landings designated for human consumption.

This stock is not subject to other biological analysis.

Salmon

The Danish landings in 2001 were 88,388 individuals and the Danish TAC in 2002 is 97,509 individuals corresponding to 27 % of the EC share TAC, obliging Denmark to sample this stock.

The Danish salmon fishery is combined of a longline fishery from November to March and a driftnet fishery in the remaining months of the year except from a few summer-months, where there is no fishing for salmon. However, the majority of the fishing is taking place during September, October, and January. Approximately 25 vessels participate in the salmon fishery and none of these are full-time engaged in fishing.

The sampling of salmon is following the standard sampling scheme. In practise the sampling is done from 2 auction-halls in Bornholm where all landings are made. The sampling is size-class stratified and scales are taken from all size-classes. The scales are analysed at DIFRES.

The purpose of the other biological sampling is to estimate on a yearly basis the distribution of wild and reared salmon in the total landings of salmon.

In addition, the scales of wild and reared salmon will be compared in order to determine whether this feature is a method for routine distinction between the two types of salmon.

3.5.3 ICES AREA IIIa North and South

Blue whiting

The Danish landings in 2001 were 2,327 tonnes. No separate TAC is set for this area. Denmark will sample this stock.

The Danish fishery for blue whiting in ICES area IIIA is entirely for production of fish meal and oil purposes. The catches are taken all year round with a high season in summer.

Standard sampling procedure as described in 3.5.1. will be used.

This stock is not subject to other biological analysis.

Sprat

The Danish landings in 2001 were 33,750 tonnes and the Danish TAC for 2002 is 33,500 tonnes corresponding to 72 % of the EC share TAC, obliging Denmark to sample this stock.

Small to medium sized trawlers using mesh sizes less than 32 mm participate in the sprat fishery that is exclusively for industrial purposes, and thus all mesh sizes are less than 32 mm. of size. Most catches are made during the 2nd and 4th quarter

Standard sampling procedure as described in 3.5.1. will be used.

Sex and maturity stage is obtained from the individuals selected for ageing in each sample. The maturity estimates after aggregation has a CV which do not exceed 5% for the interval of 20-90% of the mature fish. The sex and maturity is determined following an international key (F. E. Alekseejev & E. I. Alekseejeva 1996).

Hake

The Danish landings in 2001 were 303 tonnes and the Danish TAC for 2002 is 749 tonnes corresponding to 92 % of the EC share TAC, obliging Denmark to sample this stock.

Hake is caught as by-catch in the fishery from gill-net vessels using mesh sizes larger than 120 mm and as by-catch in human consumption trawl fishery . Hake is mostly landed during summer.

The sampling of hake follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-4. At least one sample will be collected from each size grade.

This stock is not subject to other biological analysis.

Haddock

The Danish landings in 2001 were 1,345 tonnes and the Danish TAC in 2002 is 3,937 tonnes corresponding to 84 % of the EC share TAC, obliging Denmark to sample this stock.

Haddock is landed all year round and only for human consumption purposes. Trawlers using gear with a mesh-size larger than 90 mm undertakes the fishery.

The sampling of haddock follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-3.

In cases where haddock appears as by-catch in the small meshed fishery all individuals sampled will be length measured and aged

This stock is not subject to other biological analysis.

Mackerel

The Danish landings in 2001 were 1,801 tonnes. No separated TAC is given for this area. Denmark will sample this stock.

Mackerel is landed during autumn and winter only for human consumption purposes. The fishery is undertaken by trawlers and purse seiners all using gear with a mesh-size larger than 32 mm.

Standard sampling procedure as described in 3.5.1. will be used.

This stock is not subject to other biological analysis.

Saithe

The Danish landings in 2001 were 1,054 tonnes. No separated TAC is given for this area. See Saithe in Area IV. Denmark will sample this stock in connection with the sampling from the fishery in the North Sea.

Saithe is landed all year round only for human consumption purposes. The fishery is undertaken by trawlers and gillnet vessels all using trawls and gill nets with a mesh-size larger than 90 mm.

The sampling of saithe follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-4. At least one sample per size grade will be collected.

This stock is not subject to other biological analysis.

Plaice

The Danish landings in 2001 were 8,612 tonnes in IIIa North (the Skagerrak) and 1,975 tonnes in IIIa South (the Kattegat). The quotas for 2002 is set at 4,983 tonnes for the Skagerrak and 1,424 tonnes for the Kattegat which corresponds to 79% and 89 % respectively. This obliges Denmark to sample this stock.

Plaice is caught both as a target species for smaller trawlers and gillnet vessels, and as by-catches in the nephrops and cod fishery. The catches are taken all year round and only for human consumption purposes. The gears used in the nephrops fishery is at least 70 mm and in other demersal human consumption fishery mesh-sizes larger than 90 mm.

The sampling of plaice follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-4. At least one sample per size-grade per season will be collected.

This stock is not subject to other biological analysis.

Herring

The Danish human consumption landings in 2001 were 34,749 tonnes and the Danish TAC in 2002 is 33,379 tonnes corresponding to 48 % of the EC share TAC, and landings of by-catches of herring in the small meshed fishery in 2001 were estimated to app. 9,800 tonnes and the by-catch ceiling for herring set for Denmark in 2002 is 17,949 tonnes. These landings and TAC's obliging Denmark to sample this stock.

The herring human consumption fishing fleet in Division IIIa consists of trawler and purse seiners using mesh sizes larger than 32mm and the landings of herring are landed for human consumption purposes. The fishery is mainly occurring during June to October. By-catches of herring the small meshed fishery occur and these landings are used for fish meal and oil production.

The herring population in this area is composed of 3 stocks, and the sampling is performed on the following categories (Article 11.1.a.ii):

a) Autumn spawners from the North Sea.
b) Spring spawners from the Western Baltic.
c) Winter spawners both from the English Channel and local populations.

All revision of data and assessment are done on these spawning types.

Standard sampling procedure as described in 3.5.1. will be used.

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

Sex and maturity stages are obtained from the individuals randomly selected for ageing in each sample. The maturity estimates after aggregations have a CV which do not exceed 5% for the interval of 20-90% of the mature fish. The sex and maturity are determined following an international 8 scale maturity key. The spawning type is determined from the otoliths following an intern manual (Mosegaard, H, L.A. Worsøe, and M. Lindberg 1999)

Sandeel

The Danish landings in 2001 were 18,894 tonnes. No separated TAC is given for this area. Denmark will sample this stock.

Sandeel is caught as a target species for trawlers. The catches are taken mainly during the 2nd quarter and are used for reduction purposes. The gears used have mesh-sizes less than 16 mm.

Standard sampling procedure as described in 3.5.1. will be used.

This stock is not subject to other biological analysis.

Sole

The Danish landings in 2001 were 486 tonnes and the Danish TAC for 2002 is 420 tonnes corresponding to 84 % of the EC share TAC, obliging Denmark to sample this stock.

Sole is caught as a target species for smaller trawlers and gillnet vessels. The catches are taken during the 2nd and 3rd quarter and only for human consumption purposes. The gears used have mesh-sizes larger than 70 mm.

The sampling of sole follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-3. At least one sample will be collected by size-grade during the high season.

This stock is not subject to other biological analysis.

Cod

The Danish landings in 2001 for the Skagerrak was 5,041 tonnes and for the Kattegat 2,407 tonnes. The Danish TAC for 2002 is 5,680 tonnes in the Skagerrak and 1,728 tonnes for the Kattegat corresponding to 83% and 62% respectively for the two areas of the EC share TAC. This obliges Denmark to sample this stock.

The cod fishery is taking place during all year and a major part of the cod fishery is done by trawlers and to a lesser extent by gillnets vessels (mainly during the winter). All gears used have a mesh size larger than 90 mm.

The sampling of cod follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-5. At least one sample will be collected by size-grade per season. In cases where cod appears as by-catch in the small meshed fishery all individuals are sampled, length measured and aged. Data are treated as for the samples of cod taken from landings designated for human consumption.

This stock is not subject to other biological analysis.

Norway lobster (Nephrops)

The Danish landings in 2001 were 2,865 tonnes and the Danish TAC in 2002 is set at 3,307 tonnes corresponding to 74 % of the EC share TAC, which obliging Denmark to sample this stock.

Nephrops is landed all year round and only for human consumption purposes. Trawlers using gear with a mesh-size larger than 70 mm undertakes the fishery.

The sampling of nephrops follows the standard sampling scheme. No size grade is used for this species.

This stock is not subject to other biological analysis.

3.5.4 ICES AREA II.

Atlanto-Scandian Herring

The Danish landings in 2001 in Denmark were 7,288 tonnes and in third countries were 16,504 tonnes. The Danish TAC for 2002 is 25,750 tonnes corresponding to 35 % of the EC share TAC, which obliging Denmark to sample this stock.

Atlanto-Scandian herring is landed during spring only for human consumption purposes. Purse seines using gear with a mesh-size between 32 and 40 mm undertakes this fishery.

As a major part of Danish landings of Atlanto-Scandian herring is taken place in Norway, an arrangement concerning sampling of these landings will tried to be set up with Norway, as a supplement to the standard sampling in Denmark.

The purpose of the other biological sampling is to estimate on a yearly basis the distribution of sex, maturity and per age.
Sex and maturity stage is obtained from the individuals selected for ageing in each sample. The maturity estimates after aggregation has a CV which do not exceed 5% for the interval of 20-90% of the mature fish. The sex and maturity is determined following an international 8 scale maturity key.

Blue whiting´

See Blue whiting in Section 3.5.5 ICES AREA IV

3.5.5 ICES AREA IV

Sandeel

The Danish landings in 2001 were 646,892 tonnes and the Danish TAC for 2002 is 814,000 tonnes corresponding to 94 % of the EC share TAC, which obliging Denmark to sample this stock.

Sandeel caught in the ICES area IV are landed exclusively for reduction purposes and the fishery is undertaken by trawler using bottom-trawls with mesh-sizes less than 16 mm. Sandeels are landed from early spring to late summer.

Standard sampling procedure as described in 3.5.1.

This stock is not subject to other biological analysis.

Anglerfish

The Danish landings in 2001 were 1,383 tonnes and the Danish TAC for 2002 is set at 818 tonnes corresponding to was 7,8 % of the EC share TAC. This level obliging Denmark to sample this stock.

Anglerfish caught in the ICES area IV are landed exclusively for human consumption purposes and most of the landings are taken as by-catch in all the Danish demersal trawl fishery.

The sampling of anglerfish follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-4. At least one sampler per size-grade will be collected.

The Danish sampling of this stock is due to the low Danish catch limited. It is therefore disproportionate expensive to train and maintain skills in age determinating this species.

Therefore, Denmark requests for derogation for age determinating this species. Sampling and length measurements will be carried out according to the levels described in the Data Directive.

This stock is not subject to other biological analysis.

Blue whiting

The Danish landings in 2001 from fisheries in IIa and IV were 45,394 tonnes and the Danish TAC for 2002 for this combined area is set at 26,846 corresponding to 97 % of the EC share TAC, which obliging Denmark to sample this stock.

Blue whiting is landed all year round exclusively for reduction purposes. In the directed fishery for blue whiting trawl with a mesh size of 40 mm is used. Blue whiting is also caught as by-catch in the Norway pout fishery and in this fishery trawls with a mesh-size less than 32 mm are used.

Standard sampling procedure as described in 3.5.1.

This stock is not subject to other biological analysis.

Sprat

The Danish landings in 20001 were 169,577 tonnes and the Danish TAC for 2002 is set at 204,100 tonnes corresponding to 88 % of the EC share TAC, which obliging Denmark to sample this stock.

Trawlers using mesh-size less than 32 mm conducts this fishery and all landings of sprat are landed for reduction purposes during the period from August to March.

Standard sampling procedure as described in 3.5.1.

The purpose of the other biological sampling is to estimate on a yearly basis the distribution of sex, maturity per age. Sex and maturity stage is obtained from the individuals selected for ageing in each sample. The maturity estimates after aggregation has a CV which do not exceed 5% for the interval of 20-90% of the mature fish. The sex and maturity is determined following an international maturity key (F. E. Alekseejev & E. I. Alekseejeva 1996).

Horse mackerel

The Danish landings in 2001 were 2,203 tonnes in the areas II and IV and the Danish TAC for 2002 is set at 33,630 tonnes corresponding to 68 % of the EC share TAC, which obliging Denmark to sample this stock.

Most of the catches of horse mackerel are taken as by-catch in the small meshed fishery which is carried out mainly by large trawlers during winter and landed for reduction purposes.

The purpose is to estimate the number of fish and their mean weight at age of horse mackerel from ICES area IV landed in Denmark. However, a target-oriented sampling is not possible as horse mackerel only appears as by-catch in landings for reduction purposes.

This stock is not subject to other biological analysis.

Hake

The Danish landings in 201 were 572 tonnes and the Danish TAC for 2002 is set at 547 tonnes corresponding to 58 % of the EC share TAC, which obliging Denmark to sample this stock…

Hake is caught as by-catch by demersal trawlers and by gill-net vessels using mesh sizes larger than 120 mm. Hake is mainly landed during summer.

The sampling of hake follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-4. At least one sample per size-grade will be collected.

This stock is not subject to other biological analysis.

Norway lobster (Nephrops)

The Danish landings in 2001 were 1,907 tonnes (including catches in Norwegian zone) and the Danish TAC (EC zone) in 2002 is set at 870 tonnes corresponding to 5 % of the EC share TAC, which obliging Denmark to sample this stock. Even though the Danish TAC of the EC is 5%, Denmark will sample landings taken in the North Sea of this species.

Nephrops is landed all year round and only for human consumption purposes. Trawlers using gear with a mesh-size larger than 70 mm undertakes the fishery.

The sampling of nephrops follows the standard sampling scheme. No size grade is used for this species.

This stock is not subject to other biological analysis.

Mackerel

The Danish landings in 2001 (areas IIIa and IV) were 21,464 tonnes and the Danish TAC for 2002 is set at 28,562 tonnes (areas IIa, IIIa and IV) corresponding to 72 % of the EC share TAC, which obliging Denmark to sample this stock.

Mackerel is landed during autumn and winter only for human consumption purposes. The fishery is carried out by trawlers and purse seines all using gear with a mesh-size larger than 32 mm

Standard sampling procedure as described in 3.5.1.

This stock is not subject to other biological analysis.

Turbot

The Danish landings in 2001 were 495 tonnes and the Danish TAC for 2002 is set at 1,058 tonnes corresponding to 16 % of the EC share TAC, which obliging Denmark to sample this stock.

Turbot is caught as by-catch in the fishery from vessels using either gill-net vessels or bottom trawls. Turbot is mainly landed during spring and summer by gill-net vessels using mesh-sizes larger than 200mm.

The sampling of turbot follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-4. At least one sample per size-grade will be collected.

This stock is not subject to other biological analysis.

Plaice.

The Danish landings in 2001 were 12,061 tonnes and the Danish TAC for 2002 is set at 14,622 tonnes corresponding to 20 % of the EC share TAC, which obliging Denmark to sample this stock.

The fishery for plaice is carried out by a variety of vessel types: trawlers, gill netters, Danish seiners and beam-trawlers. All gears are having mesh-sizes larger than 120 mm. Plaice is landed all year round.

The sampling of plaice follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-4. At least one sample per size-grade will be collected per season.

This stock is not subject to other biological analysis.

Lemon sole

The Danish landings in 2001 were 1,827 tonnes and the Danish TAC for 2002 is set at 1,450 tonnes corresponding to 15 % of the EC share TAC, which obliging Denmark to sample this stock.

The fishery for lemon sole is carried out by a variety of vessel types: trawlers, gill netters, Danish seiners and beam-trawlers. The landings are made all year round.

The sampling of lemon sole follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-2. At least one sample per size-grade will be collected.

This stock is not subject to other biological analysis.

Herring

The Danish landings in 2001 were 36,910 tonnes and the Danish TAC for 2002 is set at 38,456 tonnes corresponding to 20 % of the EC share TAC. A by-catch ceiling for herring for 2002 is set at 34,462 tonnes and the landings for 2001 were 20,350 tonnes. This obliges Denmark to sample this stock.
The herring fishing fleet in ICES area IV consists of purse seiners and trawlers both using mesh-sizes larger than 32mm and the herring is landed for human consumption purposes. The fishery is mainly occurring during October to May. By-catches of herring taken in the small meshed fishery for sandeel, sprat and Norway pout is estimated in 2001 to 20,350 tonnes.

Standard sampling procedure as described in 3.5.1.

The purpose of the other biological sampling is to estimate on a yearly basis the distribution of sex, maturity per age and stock and in addition, to determine the spawningtype of the individual herring.

Sex and maturity stage is obtained from the individuals randomly selected for ageing in each sample. The maturity estimates after aggregation has a CV which do not exceed 5% for the interval of 20-90% of the mature fish. The sex and maturity is determined following an international key. The spawningtype is determined from the otoliths following an intern manual (Mosegaard, H, L.A. Worsøe, and M. Lindberg 1999)

Norway pout

The Danish landings in 2001 were 62,653 tonnes and the Danish TAC for 2002 is set at 220,340 tonnes corresponding to 99 % of the EC share TAC, which obliging Denmark to sample this stock.

Norway pout is mainly during autumn and winter. All the landing are made by demersal trawlers and used for reduction purposes.

Standard sampling procedure as described in 3.5.1.

This stock is not subject to other biological analysis.

Cod

The Danish landings in 2001 were 8,814 tonnes and the Danish TAC for 2002 is set at ´8,473 tonnes corresponding to 20 % of the EC share TAC, which obliging Denmark to sample this stock.

The cod fishery is carried out during all seasons. The landings of cod are made by demersal trawler, gill netters and Danish seiners. All gears used have a mesh size larger than 120 mm.

The sampling of cod follows the standard sampling scheme, however it is performed by the size-class stratification defined in EC standards from 1-5. At least one sample per size-grade will be collected per season and fishery.

However, as the cod fishery is heavily regulated at the present, the sampling aim may not be realistic, though it will be attempted completed. From the samples 50 individuals are length measured and 25 of these aged, both selected on a random basis.

In cases where cod appears as by-catch in the small meshed fishery all individuals are sampled, length measured and aged. Data are treated as for the samples of cod taken from landings designated for human consumption.

This stock is not subject to other biological analysis.

Extended Programme:

No data collection according to the provisions in the Data Directive Chapter H. Biological sampling of catches: composition by age and by length, and in Chapter I. Other biological samplings, will be carried out within the framework of the extended programme.

4. Module of evaluation of the economic situation of the sector

4.1 J. Collection of economic data by groups of vessels

The Danish programme for Section J covering the information for the Community Programme, as defined in appendix XVII and XVIII, will be completed by two sources of data. The first being register data from the administrative and statistical registers of the Danish Directorate of Fisheries (FD) and secondly by sample statistics compiled at the Danish Research Institute of Food Economics (FOI).

Each year FOI obtain an extract from the FD registers containing information on all active vessels for the year before. This extract forms the basis for the analysis and stratification of the population before the sample for the years account statistics is drawn. The register extract covers the whole economically active population and will together with the account statistics form the basis for reporting data on the EConomic situation for the vessel groups.

4.1.1 Data for basic economic evaluation

Minimum Programme

1. Statistics based on register data:

- Vessel data. The physical data for the vessels are verified according to the FD register of fishing vessels, that is the number of vessels, gross tonnage (GT), engine power (kW), and age of vessel.

- Effort. Vessel activity measured as days at sea according to the FD register of logbooks.

- Prices. Quarterly data on prices will be prepared using statistical files produced by FD based on the sales note register.

2. Sample statistics:

- Income / turnover: Value of production by species.

- Production costs: Labour costs, fuel, repair and maintenance, other operational costs.

- Fixed costs: Depreciation calculated individually by a fixed percentage based on expected lifetime.

- Financial position: Own capital / borrowed capital.

- Invested capital: Replacement value of fishery assets at the beginning of the year. Insured values could also be included, but must be considered second best to the book value (replacement value).

- Employment: Calculated number of employed (part time / full time).

4.1.2 Supplementary data for improving the economic evaluation

Extended programme

Some of the entries in appendix XVIII of the Commission Regulation may call for specific pilot studies in order to access the possibilities to fulfil the requirements. For instance regional differentiation of costs by ICES subdivisions is not easily accomplished when many vessels have fishing trips in several subdivisions.

1. Statistics based on register data:

- Prices. Monthly data on prices prepared using statistical files produced by FD based on the sales note register.

- Production. Nominal catch in tonnes per species. Seasonal (monthly) data and by stock (ICES area) information could possible be prepared using the statistical files from FD.

2. Sample statistics:

- Production. Nominal catch in tonnes per species. Seasonal (monthly) data and by stock (ICES area) data is not considered to be comprehensive for the account forms. But the register based statistics could complement the account statistics in this respect.

- Income/revenue/turnover. Subsidies separated from other income from fishery.

- Production costs. Further break down of operational costs into subgroups.

- Invested capital. Break down into type of fishery assets, for instance vessel (hull), engines and winches, electronic equipment, fishing gear, sheds/gear house, trucks or vans etc.

- Effort. The data for vessel activity are verified according to the FD register of logbooks. That is the number of days at sea and use of gear for each vessel.

- Employment: Separately calculated for the owner, partners, hired skippers and crew.

4.1.3 Compiling sample statistics

FOI compile economic data based on balanced accounts drawn up by the individual fisherman's accountant following rules issued by the institute. The participation of the fisherman is on voluntary basis established by a previously given promise to allow their accountant to submit their data to the institute.

The accounts for each fisherman will be tested at the institute, and all errors and ambiguities will be addressed and verified in cooperation with the reporting accountant, before the accounts are approved for statistical use. The accountants will be entitled to remuneration for each reported and approved account.

The accounting form includes all specifications needed for the minimum programme as well as most of the specifications mentioned in the extended programme.

The population from which the sample will be drawn is defined by all fishing firms with a total value of landings of fish, crustaceans and molluscs, which is above 201.000 DKK (approx. 27.000 ECR). By this definition the population comprises about 1500 fishing firms, who cover 99% of all Danish commercial fisheries.

The population is stratified by five variables:

- Economic size classes
- Product combination (most important fish species)
- Fleet segment as defined in appendix III to Regulation (EC) No. 1639/2001.
- Age group (fisherman's age)
- Region

With economic size and product combination as the primary stratifying variables.

For stratification into economic size classes and product combination categories the production of each fishing firm has been converted to Standard Catch Value (SCV) by weighting the catch of each species relative to the importance of that species for the fishery as a whole, the weight being the average prices for each species for the last 3 year period calculated on a live weight basis.

The sample comprises more than 20 per cent of the total production. The basic stratification for extracting the sample arises from combining 11 economic size groups with 18 groups of product combinations. This matrix is used when calculating the optimal allocation given a set of restrains like number of units and the total SCV for separate groupings. This method generates selection percentages, which increases with increasing economic size of the firms, because the number of firms reduces simultaneously to an increase in the variances on the accounts figures. The selection percentage varies from 11 per cent for the small size groups to 38-40 per cent for the biggest size groups.

The precision level or the uncertainty on the results cannot be calculated by approximation to a distribution function, because it is not possible to carry out a random sampling. The element of voluntary participation has the result, that only a part of each stratum is available for selection. The most important task for improving the precision level is to increase the willingness among the fishermen to participate in the selection population. Through contact to the Fishermen's Organisation and accountants for fishermen the Institute has recently succeeded in gaining a 15 per cent increase in the number of fishermen to participate in the statistics. This strategy will be followed up by selective enquiries to recruit fishermen in the strata where the participation needs improvement.

From the year 2001 the population has been adapted to include separate units for all economically active vessels with an overall length of 12 metres and above. Complementary herewith all reported accounts in the sample now must include individual cost calculations for each operative vessel in those cases where the fishing firm has more than one separately operating vessel. In that way both the population

structure as well as the weighting procedure enables calculation of statistics by vessel units.

At present the number of firms in the sample is 325 and the remuneration to the fisherman's accountant is about 365 ECR per reported account. It may be necessary to increase the number of accounts in order to meet the required prECision for all fleet segments.

In the extended programme the more elaborate distinction based on number of days performing a specific type of fishing technique may be implemented. This is not fully identical with fleet segment though there may be a high degree of correlation between fleet segment and use of gear type.

4.1.4 Submission of data

All information required in the minimum programme is specified in the FOI accounting forms for fishery. In possible co-operation with other Member States all statistical information will be aggregated to the harmonized variables as specified in the appendix to the Commission Regulation. Data will for each group of vessels (fleet segments) be prepared as totals and average per vessel.

4.2 K. Collection of data concerning the processing industry

The Danish programme for Section K is to conduct studies analysing the possibilities for collection and managing of data concerning the processing industry.

Data for basic economic evaluation per primary and secondary industry by sectors.

General description	**Minimum programme** **1. Priority (annual)**
Raw material	Total and per species (tonne)
Income (turn-over)	Total and per product
Production costs: - Labour - Energy - Raw material (value) - Packaging - Other running costs	Total and per category cost
Fixed costs	Average costs, calculated from investment
Financial position	Share of own / borrowed capital
Investment (asset)	- Historical - Replacement - Insurance
Prices / product	Value, tonne
Employment	Numbers / FTE
Capacity utilisation	Annual average

4.2.1 General description of the studies to collect data concerning the Danish fish processing industry

1. Examination and analysis of the existing collection of data by Statistics Denmark, The Directorate of Fisheries, and other relevant Authorities.
2. Analyse the need for collection of complementary data.
3. On the basis of the analyses, if it's possible and there is a need for it, work out a plan for collecting more data on the processing industry in Denmark.
4. Collection, evaluation and adaptation of complementary data.
5. Evaluation and reporting to the Commission.

- **Raw material**

For the gathering of data concerning the use of raw material in the processing industry, the data concerning catches and landings in Denmark collected by The Directorate of Fisheries may be used.

These data will probably not be sufficient and the possibility for collection of alternative data must therefore be analysed. The alternative data collection will concentrate on examining the existing data collected by Statistics Denmark in

Commodity Sales Statistics, Commodity Purchase Statistics, Accounts Statistics and National Accounts.

The data collected by The Directorate of Fisheries on first hand sale of fish per species from Danish auctions may be used to confirm or control the other data.

- **Income**
- **Prices / product**

Calculation of the total income and per product income in the processing industry per product.

The starting point for this analysis will be the balance on price per product in Statistics Denmark Commodity Statistics, where every single product is specified by it's key in The Combined Nomenclature. For all products the amount sold is given in tonnes and the corresponding value in 1,000 DKK.

Going through these data it will be analysed in which case the data can be used directly or in which case it will be necessary to work out new data.

- **Production costs**

- **Fixed costs**
- **Financial position**
- **Investment**
- **Employment**

The collection of the following data: production costs, fixed costs, financial position, investment and employment is described together because the foundation on which the data is collected is the same. The data is collected by Statistics Denmark in Accounts Statistics.

The key point is to investigate the existing data collected by Statistics Denmark for the use of an analysis of the Danish fish processing industry. If possible FOI will co-operate with Statistics Denmark in finding a solution to this part of the project.

FOI will analyse the relevant data collected in Statistics Denmark's Commodity Statistics and Accounts Statistics for a description of the Danish fish processing industry, and evaluate the possibilities to provide new data for special types of commodities and branches.

Analyse data used for separating pure groups with only fish processing establishment and groups, which only partly consist of fish processing establishment, and addressing the possibilities for selecting the fish processing establishment inside these groups.

Going through these data it will be analysed in which case the data can be used directly or in which case it will be necessary to work out new data.

In the process of collecting data concerning the Danish fish processing industry there can be problems referring to confidentiality of the data given by the industry.

- **Capacity utilisation**

Capacity utilisation is not estimated for the Danish processing industry at present.

To estimate capacity utilisation FOI will have to look at the parameters that describe the capacity in the Danish processing industry.

The analysis will be accomplished in collaboration among the relevant institutions and organisations to give the best possible evaluation to measure the capacity and which parameters that best can describe the capacity in the Danish processing industry.

4.2.2 Extended programme

To comply with the extended programme FOI will have to finish the studies in order to disclose missing data and evaluate the possibilities to provide this data. On this basis FOI will make an evaluation and a description of the project to fulfil the extended programme. It will therefore not be possible to make a precise project description of the extended programme at present.

5. Danish Fisheries Analyses Database (DFAD)

As mentioned in Section 1 all data collected according to the provisions concerning logbooks, sales notes and registration of fishing vessels and the primary data collected under the Danish programme will all be stored in the following computerised databases:

- Vessel register. Data on fishing capacity. (FD)
- Logbook database. Data on origin of catches and on effort. (FD)
- Sales notes database. Data on quantities landed and prices. (FD)
- Species composition database. Data on species composition in landings for industrial purposes. (FD)
- Biological database. Data on discards and biological parameters. (DIFRES)
- Economic data. (FOI)

In order, for the three involved institutes, to use the same primary data on capacity, effort, and geographical distribution of the origin of the landings a common database will be produced, the Danish Fisheries Analyses Database (DFAD). This database is be a database where data from the register on Danish fishing vessels, data from the Danish logbooks and the catch area declarations database together with data from the Danish sales notes database are merged. It is therefore possible to gain the possibility of categorise each landing in one fleet segment, in one fishery etc. This database will contain most of the information requested in research projects and in relation to fisheries management. The DFAD is quarterly and yearly updated.

It will, at a later stage, be possible to merge DFAD with information from the Biological database and the Economic database.

The design and maintenance of the database is made in a co-operation between the three above mentioned institutes.

6. References.

ICES 1994. Manual for the Herring Hydro Acoustic Surveys ICES CM 1994/H:3

ICES 1995. Report of the ICES Workshop on sandeel otolith analysis. ICES C.M. 19957G:4.

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

ICES 2000. Manual for the Baltic International Trawl Surveys. ICES CM 2000/H:02

Lewy, P. 1996. A generalized Dirichlet distribution accounting for singularities of the variables. Biomatrics 52, 1394-1409.

Lewy, P. 1995. Sampling methods and errors in the Danish North Sea industrial fishery. Dana, vol. 11(1), 39-64.

Mosegaard, H, L.A. Worsøe, and M. Lindberg 1999: ”Use of otolith microstructure to separate spring-and autumn spawners”. Intern manual in a EC projECt CFP 96/073: Separation of spring and autumn spawning herring in the Skagerrak and Kattegat.

F. E. Alekseejev & E. I. Alekseejeva 1996. Assessment of gonades maturity stages and study of sex-cycles, fECundity, eggs production and matuaration rate of marine commercial fishes. Methodical manual. Kaliningrad, ATLANTNIRO)

7. Addresses and contact persons

Danish Institute for Fisheries Research
Jægersborgvej 64-66
DK-2800 Kgs. Lyngby
Denmark
Phone: +45 33 96 33 00
Fax: +45 33 96 33 49
E-mail: hfi@dfu.min.dk

Contact person: Jørgen Dalskov, Fishery Adviser, Head of Division
Phone: + 45 33 96 33 80
E-mail: jd@dfu.min.dk

Danish Directorate of Fisheries
Stormgade 2
DK-1470 København K
Denmark
Phone: +45 33 96 30 00
Fax: + 45 33 96 39 03
E-mail: fd@fd.dk

Contact person: John Kjersgaard, Head of Department
Phone: + 45 33 96 35 08
E-mail: jkj@fd.dk

Danish Research Institute of Food Economics
Rolighedsvej 25
DK-1958 Frederiksberg C
Denmark
Phone: + 45 35 28 68 00
Fax: + 45 35 28 68 03
E-mail FOI@FOI.dk

Contact person: Kim Normark Andersen, Senior Economic Adviser
Phone: + 45 35 28 68 42
E-mail: kna@FOI.dk

8. Appendixes

Appendix I. Conversion factors from gutted weight to live weight.

GUTTED, WITH HEAD:

COD	1.18
HADDOCK	1.18
WHITING	1.18
HAKE	1.18
LING	1.18
SAITHE	1.18
POLLACK	1.18
PLAICE	1.05
SOLE	1.05
EUROPEAN FLOUNDER	1.05
DAB	1.05
TURBOT	1.05
BRILL	1.05
LEMON SOLE	1.05
WITCH FLOUNDER	1.05
ATLANTIC HALIBUT	1.05
PORBEAGLE	1.33
PICKED DOGFISH	1.33
SALMON	1.10

GUTTED, WITHOUT HEAD:

COD	1.60
MONK	2.72

TAIL:

NORWAY LOBSTER	3.33

Appendix II.

Species	Area	Landings in 2001 (tonnes).	Beforehand estimates		Yearly discard sampling required (Y/N)	Sampling frequency rules[1)]				Sampling frequency			
			Discard rates (weight)	Discard rates. (numbers)		Length measurement	Sampling Age readings	Number of individuals length measured pr. sample	Number of fish aged pr. sample	Number of length samples	Number of individuals measured	Number of age samples	Number of fish aged
Anglerfish	IIa, IVa-c	1758	<10%	<20%	N	1:200	1:200	25	25				
Atlanto-Scandian Herring	IIa	7288	<10%	<20%	N	1:1000	1:1000	50	25				
Blue whiting	I, II, V, VI, VII, XII, & XIV	51897	<10%	<20%	N	1:1000	1:1000	50	50				
Cod	IIIaN	5041	>10%	>20%	Y	1:100	1:100	50	25	50	2521	50	1260
Cod	IIIaS	2407	>10%	>20%	Y	1:100	1:100	50	50	24	1204	24	1204
Cod	IIIbcd	25462	>10%	>20%	Y	1:200	1:200	50	25	127	6366	127	3183
Cod	IVa-c	8814	>10%	>20%	Y	1:200	1:200	50	25	44	2204	44	1102
Dab & Flounder	IVa-c	737	>10%	>20%	N								
Haddock	IIIa	1345	<10%	>20%	N								
Haddock	IVa-c	2026	<10%	>20%	Y	1:200	1:200	50	25	10	507	10	253
Hake	IIIa	303	<10%	<20%	N	1:100	1:100	50	50				
Hake	IVa-c	572	<10%	<20%	N								
Herring	IIIa	34749	<10%	<20%	N	1:1000	1:1000	100	100				
Herring	IIIbcd	46297	<10%	<20%	N	1:1000	1:1000	100	100				
Herring	IVa-c	36910	<10%	>20%	Y	1:1000	1:1000	50	25	37	1846	37	923
Horse mackerel	II & IVa-c	2203	<10%	<20%	N	1:1000	1:1000	100	25				
Horse mackerel	Vb, VI, VII, VIII, XII, XIV	21156	<10%	<20%	N	1:1000	1:1000	50	25				
Lemon sole	IVa-c	1827	<10%	<20%	N	1:200	1:200	25	25				

Mackerel	IVa-c, IIIbcd	21464	<10%	>20%	Y	1:1000	1:1000	50	25	21	1073	21	537
Mackerel	Vb	293	<10%	<20%	N	1:1000	1:1000	50	25				
Norway lobster	IIIa	2865	>10%	>20%	Y	1:100		200		29	5730	-	-
Norway lobster	IVa-c	1907	>10%	>20%	Y	1:100		200		19	3814	-	-
Norway pout	IIIa, IVa-c	62653	<10%	<20%	N	1:1000	1:1000	50	50				
Plaice	IIIaN	8612	>10%	>20%	Y	1:100	1:100	50	50	86	4306	86	4306
Plaice	IIIaS	1975	>10%	>20%	Y	1:100	1:100	50	50	20	988	20	988
Plaice	IIIbcd	1854	>10%	>20%	Y	1:100	1:100	50	50	19	927	19	927
Plaice	IVa-c	12061	>10%	>20%	Y	1:100	1:100	50	50	121	6031	121	6031
Saithe	IIa, IIIbcd, IVa-c	2998	>10%	>20%	Y	1:100	1:100	50	50	30	1499	30	1499
Salmon	IIIb-d (in numbers)	88388	<10%	<20%	N	1:100	1:100	50	50				
Sandeel	IVa-c (incl. Norw. Waters)	646892	<10%	<20%	N	1:2000	1:2000	50	50				
Shrimp	IIIa	1078	<10%	<20%	N	1:100		400					
Shrimp	IIa, (north and south of 62.00)	1864	<10%	<20%	N	1:200		100					
Sole	IIIa	486	>10%	>20%	Y	1:50	1:50	100	100	10	972	10	972
Sole	IVa-c	592	>10%	>20%	Y	1:200	1:200	50	25	3	148	3	74
Sprat	IIIa	33750	<10%	<20%	N	1:2000	1:2000	100	50				
Sprat	IIIbcd	51242	<10%	<20%	N	1:1000	1:1000	100	50				
Sprat	IVa-c,VIId	169577	<10%	<20%	N	1:2000	1:2000	50	50				
Turbot & Brill	IVa-c, VIId	495	<10%	<20%	N	1:200	1:200	25	25				

Appendix IIIa. Calculation of Danish sampling effort by species and area based on landings made in Danish habours. (Danish landings)

Species	Area	Total EU TAC in 2002	Danish TAC in 2002	Danish TAC in %	DK landings in DK in 2001 (tonnes)
Anglerfish	IIa, IVa-c	10,500	818	7.8	1,758
Atlanto-Scandian Herring	IIa	73,840	25,750	34.9	7,288
Blue whiting	I, II, iV, V, VI, VII, XII, & XIV	107,281	30,564	28.5	51,897
Cod	IIIaN	6,870	5,680	82.7	5,041
Cod	IIIaS	2,800	1,728	61.7	2,407
Cod	IIIbcd	48,884	21,132	43.2	25,462
Cod	IVa-c	41,620	8,473	20.4	8,814
Haddock	IIIa	4,680	3,937	84.1	1,345
Haddock	IVa-c	77,935	5,618	7.2	2,026
Hake	IIIa	813	749	92.1	303
Hake	IVa-c	946	547	57.8	572
Herring	IIIa	68,830	33,379	48.5	34,749
Herring	IIIbcd	108,700	12,337	11.3	46,297
Herring	IVa-c	189,000	38,456	20.3	36,910
Horse mackerel	II & IVa-c	49,400	33,630	68.1	2,203
Horse mackerel	Vb, VI, VII, VIII, XII, XIV	143,000	12,975	9.1	21,156
Lemon sole & Witch flounder	IVa-c	9,720	1,450	14.9	1,827
Mackerel	IVa-c, IIIa	39,898	28,562	71.6	21,464
Mackerel	Vb	4,566	4,566	100.0	293
Norway lobster	IIIa	4,500	3,307	73.5	2,865
Norway lobster	IVa-c	16,623	870	5.2	1,907
Norway pout	IIIa, IVa-c	223,000	220,340	98.8	62,653
Plaice	IIIaN	6,272	4,983	79.4	8,612
Plaice	IIIaS	1,600	1,424	89.0	1,975
Plaice	IIIbcd	3,200	2,700	84.4	1,854
Plaice	IVa-c	73,110	14,622	20.0	12,061
Saithe	IIa, IIIa, IIIbcd, IVa-c	66,150	5,598	8.5	2,998
Salmon (in numbers)	IIIb-d	358,377	97,509	27.2	88,388
Sandeel	IVa-c (incl. Norw. Waters)	1,013,000	956,567	94.4	646,892
Shrimp	IIIa	5,420	3,523	65.0	1,078
Shrimp	IIa, (north and south of 62.00)	5,920	4,526	76.5	1,864
Sole	IIIa	500	420	84.0	486
Sole	IVa-c	16,000	610	3.8	592
Sprat	IIIa	46,250	33,500	72.4	33,750
Sprat	IIIbcd	164,860		0.0	51,242
Sprat	IVa-c,VIId	232,000	204,100	88.0	169,577
Turbot & Brill	IVa-c, VIId	6,750	1,058	15.7	495

Appendix IIIb. Calculation of Danish sampling effort by species and area based on landings made in Danish habours. (other EU member states landings in DK)

Species	Area	Total EU TAC in 2002	Other member states landings in DK in 2001 (tonnes)
Anglerfish	IIa, IVa-c	10,500	105
Atlanto-Scandian Herring	IIa	73,840	5,755
Blue whiting	I, II, V, VI, VII, XII, & XIV	107,281	25,084
Cod	IIIaN	6,870	365
Cod	IIIaS	2,800	197
Cod	IIIbcd	48,884	4,238
Cod	IVa-c	41,620	2,187
Haddock	IIIa	4,680	227
Haddock	IVa-c	77,935	1,338
Hake	IIIa	813	8
Hake	IVa-c	946	77
Herring	IIIa	68,830	20,171
Herring	IIIbcd	108,700	42,906
Herring	IVa-c	189,000	6,738
Horse mackerel	II & IVa-c	49,400	37
Horse mackerel	Vb, VI, VII, VIII, XII, XIV	143,000	-
Lemon sole & Witch flounder	IVa-c	9,720	111
Mackerel	IVa-c, IIIbcd	39,898	5,404
Mackerel	Vb	4,566	7,211
Norway lobster	IIIa	4,500	26
Norway lobster	IVa-c	16,623	29
Norway pout	IIIa, IVa-c	223,000	-
Plaice	IIIaN	6,272	9
Plaice	IIIaS	1,600	8
Plaice	IIIbcd	3,200	7
Plaice	IVa-c	73,110	1,098
Saithe	IIa, IIIa, IIIbcd, IVa-c	66,150	5,951
Salmon (in numbers)	IIIb-d	358,377	73,000
Sandeel	IVa-c (incl. Norw. Waters)	1,013,000	35,297
Shrimp	IIIa	5,420	-
Shrimp	IIa, (north and south of 62.00)	5,920	-
Sole	IIIa	500	22
Sole	IVa-c	16,000	-
Sprat	IIIa	46,250	2,115
Sprat	IIIbcd	164,860	41,276
Sprat	IVa-c,VIId	232,000	1,245
Turbot & Brill	IVa-c, VIId	6,750	39

Appendix IIId. Calculation of Danish sampling effort by species and area based on landings made in Danish habours. (other EU member states landings in DK)

Species	Area	Sampling required yes=blank no=N other EU-landings 2001	Sampling Length measure-ment (1 sample per……. tonnes)	Sampling Age readings (1 sample per….. tonnes)	Number of fish measu-red pr. sample	Number of fish aged pr. sample	Estimated Number of samples from other EU landings in DK	Estimated Number of fish measured	EstimatedNumber of fish aged
Anglerfish	IIa, IVa-c		200	200	25	25	1	13	13
Atlanto-Scandian Herring *	IIa		1000	1000	50	25	6	288	144
Blue whiting	I,II,V,VI,VII,XII,XIV		1000	1000	50	25	25	1254	627
Cod	IIIaN		100	100	50	50	4	183	183
Cod	IIIaS		100	100	50	50	2	99	99
Cod	IIIbcd		200	200	50	25	21	1060	530
Cod	IVa-c		200	200	50	25	11	547	273
Haddock *	IIIa	N	100	100	50	50	2	114	114
Haddock *	IVa-c		200	200	50	25	7	335	167
Hake	IIIa	N	100	100	50	50	0	4	4
Hake	IVa-c	N	100	500	50	50	1	39	39
Herring	IIIa		1000	100	100	100	20	2017	2017
Herring	IIIbcd		1000	100	100	50	43	4291	2145
Herring	IVa-c		1000	100	50	25	7	337	168
Horse mackerel *	II, IVa-c	N	1000	100	100	25	0	4	1
Horse mackerel	Vb,VI,VII,VIII,XII,XIV	N	1000	100	50	25	0	0	0
Lemon sole and Witch flounder	IVa-c,	N	200	200	25	25	1	14	14
Mackerel	IVa-c, IIIbcd		500	500	100	100	11	1081	1081
Mackerel	Vb		1000	1000	50	25	7	361	180
Norway lobster	IIIa	N	100		200		0	52	0
Norway lobster	IVa-c	N	100		400		0	116	0
Norway pout *	IIIa, IVa-c	N	1000	1000	50	50	0	0	0
Plaice	IIIaN	N	100	100	50	50	0	5	5
Plaice	IIIaS	N	100	100	50	50	0	4	4
Plaice	IIIbcd	N	100	100	50	50	0	4	4
Plaice	IVa-c		500	500	50	25	2	110	55
Saithe	IIa, IIIa, IIIbcd, IVa-c		100	100	50	50	60	2976	2976
Salmon **	IIIb-d		20000	20000	50	50	4	183	183
Sandeel *	IVa-c, (incl. Norw. Wat.)		2000	2000	50	50	18	882	882
Shrimp *	IIIa	N	100		100		0	0	0
Shrimp *	IIa	N	500		100		0	0	0
Sole	IIIa	N	50	50	50	50	0	22	22
Sole	IVa-c	N	200	200	50	25	0	0	0
Sprat	IIIa		1000	1000	100	100	2	212	212
Sprat	IIIbcd		2000	2000	100	50	21	2064	1032
Sprat	IVa-c,VIId	N	2000	2000	50	50	1	31	31
Turbot & Brill	IVa-c, VIId	N	200	200	25	25	0	5	5

* For these species the number of samples are estimated from the landings in 2001.

** For salmon the quota is given in numbers. As the mean weight for salmons is 5 kilo we have calculated one sample for each 20.000 landed Salmons.

Appendix IIIc. Calculation of Danish sampling effort by species and area based on landings made in Danish habours. (Danish landings)

Species	Area	Sampling required yes=blank no=N DK 2001	Sampling Length measure-ment (1 sample per……. tonnes)	Sampling Age readings (1 sample per….. tonnes)	Number of fish measu-red pr. sample	Number of fish aged pr. sample	Estimated Number of samples from DK TAC	EstimatedNumber of fish measured	EstimatedNumber of fish aged
Anglerfish	IIa, IVa-c		200	200	25	25	4	102	102
Atlanto-Scandian Herring *	IIa		1000	1000	50	25	7	364	182
Blue whiting	I,II,V,VI,VII,XII,XIV		1000	1000	50	25	31	1528	764
Cod	IIIaN		100	100	50	50	57	2840	2840
Cod	IIIaS		100	100	50	50	17	864	864
Cod	IIIbcd		200	200	50	25	106	5283	2642
Cod	IVa-c		200	200	50	25	42	2118	1059
Haddock *	IIIa		100	100	50	50	13	673	673
Haddock *	IVa-c		200	200	50	25	10	507	253
Hake	IIIa		100	100	50	50	7	375	375
Hake	IVa-c		100	500	50	50	5	274	274
Herring	IIIa		1000	100	100	100	33	3338	3338
Herring	IIIbcd		1000	100	100	50	46	4630	2315
Herring	IVa-c		1000	100	50	25	38	1923	961
Horse mackerel *	II, IVa-c		1000	100	100	25	2	220	55
Horse mackerel	Vb,VI,VII,VIII,XII,XIV		1000	100	50	25	13	649	324
Lemon sole and Witch flounder	IVa-c,		200	200	25	25	7	181	181
Mackerel	IVa-c, IIIbcd		500	500	100	100	57	5712	5712
Mackerel	Vb		1000	1000	50	25	5	228	114
Norway lobster	IIIa		100		200		33	6614	0
Norway lobster	IVa-c		100		400		9	3480	0
Norway pout *	IIIa, IVa-c		1000	1000	50	50	63	3133	3133
Plaice	IIIaN		100	100	50	50	50	2492	2492
Plaice	IIIaS		100	100	50	50	14	712	712
Plaice	IIIbcd		100	100	50	50	27	1350	1350
Plaice	IVa-c		500	500	50	25	29	1462	731
Saithe	IIa, IIIa, IIIbcd, IVa-c		100	100	50	50	56	2799	2799
Salmon **	IIIb-d		20000	20000	50	50	5	244	244
Sandeel *	IVa-c, (incl. Norw. Wat.)		2000	2000	50	50	323	16172	16172
Shrimp *	IIIa		100		100		11	1078	0
Shrimp *	IIa		500		100		4	373	0
Sole	IIIa		50	50	50	50	8	420	420
Sole	IVa-c		200	200	50	25	3	153	76
Sprat	IIIa		1000	1000	100	100	34	3350	3350
Sprat	IIIbcd		2000	2000	100	50	0	0	0
Sprat	IVa-c,VIId		2000	2000	50	50	102	5103	5103
Turbot & Brill	IVa-c, VIId		200	200	25	25	5	132	132

* For these species the number of samples are estimated from the landings in 2001.

** For salmon the quota is given in numbers. As the mean weight for salmons is 5 kilo we have calculated one sample for each 20.000 landed Salmons.