COMMISSION REGULATION (EC) No 1639/2001 of 25 July 2001, 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) No 1543/2000

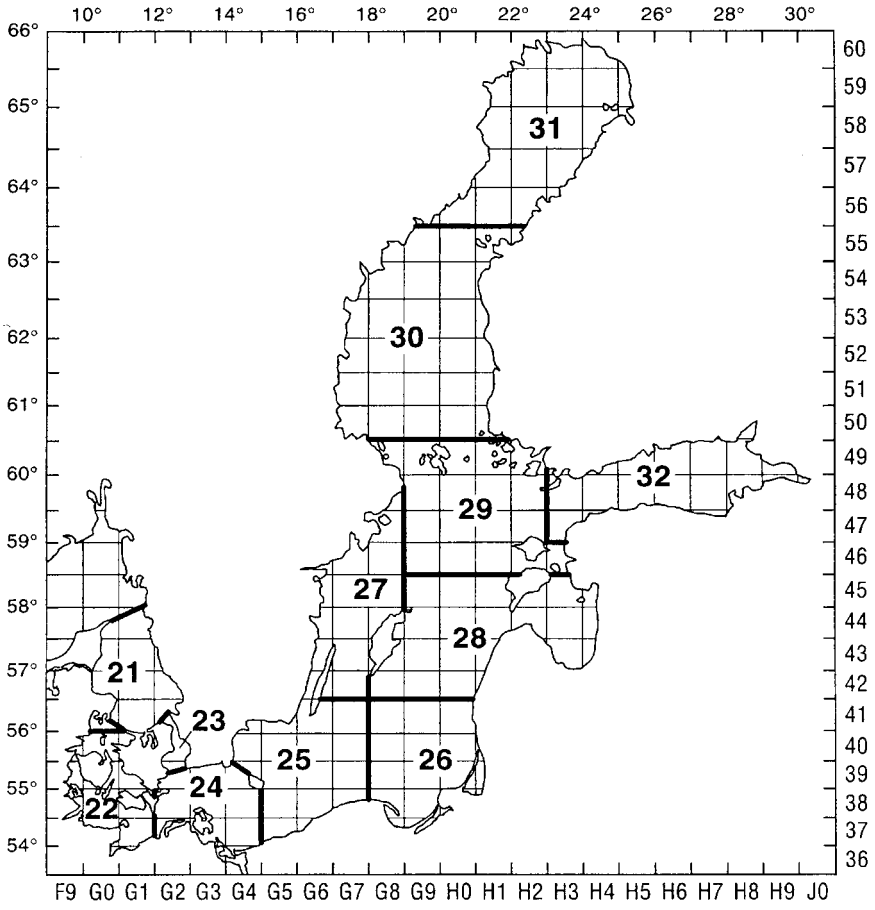
National Programme for 2005

31.5.2004

Ministry of Agriculture and Forestry

Finnish Game and Fisheries Research Institute

FINLAND



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CHAPTER I. CONTENTS AND METHODOLOGY

A. Contents of the Community programmes

1. Background information

In the member countries of European Union, the collection of primary fishery data to support common fishery policy has been a routine practice for a long time. Sampling programs have mainly targeted to parameters essential for fisheries management and advice. The information required for Community programme is defined within the framework of evaluation modules, covering on one hand fishing capacities and fishing effort, on the other hand catches, and finally, the economic situation of the fishery sector.

Both national and European Union advice on fisheries issues have been obtained from Advisory Committee on Fisheries Management of ICES. The evaluation of the state of the stocks and the advice given by ACFM has been based on analytical stock assessments. The primary data for scientific evaluations and assessments of the stocks have been obtained from national laboratories, and they usually contain fishery dependent and fishery independent information. Stock assessments have been made by international working groups under the umbrella of ICES.

2. Collection and management of the fisheries data needed to conduct the common fisheries policy

International Council for the Exploration of the Sea (ICES) has used earlier national databases when giving annual advice on fisheries management. Studies and evaluations on the state of fish stocks has concentrated to collect and use the following data:

- Landings according to stocks and assessment units
- Fishing effort according to areas, fishing fleets and various gears
- Age and length composition of landings and discarding in fishing harbours according to species
- Age and length composition of catches and discarding onboard fishing vessels according to species
- Research survey data

The main target is, however, that the minimum programme (MP) and extended programme (EP) contain all necessary elements to ensure solid and high quality stock assessments for fisheries management. Therefore in some occasions, the sampling intensity and number of samples proposed in our minimum programme (MP) deviate and usually exceed the intensity and number of samples proposed by the regulation random sampling design (Appendix XV).

3. Contents of minimum programme and extended programme

Sampling programme has been divided in two parts: Minimum programme (MP) and extended programme (EP). The minimum programme (MP) contains the following modules:

(1) Module of evaluation of inputs: fishing capacities and fishing effort

(2) Module of evaluation and of sampling of the catches and landings

(3) Module of evaluation of the economic situation of the sector

Extended programme (EP) contains modules mentioned above and in addition collection of information, which is listed in each of the modules separately. In the minimum programme, in each of the modules the spatial, temporal and precision levels of parameters are mentioned.

B. Precision levels and sampling intensities

1. Definitions of sampling precision levels and sampling intensities:

- When it is not possible to define quantitative targets for sampling programmes, neither in terms of precision levels, nor in terms of sample size, pilot surveys in the statistical sense should be established. Such pilot surveys must evaluate the importance of the problem and should also address the utility of more detailed surveys later on, and the cost-effectiveness relationship of such detailed surveys.
- When quantitative targets can be defined, they can be specified either directly by sample sizes or sampling rates, or by the definition of the levels of precision and of confidence to be achieved.
- When reference is made to a sample size or to a sampling rate in a population defined in statistical terms, the sampling strategies must be at least as efficient as Simple Random Sampling. Such sampling strategies must be described within the corresponding National Programmes.
- Member States can apply another sampling strategy than that corresponding to the basic stratification with simple random sampling (SRS) within strata and other sampling intensities than those defined in advance providing this alternative approach achieves the same or a higher precision level at the same or at a lower cost.

2. Distinction of precision/confidence levels

Level 1: Level making it possible to estimate a parameter with a precision of ± 25% for a 95% confidence level.

Level 2: Level making it possible to estimate a parameter with a precision of ± 10% for a 95% confidence level;

Level 3: Level making it possible to estimate a parameter with a precision of ± 5% for a 95% confidence level.

For Baltic herring and sprat the sampling intensity and level of precision has been set to “Level 2” for biological parameters. Our preliminary estimates show that this level (± 10% for a 95% confidence level) has been reached in 2003 sampling and we will continue that practice in current year and in incoming years. We will take into account the recommendations made by WKSCMFD in our future work.

The WKSCMFD in February 2004 in Nantes, France, was the first workshop dealing with the problem of precision related to the numerous biological parameters collected within the Regulation (EC) N°1639/2001 at the scale of Europe and for any stocks where information is collected. It was noted that in this context a large number of unresolved issues still remain. Among other things, stratification and statistical methods used by national programmes have not been completely addressed such as sampling design and full description of what an exploratory analysis should be.

It is not yet totally clear how the precision requirement of regulation applies to an inherently multidimensional variable, such as catch-at-age. It seems reasonable to assume that the requirement needs to apply to each age group separately, but mutual dependencies between estimates might complicate the matter. However, most of our primary data collection programmes use stratified sampling techniques, primarily by stock but additionally by fleet, gear, quarter, area, etc. It is obvious that precision levels can be then calculated for each stratum (e.g. each country), but it is the precision of the aggregate of all strata in relation to the stock indicators that is of ultimate interest, is not totally clear. Thus, to analyse the primary data is still ongoing process and our aim is to have, knowing that there is no recipe, no simple guideline to estimate precision for all stocks and everywhere, have our precision estimates during 2004 and first of all at a stock level and our aim is to check the calculation at a stock level in 2005.

CHAPTER II. MODULE OF EVALUATION OF INPUTS: FISHING CAPACITIES AND FISHING EFFORT

Fishing capacity and fishing effort describe the total capacity, and the volume and capacity of different fishing techniques as well as operation amounts of different fishing techniques.

Finnish Fishing Fleet

In the beginning of 2004, the Finnish fishing fleet numbered about 3 500 registered vessels. Most of the vessels (3 300) were under 12 meter (LOA), and they were used in coastal fishing. The overall capacity of the vessels in the beginning of 2004 was 19 400 GT and power 188 thousand kW. There has been some reduction in fleet size during the last years.

The fleet is divided into four segments: pelagic trawlers (163 vessels), demersal trawlers (3) and vessels with passive gears (57), that use nets and lines The remaining vessels belong to a segment of small scale coastal fishing vessels under 12 meter.

A big part of the vessels are used seasonally only. One should keep in mind too, that depending on the winter and latitude, the coastal waters in Finland are ice covered over many months, and fishing vessels are not in use. Regardless that, fishing can be conducted under ice cover. Then fishing vessels can be replaced for instance by snow vehicles.

C. Collection of data concerning fishing capacities

1. Minimum programme

Data

The number of vessels according to segments is available in fishing vessel register. Information is collected from all vessels included into the MAGP IV programme. Following information is available in fishing vessel register that consists of all vessels used in commercial marine fishing irrespective of the vessel length:

- Tonnage in gross tonnage (GT).
- The continuous maximum output of main engine (kW) according to regulation 2930/86 independently of possible delimitation of the main engine output.
- Age of the vessel

Classification of the data on fishing fleet

- The size distribution of the vessels and gears in use will be classified according table C.1.1 in order to be able to specify segments.

Reliability

- Information defined in regulation 2090/98 will be collected completely.
- The maintenance and continuous update of the register is allocated to the Fishery Units of the Employment and Economic Development Centres (EEDCs). The changes and updates of the fishing fleet register are sent to European Commission in timely fashion for their own register maintenance and update. Information on fishing capacity will be collected according to table C.1.1 classification.

Table C.1.1. Classification of fishing capacity

Vessel length		< 12 m	12 - < 24 m	24 - < 40 m
Type of fishing technique				
Mobile gears	Pelagic trawlers			
	Demersal trawlers			
Passive gears	Drift nets and -lines			
	Fixed gears			

2. Extended programme

None.

D. Collection of data related to fishing effort

1. Minimum programme

1.1 Fuel consumption

Data

The information on consumption of fuel and fuel costs are obtained from National Board of Customs and their fuel tax register. The segmentation is as shown in table C.1.1. All fishermen having more than 30 % of their income from fishing (commercial fishermen in class 1) are included into the refunding system of fuel taxation. The register of fuel taxation is maintained by regional customs districts and the register of commercial fishermen is maintained by Fishery Units of the Employment and Economic Development Centres (EEDCs). Information on fuel consumption rates will be combined with the economic data (see section J.1).

Finnish Game and Fisheries Research Institute has made an arrangement with National Board of Customs of getting access to the register of fuel taxation. Coverage and reliability of the data are not known. Fuel costs will be estimated on the basis of special survey based on fuel taxation information and economic information of the fishing firms (see also J.1).

Time scale and delay

As it is stated in the regulation, fuel consumption is considered as a part of the economic evaluation, and so it is assumed that the data on fuel consumption will be ready by the end of the year following the referred year.

1.2 Fishing effort

Data

Fishing effort data for minimum programme will be obtained besides the collection of catch data (see E.1.1). Target population of fishing effort data consists of all the vessels that are used in commercial fishing and, of all professional fishermen, who have a personal reporting obligation. Fishing effort will be collected by fishing occasion-based reports (logbooks) and so called coastal fishery reports. Fishing effort will be collected according to categorisation corresponding to the regulation.

Exceptions

For small-scale coastal fishing (vessels of under 10 meter) fishing effort can be calculated by gear, not by vessel. Therefore fishing effort can be presented only by fishing days not multiplied by tonnage. It should be noted that the tonnage of vessels would not necessary correlate with fishing effort of fixed gears at all, for example if fixed nets are kept under ice cover in winter fishing. Then fishing is not carried out by a fishing vessel at all.

Reliability

Required precision and confidence levels of the data can be achieved.

Time scale and delay

Preliminary data will be available in January-March 2005. Final data referring to the year 2004 will be available by June 2005.

2. Extended programme

None.

CHAPTER III. MODULE OF EVALUATION OF THE CATCHES AND LANDINGS

E. Collection of data related to catches and landings

Measures of total catch and the share of landings

The total fish catch level in Finland has been 120-160,000 tons in the previous years. In 2003 commercial marine catch was about 80,000 tons. The bulk of the catch consisted of Baltic herring, 65,000 tons, followed by sprat, 9,000 tons. Commercial catch in inland waters was 5,000 tons in 2002. Half of that consisted of vendace. Total catch of recreational fishermen in 2002 was 39,000 tons, of which 8,000 tons was caught in the Baltic Sea and the rest in the inland waters.

1. Minimum programme

1.1 Commercial fishing

Data

Target population of catch and landings data for minimum programme consists principally of all the vessels used in commercial fishing and, of all the fishermen who have a personal reporting obligation. Catches and landings will be reported according to regulation.

Catches and landings of vessels over 10 meters will be collected by fishing occasion-based reports (logbooks). Catches and landings of vessels under 10 meters (so called coastal fishery) will be collected by monthly reports. In addition, catches and landings of salmon in coastal fishery will be collected by fishing occasion-based reports. The landings of Finnish vessels abroad, as well as foreign vessel landings to Finnish ports are surveyed by logbooks, landings declarations and sales notes, and by the crosschecking of the different data. There is a data exchange between the relevant foreign authorities, which in the case of Finland means Sweden and Denmark.

Principally discards data is available in the logbooks/landings declarations (landings (net catch) + discards = catch (gross catch)). The discard sampling is explained in the next chapter (1.2).

Reliability

Reliability conditions will be met in general.

Time scale and delay

Yearly data on cathes and landings will be available during the 3rd quarter of the year that follows the referred statistical year. Preliminary data for the fish stock assessment is available in the 1st quarter.

Costs

All costs comprise of personnel and travelling costs.

1.2 Discards sampling

There are five species in the Finnish catch that are included in the list of stocks for landings and discards monitoring (MP, Commission Regulation No 1639/2001): herring, sprat, cod, salmon and sea trout. Norway lobster that does not live in the Baltic Sea is thus not caught by the Finnish vessels, and this also applies to plaice that is found in the ICES area IIIb-d, but not in the northern Baltic Sea.

Table E.1.2.1 summarizes the activities with discard sampling dealing with the Finnish National Programme 2005.

Table E.1.2.1. Overview of activities dealing with discard sampling in Finnish NP 2005

Species	Actions in NP 2005	Basis for actions	STECF-SGRN
Baltic herring and sprat	Derogation applied	Catch used either for human consumption or for animal fodder	Agreed with NP's 2003-2004
Cod	Derogation applied	Pilot study carried out in NP 2003 showed discards to be negligible	Agreed with NP 2004
Salmon and sea trout	Pilot study continued	Estimation for harmed undersized salmon and sea trout in long line fishery by field survey	Agreed with NP 2004

Baltic herring and sprat

According to the catch statistics, the Finnish catch of Baltic herring in 2003 was 64 500 tons and, as reported by the fishermen, total discards of herring 58 tons (0,09%). Of these herring discards, 44 tons (75%) were reported as seal eaten (pound net catch, Finnish Game and Fisheries Research Institute 2003). The total sprat discards in 2003 was 1 ton, corresponding to 0,01% of the total Finnish sprat catch. Excluding the catches damaged by seals, all herring and sprat are valuable to the fishermen and are sold either for human consumption or for fodder markets. Because of this, no separate discard sampling is needed for Baltic herring and sprat.

Cod

Finnish vessels use log-books that include separately the landings and discards. The Finnish reported catches of cod in 2002 was 1044 tons, and according to the reports by the fishermen, the discards were negligible (reported less than 1 ton). In the NP, Finnish authorities requested derogation for sampling discards of cod. The reason for this request was that Finnish vessels operate in the southern part of the Baltic Sea, and landings take place in Sweden and Denmark. It would thus be both difficult and expensive to organise the sampling using Finnish observers. Furthermore, cod catch sampling from similar gill-net and trawl fisheries is annually organized by Danish and Swedish institutions in ICES Sub-divisions 24-27 in their fishing zone. Data from these fisheries most likely represent reasonably well also the Finnish cod fishery.

As a reasonable solution to this problem, STECF recommended a pilot study to be performed in cooperation with neighbouring countries for comparison of cod discards estimates. In 2003, such a comparison has been done as a pilot study as suggested by the STECF. The pilot study in 2003 contained analysis of the existing primary data of discarding practice in the southern Baltic in 2001-2002 in ICES Sub-divisions 25-28, where the main body of the Finnish cod catches are taken. In cooperation with Danish and Swedish scientist, an ad hoc group met and compiled information on catch composition and amount of discards. The effect of discarding in Finnish cod fisheries and fleets have been evaluated and shown to be negligible.

Pilot study of discards of salmon and sea trout

Finnish commercial salmon catch is mainly caught by trap nets and gillnets each gear having about half of the total commercial catch. Long line catches constitute less than 10% of the total catch (4% in 2003). Driftnets do not practically catch any undersized salmon. Trap nets do catch undersized salmon, but in these gear fish can be released unharmed. Long lines catch occasionally significant amounts of young salmon. According to catch statistics, the proportions of the undersized salmon vary between 5-20% in annual long.line catches. A part of these fish can be released unharmed. However, the survival of these fish has not been estimated. At present the discards of long-line fishery have a insignificant role in the total discards, but proactive studies are justified because long-line fishery is expected to increase along with the gradual implementation of the ban of drift-net fisheries. The commercial sea trout catch is less than 20% of salmon catch; 2/3 of it is caught with gillnets and 1/3 with trap nets.

Finnish logbooks contain information on discarded salmon and sea trout. According to quantitative logbook entries, discards constituted about 15% of the total commercial catches in year 2003. About 97% of the reported discards have been caused by seal damages. However, these data contain a lot of qualitative notifications because seals often tear up fish so badly that fishermen have not been able to quantify them. It has been considered that actual amount of discards caused by seals may be 20-30 % the recorded.

The pilot study regarding salmon and sea trout discards that was recommended by the STECF-SGRN, was carried out in 2003 (Ref. Report of Discards and Discarding Practices in Finnish Fisheries in 2001 and 2002). The results indicated a need to carry out a field study to estimate the quantity of killingly harmed undersized salmon and sea trout in different gears, particularly in long lines. A pilot field survey will be started in the long line fisheries in 2004. In year 2003 there were only a very few Finnish vessels fishing with long lines, and their effort and catches were low. At the present situation where the trade and fishery of the Baltic salmon is strongly restricted due to high dioxin content of the fish, and it is difficult to predict in which extension the long line fishing will be manifested in the upcoming season. It is highly probable not to attain adequate amount of data for the estimation in one season, and therefore the pilot study will be continue in 2005. On the basis of the experience from the year 2004 study the approach will be revaluated and the plan will be adjusted accordingly. In survey the observed damages among released undersized salmon will be classified according to degree of harm and the number of cases in each class will be recorded. The criteria for classification will be based on ocular definable quantities. The estimate for proportion of salmon died in the hook or killingly damaged in release from the hook will be obtained. Among the less harmed fish neither survival nor physiological condition will be explored. In order to evaluate the need of such studies the data on proportions of less harmed salmon are needed first.

Costs included in FinForms MP.xls, Worksheet E. Discards.

1.3 Recreational fishing

Data

The collection of the data of recreational salmon catches in the Baltic Sea is planned on the basis of the results of a pilot study in 2003. A survey for the year 2004 will be conducted in 2005.

The process of collecting the catches of recreational fishing will start in the end of 2004 by planning and preparatory work of the survey. This includes commissioning the frame register and designing and extracting the sample.

Target population of the survey will be all the households in Finland. The sample design is stratified sampling. Contact will be made three times in the first half of 2005. For those who did not respond to the postal questionnaire, a special post-sampling will be conducted by a telephone interview (a survey for the non-respondents).

Reliability

The results of the pilot study proved that, the accuracy of the estimates will increase, while the sample size gets larger. On the other hand, the marginal benefit will degrease while increasing the sample size. Salmon is caught by relatively very few fishermen, and in addition, the variation of these dense catches is relatively high. Because of these facts, the confidence interval of salmon catch estimates is always quite wide, even in the case of large sample sizes (sample size several thousands).

The post-sampling for non-respondents helps to correct the bias resulting from the differences between respondents and non-respondents. If the bias is not taken account, the catch and number of fishermen would be overestimated.

Time scale

The data will be available by the end of the year 2005.

Costs

The costs include subcontracting of the survey and personnel costs of making the estimations.

2. Extended programme

2.1 Salmon catches in rivers

The annual scientific advise of ICES on the management of Baltic salmon fishery is based on stock assessment by state-space modelling of the salmon life cycle. Essential inputs of the abundance estimation are salmon catches and fishing effort on the whole distribution area of salmon. Riverine salmon catches and salmon fishing effort are especially important for estimating abundance of future

recruitment, i.e. the ultimate interest of typical salmon stock assessment made for management purposes.

Data concerning recreational catches of salmon in rivers will be collected using postal fishing questionnaires. Questionnaires will be carried out in two rivers with original wild salmon stocks (Rivers Tornionjoki and Simojoki) and in three rivers, where salmon is being reintroduced, following the international Salmon Action Plan (Rivers Kiiminkijoki, Kuivajoki and Pyhäjoki). In Finland, only in these five rivers have significant production of wild salmon, or potential to it. Information on river catches is invaluable when estimating the number of spawners entering these rivers annually, and when planning fisheries management actions needed to safeguard and enhance the stocks of wild salmon.

The samples for the fishing questionnaires will be drawn from the local registers on recreational fishermen. The compiled registers will cover at least 90% of all licensed fishing in each river. For Tornionjoki and Simojoki, the compiled registers will then be sampled (using SRS) at a rate making it possible to estimate salmon catches at level 1 precision (a precision of ± 25% for a 95% confidence level). In the Rivers Kiiminkijoki, Kuivajoki and Pyhäjoki, the target is the precision of + 30-40% for a 95% confidence level. Because of the very low catches, a level 1 precision would in these rivers require 100% sampling which, due to the high costs, is not reasonable. To get a better view from the salmon catch of the restocked salmon populations in the rivers Kiiminkijoki, Kuivajoki and Pyhäjoki, the fishing questionnaires have been widened to the estuaries of these rivers.

- River Tornionjoki: the compiled registers will include 5,000 – 10,000 recreational fishermen, covering 100% of all licensed fishing on the Finnish side of the river. Sampling rate 1:4.
- River Simojoki: ca. 3000 fishermen, covering 100% of licensed fishing in the river. Sampling rate 1:4.
- River Pyhäjoki: ca. 1,300 fishermen, covering 100 % of licensed fishing along river and river mouth area at sea. Sampling rate 1:2.
- River Kiiminkijoki: ca. 2,500 fishermen, covering 100 % of licensed fishing along river and river mouth area at sea. Sampling rate 1:3.
- River Kuivajoki: ca. 200 fishermen, covering 100 % of licensed fishing along river and river mouth area at sea. Sampling rate 1:1.

Costs included in FinForms EP.xls, Worksheet E. Recr Fish.

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

1. Minimum programme

In Finnish fisheries CPUE data is obtained from the log-books and coastal fishery records. For stock assessments, CPUE is usually calculated according to effective fishing time of the gear, and weighting by engine power is normally not used in the Baltic Sea area as proposed in Annex, Chapter III in Council regulation.

The Finnish commercial fishing effort and catch per unit of effort (CPUE) data are regularly used in some stock assessments. Finnish CPUE data has been used in assessments for two Baltic herring stocks (SD 30 and 31 stock) and for two Baltic salmon stocks (SD 22-31 and SD 32 stock).

We are sampling presently 13 fleets within the national programme for 2002-2006, which are used for stock assessments. These CPUE data series are used for tuning the assessments of Baltic herring and as an input data of Baltic salmon life history model (mainly efforts). The uses of commercial CPUE data for the stock assessments are following:

Baltic herring

Stock assessment of Baltic herring in the Bothnian Sea (Sub-division 30) is based on catches, catch composition and information of fishing effort and Finnish CPUE information on pelagic single- and pair trawling, demersal trawling and trap net fishery. When calculating and estimating total fishing effort by trawl gears, the increase in trawl size since 1980 as well as changes in catchability has been taken into account by using a correction coefficient for effort data in herring trawl fishery. The annual

correction coefficient is derived using a model, which estimates the average size of fishing circle of trawl. *(Rahikainen, M. and Kuikka, S. 2002. Fleet dynamics of herring trawlers—change in gear size and implications for interpretation of catch per unit effort. Can. J. Fish. Aquat. Sci. 59: 531-541).* In most recent years about 3 % increase in effort has been taken into account in catchability.

In the Bothnian Bay (ICES Sub-division 31) we use total effort and CPUE data from pelagic trawling, demersal trawling and trap net fishery for stock assessment. In the Bothnian Bay area there has not been substantial changes in trawl size as in ICES Sub-division 30.

In the northern Baltic Proper (ICES Sub-divisions 28, 29 and 32; new assessment unit, stock assessed in ICES 2001) Finnish CPUE and effort data from trawl fisheries was used to estimate the dynamics of the stock.

In the Baltic Main Basin, Archipelago Sea and Gulf of Finland herring stock (ICES Sub-divisions 25-29 and 32 excluding Gulf of Riga) the assessment is mainly based on hydroacoustic survey indices, total catches and catch compositions. The stock is composed of large number of stocks/populations that have been identified on biological grounds.

Sprat

In the Baltic, there is one sprat assessment unit (ICES Sub-divisions 22-32). The main body of Finnish sprat catches come from mixed trawl fishery for herring and sprat. However, in sprat stock assessment fishery information is not used at all, and assessment is totally dependent on international hydroacoustic surveys. .

Cod

In addition to research survey data, effort and CPUE data from Danish commercial fisheries are used to assess the western Baltic cod stock (ICES Sub-divisions 22-24). Fishery information originates from trawl-, gillnet and Danish seine fisheries.

In the stock assessment of the eastern Baltic cod stock (ICES Sub-divisions 25-32) we do not use presently effort and CPUE data from commercial fishery. The basic information for tuning assessment is from BITS surveys from the first quarter. In 1997 International Baltic Sea Fishery Commission (IBSFC) Sub-group tried to standardize fishing effort and catch per unit of effort information for period 1994-1996 for stock assessment purposes. The results showed that the precision of the information was not adequate and since 1997 fishery information has not been used in stock evaluations.

Salmon

For the assessment of Baltic salmon stock complex (ICES Sub-divisions 22-29, 30, 31 and 32), information on commercial fishery (catches, total effort by gears and CPUE) is collected annually. In addition the tagging data is used to estimate the fisheries specific catchability across the Baltic Sea. This information is included into the report of Working Group of Baltic Salmon Assessment. Time series covers at the moment years 1969-2003. Information on commercial fishery is, however used only in short-term predictions of the stock complex and to describe the development of fishery in recent years.

2. Extended programme

None.

G. Scientific evaluation surveys of stocks

1. Minimum programme

1.1 BITS survey

According to the spirit of Council regulation (Appendix XIV), Finnish scientists will participate and cooperate BITS 1st and/or 4th quarter surveys in Baltic Sea area IIIb-c for Baltic cod and other demersal species. This is useful and very practical and it is continuation of the cooperation between Danish and Swedish institutions and research activities established in 1983.

Costs included in FinForms MP.xls, Worksheet G. Surveys 1.1

1.2 Usage of commercial CPUE data instead of acoustic surveys of Baltic herring and sprat

Instead of yearly acoustic surveys for herring, Finland has successfully improved the usage of available commercial CPUE information. With the concurrent improvements in sampling methods, the quality of the herring stock assessments has raised *(ICES Coop.Res.Rep.No.242. Report of the ICES Advisory Committee on Fishery Management, 2000, part* 3).

As described in detail in section F, Finnish commercial fishing effort and catch per unit of effort (CPUE) data has been regularly used in assessments for two Baltic herring stocks: herring stock in SD 30 and herring stock in SD *31 (e.g. Report of the Baltic Fisheries Assessment Working Group; ICES CM 2004/ACFM:22)*. In 2001 Finnish CPUE data was also used for Baltic herring assessment unit in SD's 28, 29 and 32 *(Report of the Baltic Fisheries Assessment Working Group; ICES CM 2001/ ACFM:18)*. Since year 2000, the CPUE-tuned XSA-assessment of the main herring stock in Gulf of Bothnia (herring stock in SD 30, Bothnian Sea) has been accepted by ACFM *(reports of ICES ACFM 2000-2004).*

1.3 Salmon survey in River Simojoki

The International Baltic Sea Fisheries Commission (IBSFC) has adopted long-term management goals for the Baltic salmon fisheries, the so-called Salmon Action Plan (SAP). The most important operational management objective is to gradually increase the natural smolt production of wild Baltic salmon to attain at least 50 % of the natural production capacity of every individual river before the year 2010 (http://www.ibsfc.org). To evaluate the achievement of this goal two type of information are needed:

- The smolt production capacity of each Baltic river
- The current smolt production of each Baltic river

This information plays a crucial role in the assessment of Baltic salmon, as a basis of stock projections and management advise.

The need of the information above calls for direct measurements of juvenile production and collection of stock-recruit data by establishing so-called index rivers, which has been widely and repeatedly suggested for Baltic (Appendix 2). A set of regional index rivers with direct measurements of the number of spawners and the resulting smolt production, together with monitoring of parr densities in all the Baltic rivers would provide the most cost-effective, reasonably precise means to provide the data necessary for assessment model, allowing for the follow up of the compliance with the managements objective. Parr densities surveyed by electrofishing can be related to the realised smolt production in the index rivers and this relation can be further used to assess smolt production in other rivers than index rivers (Appendix 2). It is important to notice, that data collection costs depend very much on the size of the river and also, whether the river in question is an index river or not. The northern Baltic rivers located in Finland and Sweden are much larger than the salmon rivers in the middle and southern Baltic. Thus, costs for data collection per river (and per nation) are clearly highest in the northern Baltic.

There are two wild Baltic salmon rivers in Finland: the Rivers Simojoki and Tornionjoki. The latter one flows along the border of Finland and Sweden, and the monitoring of the Tornionjoki salmon stock is organised in cooperation with Sweden. Both of the rivers are chosen by the IBSFC's Salmon Action Plan (SAP) as index rivers, where monitoring is recommended to include electrofishing and counts of spawners and smolts. Data collection in the Tornionjoki is not included in the Finnish NP2005, as the question of how to coordinate monitoring under the EU data collection programme has not yet been discussed and agreed between Finland and Sweden.

Preconditions exist for successful smolt trapping (partial trapping with mark-recapture) and electrofishing in the Simojoki, as these data collection has already been established. In 2003, a pilot study was carried out by national funding to count the spawning run in the Simojoki by a horizontal split-beam echo sounding. The study revealed promising results, thus data collection by echo sounding is included in the NP2005.

The planned volume of salmon juvenile monitoring (smolt trapping and eletrofishing) in the Simojoki follows earlier years' monitoring, with about 30 electrofishing sites and the setup of 2 smolt traps (the second trap is preferred for marking in mark-recapture trials). The counting of spawners by echo sounding consists of a set-up of two transducers (one on each bank), weirs guiding salmon to pass the site at appropriate range from the transducers, data collection and post-processing of data

(identification and counting of fish traces). Expansion of the counts by a statistical treatment of the data is needed to cover unsampled periods of time/unsampled parts of the river transect.

Depending on the annual variation in the river conditions (the most critical variable being discharge), occurrence of extraordinary conditions may lead to occasional failure of some data collection. On average, this happens on 15%-25% of the occasions.

Survey data are stored on data bases for further reporting in conjunction with national and international (ICES WGBAST) stock assessment. Surveys are conducted in coordination with other Baltic countries with wild salmon rivers.

Costs included in FinForms MP.xls, Worksheet G. Surveys 1.3

2. Extended programme

2.1 Surveys of potential salmon rivers

Another agreed management objective of the Baltic Salmon Action Plan is that wild salmon populations shall be re-established in potential salmon rivers. This objective calls for collection of data on reproduction success of salmon in the rivers, where actions aiming at re-establishment of salmon population are taking place (Appendix 2).

There are three Baltic rivers in Finland, which are nationally selected for attempts to re-establish wild salmon stocks: the Rivers Kuivajoki, Kiiminkijoki and Pyhäjoki. Re-establishment efforts include stocking of salmon juveniles, habitat restoration/improvement, water quality improvements and management of fisheries. Monitoring of parr densities by electrofishing is suggested here in these rivers. The volume of sampling is related to the size of the rivers so that the relative intensity of sampling is roughly similar to the sampling carried out in the wild salmon rivers (see previous section).

Depending on the annual variation in the river conditions (the most critical variable being discharge), occurrence of extraordinary conditions may lead to occasional failure of some data collection. On average, this happens on 15%-25% of the occasions.

Survey data are stored on data bases for further reporting in conjunction with national and international (ICES WGBAST) stock assessment. Surveys are conducted in coordination with other Baltic countries.

Costs included in FinForms EP.xls, Worksheet G. Surveys 2.1

H. Biological sampling of catches: composition by age and by length

1. Minimum programme

The total commercial catches of Baltic herring, sprat, cod, salmon, sea trout, flounder, whitefish, pike-perch and perch in Finnish fisheries in 1994-2003 are presented in Table H.1.1. The mean volume of commercial catches by species in years 2001-2003 is used as a basis for sampling for length distributions and age compositions of catches. Sampling of Baltic herring and sprat are based on length stratified sub-sampling scheme and simple random sampling is not applied. Sampling of salmon, sea trout and flounder as well as European whitefish, pike-perch and perch included in extended programme are based on Simple Random Sampling (SRS) design. Cod samples are not collected because of negligible catches in the Finnish fishing zone. In comparison to our sampling intensity and sampling design presented in chapters H.1-H.2, Table H.1.2 summarizes the numbers of samples and the number of individual fish to be processed according to regulation. These numbers are calculated according to recent catch rates for all those species, which are included either in our minimum programme and/or in extended programme.

Table H.1.1. Commercial catches (tonnes) by species in minimum programme (Baltic herring, sprat, cod, salmon, sea trout and flounder) and in extended programme (whitefish, pike-perch and perch) in 1994-2003

Species	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Mean 2001-2003
								Reference period			
MP											
Herring	97673	94612	93338	90334	85545	82237	80697	81916	75580	64508	**74001**
Sprat	497	4104	14351	19851	27014	18886	23134	15742	17245	8951	**13979**
Cod	520	1852	3132	1536	1034	1569	1817	1716	1044	1163	**1308**
Salmon	1049	1160	975	1051	720	720	591	444	441	355	**413**
Sea trout	116	128	152	141	122	103	113	92	72	58	**74**
Flounder	78	89	99	86	80	83	75	130	77	43	**83**
EP											
Whitefish	1104	1161	1280	1157	1425	1246	1176	882	811	822	**838**
Pike-perch	474	532	594	748	491	438	450	412	607	847	**622**
Perch	485	663	546	759	848	821	782	803	885	1095	**928**

Table H.1.2. Intensity of sampling by species according to Council Regulation: The number of length- and age samples (A) and total number of samples (B) in 2005 according to catch rates in 2001-2003 in commercial fishery.

A) The number of length and age samples and number of individuals according to catch rates stipulated by Council Regulation in minimum programme (MP) and extended programme (EP)

Species	Area	Catch samples				Length		Age	
		Length		Age		Number of samples per catch in tonnes		Number of individuals per catch in tonnes	
						MP	EP	MP	EP
		MP	EP	MP	EP	n/t	n/t	n/t	n/t
Herring	IIId	F2	E2	F2	E2	1/1000	1/500	100/1000	100/500
Sprat	IIIb-d	G2	F2	G3	F3	1/2000	1/1000	50/2000	50/1000
Salmon	IIIb-d	C3	B2	C3	B2	1/100	1/50	50/100	100/50
Sea trout	IIIb-d	C3	B2	C3	B2	1/100	1/50	50/100	100/50
Flounder	IIIb-d	D3	D3	D3	D3	1/200	1/200	50/200	50/200
Whitefish	IIId		C3		C3		1/100		50/100
Pike-perch	IIId		C3		C3		1/100		50/100
Perch	IIId		C3		C3		1/100		50/100

B) The number of samples and number of individuals in length distribution and age distribution sampling stipulated by Council Regulation in minimum programme (MP) and extended programme (EP)

Species	Catch 2001-2003	Length distributions				Age compositions			
		Number of samples		Length measurements		Number of samples		Age determinations	
		MP	EP	MP	EP	MP	EP	MP	EP
Herring	74001	74	148	7400	14800	74	148	7400	14800
Sprat	13979	14	28	700	1400	14	28	350	700
Salmon	413	4	8	200	800	4	8	200	800
Sea trout	74	1	2	50	200	1	2	50	200
Flounder	83	1	1	25	25	1	1	25	25
Whitefish	838	-	8	-	400	-	8	-	400
Pike-perch	622	-	6	-	300	-	6	-	300
Perch	928	-	9	-	450	-	9	-	450

Using the information in tables above and referring the necessary precision/confidence levels, we have modified the intensity of sampling by species as necessary. We have also adjusted the necessary number of samples according to our simple random sampling design or length stratified sub-sampling design so that the results will serve in the best way the scientific evaluations of the state of the stocks and improve the possibilities to manage the resources in a sustainable way. Detailed information by species is presented in following chapters.

1.1 Baltic herring and sprat

Baltic herring *(Clupea harengus membras)*

Finnish herring fishery in the Baltic Sea is conducted mainly in ICES Sub-divisions (SDs) 29-32.

In 2003 the total Finnish herring landings were 64 500 tonnes, comprising about 29 % of the total Baltic herring landings in the Baltic Sea. From the total catches, 65 % have been taken from SD 30 (Bothnian Sea), 18 % from SD 29 (Åland Sea and Archipelago Sea), 11 % from SD 32 (Gulf of Finland) and 5 % from SD 31 (Bothnian Bay). More than 86 % of the catches were taken by pelagic- and demersal trawl fisheries and 13 % from trap-nets during spawning time.

Finnish herring fishery is exploiting mainly three different Baltic herring stocks (assessment units): Baltic herring stock in SD 30 (Bothnian Sea), Baltic herring stock in SD 31 (Bothnian Bay) and Baltic herring stock in SDs 25-29, 32 in the Baltic main Basin and Gulf of Finland.

Because all the main fisheries (pelagic trawls, demersal trawls and trap-nets) have different exploitation patterns and are used as separate fleets in stock evaluations, they also need to be sampled separately.

Instead of following Council Regulation sampling scheme, the primary requirement in Finnish herring sampling is to properly cover all the strata (3 stocks, 3 fleets and 4 year-quarters) in order to meet the assessment-criteria.

Since the study projects funded by DG XIV (International Baltic Sea Sampling Programs I & II) in 1998-2001, we have used length stratified sub-sampling scheme to estimate age compositions of Baltic herring. This sampling scheme is designed to support the development of international databases and standardized methodologies in data processing.

The advantage of this kind of sampling scheme is that it is rather fast to collect length distributions and there is no need to make as much age readings as in simple random sampling, which is more costly and time consuming. The results are, however, comparable and the quality and accuracy is similar.. The sampling scheme presented in Table H.1.1.1 for 2005, is corresponding better to our minimum requirements, and it is our minimum programme. This kind of sampling scheme has been in force since 1998 and will be implemented also in 2005. Sampling frequency will be modified during fishing season, depending on ice coverage, TAC, spatial and temporal fishing restrictions, catch rates and fishing activities.

The following text table shows 2001-2003 average catch rates regionally, number of samples required by regulation, planned number of samples according to data requirements and corresponding number of length measurements. The reference year for number of age readings (40 per length interval per year) is 2003.

Baltic herring

ICES Sub-divisions	**SD 29**	**SD 30**	**SD 31**	**SD 32**	**Total**
Average catch rates in 2001-2003 (tons):	**13 300**	**48 400**	**3 400**	**8 500**	**74 000**
Number of samples required by regulation	**13**	**48**	**3**	**9**	**74**
Number of samples (planned):	**32**	**50**	**28**	**32**	**142**
Length measurements:	**15200**	**23750**	**13300**	**15200**	**67450**
Age determinations (as in 2003; implementation 2005 is dependent on existing future length-classes):	**1000**	**1570**	**920**	**800**	**4290**

Baltic herring samples are collected mainly in fishing harbours and, if necessary, also onboard commercial fishing vessels. In sampling scheme we have taken into account the annual life cycle of

Baltic herring and the presence of the ice coverage during the winter in the northern Baltic. Because of these conditions, all three fishing gears are not in use in all year quarters. Trap net fishery is conducted only in quarter 2 and 3, and in the Bothnian Bay fishing season covers 3 quarters.

Taking into account the exceptions for ICES Sub-division 31 and trap-net fisheries, the 2005 sampling plan is roughly based on the average catches of 2001-2003 in different regions and fisheries. Moreover, the sampling intensity in general is locally adjusted during the year according to temporal and regional changes in fisheries. The seasonal herring fishing intensity in each area is predominantly dependent on the TAC, which causes fishing restrictions in certain fisheries and/or seasons, as in 2002-2004, and may therefore influence the sampling intensity from the planned.

According to assumed catches by ICES Sub-divisions, gears in use, fishing intensity and taking into account, regardless of the amount of catches, a minimum coverage requirement of one sample by fishery per month (or a minimum of 3 samples by fishery per quarter), the total number of samples in 2005 are as in Table H.1.1.1 The sampling covers three stocks, which are distributed in two management units and included into the assessment units as follows:

- Assessment unit ICES Sub-divisions 25-29 and 32 (also 28, 29 & 32 separately; not assessed in 2003-2004)
- Assessment unit ICES Sub-division 30
- Assessment unit ICES Sub-division 31

No separate discard sampling is regarded to be needed for Baltic herring, see E.1.2.

Costs included in FinForms MP.xls, Worksheet H. A&L Land.

Table H.1.1.1. Total number of Baltic herring samples according to area, year quarter and fleet in 2005 weighted by average catch rates in 2001-2003 and taking into account the minimum coverage requirement for each stratum.

	Year	ICES Sub-division				
Fleet	**quarter**	**29**	**30**	**31**	**32**	**Fleet / year quarter**
	1	0	0	0	0	0
Trap-	**2**	3	3	3	3	12
net	**3**	3	3	3	3	12
	4	0	0	0	0	0
	Fleet / SD total:	**6**	**6**	**6**	**6**	**24**
	1	3	4	0	3	10
Demersal	**2**	4	6	4	4	18
trawl	**3**	3	6	4	3	16
	4	3	6	3	3	15
	Fleet / SD total:	**13**	**22**	**11**	**13**	**59**
	1	3	4	0	3	10
Pelagic	**2**	4	6	4	4	18
trawl	**3**	3	6	4	3	16
	4	3	6	3	3	15
	Fleet / SD total:	**13**	**22**	**11**	**13**	**59**
	GRAND TOTAL	**32**	**50**	**28**	**32**	**142**

Age determination procedure using otolith thin slices

The age determination of Baltic herring and sprat has traditionally been carried out reading whole otolith samples. However, this has created problems in the reliability of the age determinations, since the otoliths of herring from northern Baltic are difficult to interpret with the traditional methods. The number of annual rings detected from whole otolith is not reliable in case of such slow growing fish as herring in the northern Baltic Sea. On the other hand, from whole otolith false rings can easily be interpreted as real annuli. A significantly more accurate method, developed in the UK, in which the age is determined from stained otolith thin slices, has been taken into use in the Finnish Game and Fisheries Research Institute. The otoliths are embedded in epoxy blocks and sawed with precision cutter into 0,4 mm thin slices, which are stained with neutral red solution. The making of the otolith

thin cut preparations is contracted out to a trained subcontractor, and the staff of the FGFRI conducts the age readings microscopically. New technology will provide more accurate age determinations, and in addition, the aim is to speed up the determinations and improve the age determination economy as a whole.

Concerning the calibration of age determinations, a workshop on age reading on herring will take place in Finland, Seili Biological station on 8–10 June, 2005. In the workshop, the readers compare their interpretations in age reading and different preparation methods of otoliths.

Costs included in FinForms MP.xls, Worksheet H. A&L Land

Sprat *(Sprattus sprattus)*

The total catch of sprat in 2003 in the whole Baltic Sea was about 308 000 tonnes. Finnish sprat catch totalled 8 950 tonnes in 2003, and it was about 3 % of the total catches. Finnish sprat catches are taken entirely by trawl fisheries (pelagic trawls and demersal trawls). The main body of Finnish sprat catches is taken in the northern parts of the Baltic Main Basin, southern parts of the Bothnian Sea and in the Gulf of Finland. The distribution of catches in 2003 were: In the Gulf of Finland (ICES Sub-division 32) 23 %, Åland Sea and Archipelago Sea (ICES Sub-division 29) 52 % and in the Bothnian Sea (ICES Sub-division 30) 17 % of the total catches. In 2003, 9 % of the Finnish sprat catches were taken from Baltic Main Basin or Southern Baltic (Sub-divisions 24-28) and landed outside Finland.

Sprat sampling is carried out in Finnish fishing harbours together with Baltic herring sampling from herring trawl fishery and mixed trawl fishery for herring and sprat. Whenever sprat is present in these samples, the share of sprat in catches is estimated, and if the number of individuals is sufficient for defining length distributions, length measurements are carried out. However, in length-stratified sampling for quarterly compiled age-length-keys, a sufficient temporal and length-class coverage has to be ensured.

Sampling intensity in 2005 is planned to cover various year quarters, relevant areas and gears.

The text table below shows our length-stratified sampling practice of sprat from ICES Sub-divisions off the Finnish coast in reference year 2002

Sprat samples in 2002

ICES Sub-divisions	SD 29	SD 30	SD 32	Total
Number of samples required by regulation:	2	1	1	4
Number of samples planned	24	24	24	72
Length measurement:	6600	6600	6600	19800
Age determinations as in 2003:	450	620	480	1550

In 2005 our intention is to collect about 72 samples to cover all the strata. Depending on trawl fishing activities and the abundance of sprat in the catches, the sampling intensity will be modified during the fishing season. The sampling scheme presented in Table H.1.1.2 for 2004 corresponds to our minimum requirements and is our minimum programme.

No separate discard sampling is regarded to be needed for sprat, see E.1.2.

Costs included in FinForms MP.xls, Worksheet H. A&L Land

Table H.1.1.2. The distribution of sprat samples to areas, year quarters and fleets, planned for 2005.

Fleet	Year quarter	ICES Sub-division 29	30	32	Fleet /year quarter
	1	3	3	3	9
Demersal	**2**	3	3	3	9
trawl	**3**	3	3	3	9
	4	3	3	3	9
	Fleet /SD total:	**12**	**12**	**12**	**36**
	1	3	3	3	9
Pelagic	**2**	3	3	3	9
trawl	**3**	3	3	3	9
	4	3	3	3	9
	Fleet /SD total:	**12**	**12**	**12**	**36**
	GRAND TOTAL	**24**	**24**	**24**	**72**

1.2 Cod (*Gadus morhua callarias*)

The abundance of cod in the northern Baltic is very low. Finnish fishing vessels operate in the southern Baltic in ICES Sub-divisions 24-26. The total catch of Finnish fishing fleet was about 1164 tonnes in 2003. Finnish catches represented 1.6 % of the total reported cod catches in Sub-divisions 22-32. In the northern Baltic (ICES Sub-divisions 29, 30 and 32), where the abundance of cod is presently zero, we will not organize special sampling in 2005. Cod catch sampling from gill-net and trawl fisheries in the southern Baltic will be organized by Danish and Swedish institutions in ICES Sub-divisions 24-27 and this data is applied to Finnish catches operating in same fishing grounds.

Although cod samples are presently not collected in the northern Baltic, our intention is to preserve the potential and possibilities for sampling and sample analysis, assuming that the stock will recover in incoming years in 2005-2006.

1.3 Salmon

Salmon *(Salmo salar)*

The Finnish commercial catches of salmon in the Baltic Sea are taken from two IBSFC management units, the Gulf of Finland (ICES Sub-division 32) and the Gulf of Bothnia – Baltic Main Basin (ICES Sub-divisions 22-31), both having their own annual TACs. In both areas, two principal types of fishing are engaged, with totally different catch age and length compositions. In the coastal fishery, trap-nets and anchored gill-nets are used to capture mature salmon returning to home rivers in spring and early summer (V-VII). In the offshore fishery, drift-nets and drift-lines are used to capture feeding salmon in autumn and winter months (IX-V). Technical measures are taken to manage both these fisheries.

For the evaluation of the composition of catches in length and in age, a sampling intensity of C3 is required. (Appendix XV: 1 sample of 50 fish/ 100 tonnes). The mean catch rate in 2001-2003 in Finnish commercial fisheries of salmon was 413 tonnes, thus corresponding to 4 samples and 200 individuals (table H.1.2). However, assuming that the MP must cover the basic data needs of stock assessment in both management areas and for both main types of fishing, a much more intense sampling scheme is needed (Table H.1.3.2.).

Another reason for sampling intensity deviating from the magnitudes defined in Annex, Chapter III, H (C3), is Chapter III, I. There it is required that sampling programmes must be implemented to estimate the share of wild and reared salmon in the catches. Besides for the evaluation of the age composition, salmon scale samples are also needed to provide these stock composition estimates. However, somewhat larger sample sizes are needed in these analyses.

Proportions of wild and reared fish in the landings of salmon

According to the regulation (Annex, Chapter III, Section I), a biological sampling programme of the landings must be implemented to estimate the share of wild and reared salmon. The data should be provided quarterly and following the fishing techniques typology described in Appendix IV. The estimates should reach level 1 precision (i.e. ± 25% for a 95% confidence level).

The analysis methods have not been defined in the regulation. Practically, there are two methods that may be used, scale reading and DNA-identification. These methods differ from each other with respect to their properties and costs. Scale reading is cheaper, but it is capable of distinguishing only between the two main groups of fish (wild and reared), and the method suits only for fish originating from one area, the Gulf of Bothnia. DNA-identification is more expensive, but it is capable of distinguishing, besides between wild and reared fish, also between individual salmon stocks, irrespective of their area of origin. Because of these differences, both methods will be used for analysing salmon scale samples. Scale reading will be carried out for all scale samples, and DNA-analysis for a representative sample of the catch.

Both methods may use similar scale samples that are collected for the estimation of catch age composition (Annex, Chapter III, H). In scale reading, the required precision level (level 1) can be achieved by samples of 200, and in DNA-analysis by samples of 100-150 fish, whereas the age composition can be estimated from a sample of 50-80 fish. In order to reach sufficient sample sizes, individual samples will be pooled over time and regions. Samples for the DNA-analysis will be drawn from the pool, weighted according to temporal and spatial distribution and by length classes. The aim is to provide reliable estimates of the proportion of wild salmon and other defined regional or national stock groups (e.g. separately wild stocks originating from either Gulf of Bothnia, from Gulf of Finland, or Baltic Main Basin and Finnish hatchery stocks, Swedish hatchery stocks and so on.) in different Finnish fisheries (offshore and coastal), and in both IBSFC management units (ICES Sub-divisions 22-31 and 32). Such estimates are invaluable for the annual stock assessments and for the control of the technical management schemes.

Quarterly sampling, required by the regulation, is not appropriate in salmon and would be at least as costly and time consuming as the sampling scheme proposed here. In each individual sample 8 DNA-microsatellites will be studied. The spatial stratification of the genetic samples is presented in Table H.1.3.1. Genetic stock composition analysis of catches will be conducted in co-operation with the University of Helsinki.

Costs related with genetic stock identification included in FinForms MP.xls, I Oth Bio.

Table H.1.3.1.Number of salmon individuals to be sampled for genetic stock composition analysis from ICES Sub-divisions 22-32

Months	Fishery	SD22-28	SD29	SD30	SD31	SD32	Total
1-4 and 9-12	Off-shore	300				300	600
5-8	Coastal		200	150	150	200	700
Total		300	200	150	150	500	1300

Finnish salmon fishery

According to fish purchase reports, there are seven fishing harbours in Finland with salmon landings large enough to justify regular sampling. In other harbours, salmon is landed only occasionally or periodically (coastal fishery), making it very difficult and costly to organise functional sampling. In 2002 the landings took place mainly in the following harbours: Kotka in the Gulf of Finland, in Bornholm (Denmark), Maarianhamina in the Åland Isles, Rauma and Uusikaupunki in the Bothnian Sea and Pietarsaari, Ii and Simo in the Bothnian Bay.

Commercial offshore fishery

The offshore fishery exploits mainly feeding salmon and the catches are relatively evenly distributed across the season from October to May. At present, about half of the Finnish commercial salmon catch

is taken in the offshore fishery, and approximately 25% of the catches are landed in foreign countries. To get representative estimates on the length and age (Chapter III, H) and stock (Chapter III, I) composition of the landings, sampling must be disaggregated over time and regionally. Furthermore, each sample should include fish from several fishing vessels and several fishing days.

Offshore landings originating from the Baltic Main Basin (ICES Sub-division 22-28) will be sampled in Maarianhamina and Bornholm, Denmark. At the time of submitting this plan the fishery and trade of Baltic salmon is closed in Denmark due to high dioxin content of the fish, and no predictions for the future fisheries are available. If continued the closure will prevent landing of salmon to Bornholm by Finnish vessels too, and sampling there will become obviate. For landings originating from the Bothnian Sea (ICES Sub-division 30), the potential for sampling will be retained at Uusikaupunki and Rauma, but no samples will be taken unless catches increase from the present low levels (less than 2,000 salmon in 2002). In the Bothnian Bay (ICES Sub-division 31), there is no offshore fishery. In the other IBSFC management area, Gulf of Finland (ICES Sub-division 32), the landings of offshore catches are high enough to allow sampling in Kotka and Helsinki. The sampling scheme is as follows:

- Baltic Main Basin (ICES Sub-division 22-28); Maarianhamina, Åland Islands and Bornholm, Denmark: 1 area * 4 two-month periods * 130 fish = 520 fish (the number of fish is low in relation to catches, but the catches from the Main Basin area are sampled by other nations as well, and the overall number will be high enough). In Bornholm the sampling is conducted in co-operation with the Danish Fisheries Research.
- Bothnian Sea (ICES Sub-division 30); Uusikaupunki and Rauma: 1 area * 4 two-month periods* 50 fish = 200 fish (sampled only in case catches increase from present low levels)
- Gulf of Finland (ICES Sub-division 32); Kotka and Helsinki: 1 area * 4 two-month periods * 80 fish = 320 fish

Table H.1.3.2. Number of salmon individuals to be sampled by season, fishery, gear and ICES Sub-division

Months	Fishery	Gear	SD22-28	SD29	SD30	SD31	SD32	Total
1-4 and 9-12	Off-shore	Long line	220				250	470
	Off-shore	Driftnet	300		200*)		70	570
5-8	Coastal	Driftnet		350				350
	Coastal	Trapnet		150	600	600	350	1700
5-9	River					800		800
Total			520	500	800	1400	670	3900

*) optional

Commercial coastal fishery

Coastal salmon fishery targets on spawning migrants. In a given coastal area, the fishing season lasts only about 2 months (from V-VII), but during these 2 months remarkble changes occur in the age, length and stock composition of the catches. Due to these changes, weekly sampling is needed to get representative samples.

In the Gulf of Finland (ICES Sub-division 32), the most important fishing areas are situated in the eastern part of the Gulf, between Loviisa and Hamina. Catches are mainly landed in Kotka, where the sampling will also be organized.

- Gulf of Finland (ICES Sub-division 32); Kotka: 1 area * 7 weeks * 50 fish = 350 fish

Along the long coast-line of the Gulf of Bothnia, sampling must be disaggregated regionally. To protect spawning migrants, the fishery is opened successively in four concsecutive fishing zones,

beginning from the south. To assess the success of this management scheme, catch samples must be taken from three key areas, which are 1) Åland Sea (ICES Sub-division 29), providing the overall composition of fish schools entering the Gulf; 2) sea area north of the Quark (ICES Sub-division 30-31, Pietarsaari), where fish from Swedish salmon stocks have partly departed from the schools; and 3) Oulu region (ICES Sub-division 31), after which salmon from different stocks start to orientate to their home rivers.

- Gulf of Bothnia – Baltic main Basin (ICES Sub-division 29-31); Maarianhamina, Pietarsaari and Oulu/Simo: 3 areas * 7 weeks * 80 fish = ca. 1700 fish

In 2005, a field study started in 2004 concerning salmon discards in long-line fishery will be continued, see E.1.2.

Biological sampling of salmon in rivers

Catch samples of salmon and sea trout will be collected from the fishery in the wild salmon rivers of the Gulf of Bothnia (Rivers Tornionjoki and Simojoki). This data collection is an integral part of the assessment of spawning run composition and the effects of fishery, and it is strongly linked to the corresponding sampling from the Finnish coastal fishery. The monitored variables include smolt age, sea-age, sex, origin (wild/reared) and size at capture (weight and length). The planned sample size is 800, of which majority are salmon samples from the River Tornionjoki. However, the realised sample size is strongly dependent on the volume of the annual salmon catches in the river, which is highly unpredictable. The sample of 800 represents the situation with higher-than-average catches, according to which costs must be planned. In the River Simojoki the catch sampling is incidental, because the total catch is quite low and the fishermen spread along the river. Therefore the sites, where the main part of the catch would be landed and sampled, do not exist. Organization of the sampling as well as analysis and data treatment is similar to those of the catch samples from the sea fishery.

- The River Tornionjoki and Simojoki; the whole fishing season 800 fish

Costs included in FinForms MP.xls, Worksheet H. A&L Land.

1.4 Sea trout (Salmo trutta)

Sea trout is present along the entire Finnish coast-line in ICES Sub-divisions 29, 30, 31 and 32. Most of the sea trout catch (80-90%) is caught by recreational fishermen. Commercial fisheries take sea trout mainly as by-catch in fisheries targeting whitefish, pike-perch and salmon. The structure of the fishery taking sea trout varies considerably from one sea-area to another, and between spring, summer, autumn and winter seasons. Due to the short migration of the species, different stocks are exploited in different sea-areas. Local technical regulations are used to manage the fisheries. There is no catch quota.

To evaluate the composition of sea trout catches in length and in age, a sampling intensity of C3 is required by the MP (1 sample of 50 fish/ 100 tonnes). The mean catch rate in 2001-2003 in Finnish commercial fisheries of sea trout was 74 tonnes, corresponding to only one sample of 50 fish according to requirements of MP. However, that obtained data would be of any use in regional stock assessment and technical management, the sampling should be more intense in the MP. The minimum requirement is one sample of 50 fish from each ICES Sub-division (SD 29-32) every six months. As the landings are, however, very dispersed in time and space, it is not reasonable to establish any specific sampling programme for sea trout alone. Trout samples will be collected in connection with the sampling of salmon (MP), pike-perch, perch and whitefish (EP) landings. The intended sampling scheme is as follows:

- Archipelago Sea (ICES Sub-division 29): 2 half-year periods * 50 fish = 100 fish
- Bothnian Sea (ICES Sub-division 30): 2 half-year periods * 50 fish = 100 fish
- Bothnian Bay (ICES Sub-division 31): 2 half-year periods * 50 fish = 100 fish
- Gulf of Finland (ICES Sub-division 32): 2 half-year periods * 50 fish = 100 fish

Harbour sampling does not, however, in practice result in a sufficient amount of samples. For example in 2003 only about 60 sea trout were came across aside with the other sampling in the harbours. As pointed out in earlier programme proposals, the tagging would be an appropriate and cost effective method to gather sufficient data on sea trout stocks for the assessment and management purposes. Sea trout tagging has been included within the MP in 2002 and 2003, but excluded in 2004. It is suggested that tagging was taken within the MP again in the following manner.

The average number of tag retuns from a regular tagging lot of 1000 individuals is 100-150. Releasing 2 tagging lots annually in each ICES Sub-division would thus provide the basic data needed to evaluate the composition of trout catches in length and age (in total 200 – 300 tag retuns). The tagging scheme is as follows:

- Archipelago Sea (ICES Sub-division 29): 2 tagging lots * 1000 fish = 2000 fish
- Bothnian Sea (ICES Sub-division 30): 2 tagging lots * 1000 fish = 2000 fish
- Bothnian Bay (ICES Sub-division 31): 2 tagging lots * 1000 fish = 2000 fish
- Gulf of Finland (ICES Sub-division 32): 2 tagging lots * 1000 fish = 2000 fish

Costs included in FinForms MP.xls, Worksheet H. A&L Land.

1.5 Flounder (*Platichthys flesus*)

Flounder fishery is regulated by the fishing rules of IBSFC and in revised data collection regulation flounder is moved to minimum programme.

The commercial flounder catches are annually low: In 2003 the reported commercial catch in Finnish fisheries was 43 tons. Catches in recreational fisheries are about 200-500 tonnes annually.

In 2003 we collected flounder samples from ICES Sub-divisions (SDs) 29, 30 and 32 as follows:

Flounder

Number of samples in 2003	SD 29	SD 30	SD 32	Total
Number of samples:	12	3	10	25
Length measurement:	143	186	300	629
Age determinations:	143	186	300	629

In 2005 our intention is to collect flounder samples from commercial gill-net catches in total 20 samples. (Table H.1.5.1.), and part of the samples in the Gulf of Finland are collected in cooperation with City of Helsinki. Sampling is most intensive in August-October in Archipelago Sea, southern Bothnian Sea and Gulf of Finland. The sampling scheme is simple random sampling.

Costs included in FinForms MP.xls, Worksheet H. A&L Land

Table H.1.5.1. Total number of flounder samples according to area and year quarter in 2005 weighted by the mean catch rates in 2001-2003 (1 sample = 50 individuals).

	Year-	ICES sub-division			
Gear	quarter	29	30	32	Gear/year quarter
	1	0	0	0	0
Gill-net	2	2	2	2	6
	3	3	2	6	11
	4	1	1	1	3
	Total	6	5	9	20
	Grand total	6	5	9	20

2. Extended programme

2.1 European whitefish *(Coregonus lavaretus)*

There is significant commercial fishing for whitefish in the Archipelago Sea, and in the Gulf of Bothnia (ICES Sub-divisions 29, 30 and 31).In the Archipelago Sea (SD 29), gill nets are the main gear type in the whitefish fishery. In the Gulf of Bothnia (SDs 30 and 31), drift nets, set gillnets, trap nets and trawls are used as well. There are 2–3 whitefish forms in the sea area of Finland: river-spawning migratory whitefish and sea-spawning whitefish(es). The migratory whitefish is more common in the catches, the share of the sea-spawning whitefish being about 20-25 %. In many cases the catch consists of both whitefish forms.

The biological sampling should cover both whitefish forms and all gear types, including different mesh size classes of gill nets (27-30 mm, 36-45 mm, and 46-50 mm bar lengths because of the different

selectivity of the different gear types and differences of the whitefish forms in e.g. their growth. According to the commission regulation, based on the landings of commercial fishery (extended programme C3), the estimated number of the catch samples for the Finnish sea area would be only 9 annually, with 450 individuals measured and aged.

The sampling effort needed for successful assessment of whitefish stocks, given the different gear types and whitefish forms, should be the following:

- ICES Sub-division 29: 8 samples, 400 individuals
- ICES Sub-division 30: 18 samples, 900 individuals
- ICES Sub-division 31: 18 samples, 900

Simple random sampling is applied. The numbers of individuals sampled per year quarter and gear type are presented in Table H.2.1.1. Each individual will be measured for length and aged.

Costs included in FinForms EP.xls, Worksheet H. A&L Land.

Table H.2.1.1 Number of whitefish individuals to be sampled by ICES Sub-division, gear type and year quarter. (1 sample = 50 individuals).

Gear type	Year Quarter	ICES Sub-division 29	30	31	Sampling per gear and year quarter
	1	0	0	0	0
Gill net 27-30 mm	2	0	0	50	50
Bar length	3	0	0	50	50
	4	0	0	200	200
	T l	**0**	**0**	**300**	**300**
	1	0	100	0	100
Gill net 36-45 mm	2	150	200	150	500
Bar length	3	150	100	100	350
	4	0	100	0	100
	T l	**300**	**500**	**250**	**1050**
	1	0	0	0	0
Gill net 46-50 mm	2	50	50	0	100
Bar length	3	50	0	50	100
	4	0	0	0	0
	T l	**100**	**50**	**50**	**200**
	1	0	0	0	0
Set gillnet	2	0	150	0	150
	3	0	0	0	0
	4	0	0	0	0
	T l	**0**	**150**		**150**
	1	0	0	0	0
Drift net	2	0	0	0	0
	3	0	50	0	50
	4	0	0	0	0
	T l	**0**	**50**	**0**	**50**
	1	0	0	0	0
Trap net	2	0	0	100	100
	3	0	150	200	350
	4	0	0	0	0
	T l	**0**	**150**	**300**	**450**
	Grand total	**400**	**900**	**900**	**2200**

2.2 Pike-perch (*Stizostedion lucioperca*)

The commercial pike-perch catch is taken for the most part with gill nets in autumn, late winter and spring. In spring, pike-perch is caught also with trap nets.

In recent years, the total Finnish pike-perch landings have been between 400 and 900 tonnes/ year. On the average of 1999-2001, 53% of the catches have been taken from ICES Sub-division 29 (Archipelago Sea), 32% from ICES Sub-division 32 (Gulf of Finland) and 15% from ICES Sub-division 30 (Bothnian Sea). In the very good years of 2002 and 2003, nearly 30% of the catch was caught in the sub-division 30. More than 97 % of the catches are taken by gillnets.

The mesh size of gill nets plays an important role in the management of the pike-perch fishery. In order to assess the effect of mesh sizes on the pike-perch stocks and the proportions of different mesh sizes in the fishery (the official statistics on used mesh sizes is insufficient for fisheries purposes), the biological sampling of pike-perch catch should adequately cover the different mesh sizes mostly used (43 mm, 45 mm, 50 mm bar length) and pike-perch stocks. The pike-perch stocks in different ICES sub-divisions have different growth rates and population dynamics. The sampling in different year quarters is needed to give information of different parts in the populations and for catch predictions. Trap nets have a different, probably lower selectivity pattern than gillnets, and a different length and age distribution in the catch. The sampling schedule based on the commission regulation (extended programme C3) is not adequate for these purposes (six samples, 300 individuals).

Simple random sampling is applied. The samples needed for the assessment of pike-perch stocks in the ICES Sub-divisions 29, 30 and 32 are the following:

ICES Sub-division	**29**	**30**	**32**
Gill nets, randomly different mesh sizes (see text above)	12	12	12
trap nets	3	3	0

The annual sampling schedule consists of 35 samples and 1 750 individuals (Table H.2.2.1.).
Costs included in FinForms EP.xls, Worksheet H. A&L Land

Table H.2.2.1. Number of pike-perch individuals to be sampled by ICES Sub-division, gear type and year quarter. (1 sample = 50 individuals).

Gear type	**Year Quarter**	**ICES Sub-division**			**Sampling per gear and year quarter**
		29	**30**	**32**	
	1	150	150	150	450
Gill net , randomly	2	150	150	150	450
different mesh sizes	3	0	0	0	0
(see text above)	4	300	300	300	900
	Total	**600**	**600**	**600**	**1800**
	1	0	0	0	0
Trap net	2	150	150	0	300
	3	0	0	0	0
	4	0	0	0	0
	Total	**150**	**150**	**0**	**300**
	Grand total	**750**	**750**	**600**	**2100**

2.3 Perch (*Perca fluviatilis*)

Most of the commercial perch catch is taken in April - June with trap nets and gill nets, and in summer and autumn with gill nets.

In recent years, the total commercial perch catch has been 800–1000 tonnes/ year. On the average of 1999-2001, 49 % of the catch has been taken from ICES Sub-division 30 (Bothnian Sea) and 33 % from ICES Sub-division 29 (Archipelago Sea). More than 63 % of the catches are taken by gillnets and 35 % by trap nets.

The number of samples assessed on the basis of the extended programme C3 (nine samples, 450 individuals) is not adequate, because the perch from trap net and gill net catches represent different parts of the populations with e.g. different growth rates. Both the trap net and gill net catch should be representatively sampled, including at least two mesh size classes of gill nets. Simple random sampling is applied. The adequate sampling schedule for perch is for both ICES Sub-divisions, 29 and 30, the following:

Gill nets < 38 mm bar length:	5 samples,	250 individuals
Gill nets 38-50 mm bar length	10 samples,	500 individuals
Trap nets	4 samples,	200 individuals

Annually this totals 38 samples and 1 900 individuals, which will all be measured (Table H.2.3.1.). Costs included in FinForms EP.xls, Worksheet H. A&L Land

Table H.2.3.1. Number of perch individuals to be sampled by ICES Sub-division, gear type and year quarter. (1 sample = 50 individuals).

Gear type	Year quarter	ICES Sub-division		Sampling per gear and year quarter
		29	30	
	1	0	0	0
Gill net <38 mm	2	200	200	400
bar length	3	0	0	0
	4	50	50	100
	Total	**250**	**250**	**500**
	1	0	0	0
Gill net 38-50 mm	2	300	300	600
bar length	3	0	0	0
	4	200	200	400
	Total	**500**	**500**	**1000**
	1	0	0	0
Trap net	2	200	200	400
	3	0	0	0
	4	0	0	0
	Total	**200**	**200**	**400**
	Grand total	**950**	**950**	**1900**

I. Other biological samplings

1. Minimum programme

1.1 Growth curves and the relations between age/length and maturity

The data concerning growth, sex ratios and maturity (Baltic herring, sprat, salmon and sea trout) will be collected annually and compiled at a minimum every third year, as presented in Table I.1.1.1. The compilation of the data will be partly carried out in cooperation with other Baltic countries.

Herring and sprat. For annual assessment purposes, information concerning growth and age/length are collected quarterly by length stratified sampling from Finnish fisheries in ICES sub-divisions 29-32. From late March to early June, a special sampling for maturity (and sex ratios) is conducted before spawning time, which differs depending on e.g. latitude and sea-area.

Cod. The growth curves age/length relationship as well as maturity are not available for the northern Baltic Sea, because of cod presently being non-existing in ICES Sub-divisions 29-32, which cover Finnish fishing zone. The information collected by other member countries will cover these aspects in the main distribution area of Baltic cod.

Salmon and sea trout. Data to derivate growth curves and relations between age/length for salmon and sea trout accumulate from the basic catch sampling programme and tag recapture data.

1.2 Sex-ratio in landings

Data concerning the sex-ratio of herring, salmon, sea trout and sprat landings will be compiled every third year, as requested by the regulation (Appendix XVI). The first set of data will be compiled based on NP 2003, and the second based on NP 2006, as presented in Table I.1.1.1.

Herring and sprat. The sex ratios of herring and sprat are recorded concurrently from the individuals sampled for quarterly age-length keys in ICES sub-divisions 29-32, and also from maturity samples.

Cod. The sex-ratio of cod is not available for the northern Baltic Sea, because of cod presently being non-existing in ICES Sub-divisions 29-32, which cover Finnish fishing zone. The information collected by other member countries will cover these aspects in the main distribution area of Baltic cod and there is no need to organize additional sampling for this parameter.

Salmon and sea trout. In sampling of salmon landings gender of fish is determined and recorded routinely from each individual fish. This will enable the derivation of the sex ratio for the whole duration of the programme. For the sea trout landings gender data is generally impossible to compile by harbour sampling due to low catches and high scattering of the landings to the numerous fishing harbours and private docks. Therefore the sex ratio of the sea trout landings will be mainly derived from the tag recapture data.

Table I.1.1.1. Long-term work plan reviewing timetables of collecting and updating of biological parameters in years 2002-2006, the availability of collected data, and whether these studies will take place within the framework of broad-scale international co-operation.

Other biological sampling					Country			FINLAND		MP
					Reference period (years)			2002 - 2006		
Species	Area	Parameter	Data collected & **updated**		Plan for data collection & **update**			Annual collection period (months)	Data availability	Framework
			2002	2003	2004	2005	2006			
Clupea harengus	IIId	*Growth*	X	**X**	X	X	**X**	I - XII	Coll. year +1	ICES WG
		Sex-ratio	X	**X**	X	X	**X**	I - V	Coll. year +1	ICES WG
		Maturity	**X**	**X**	**X**	**X**	**X**	I - IV	Coll. year +1	ICES WG
Sprattus sprattus	IIIb-d	*Growth*	X	**X**	X	X	**X**	I - XII	Coll. year +1	ICES WG
		Sex-ratio	X	**X**	X	X	**X**	I - VI	Coll. year +1	ICES WG
		Maturity	**X**	**X**	**X**	**X**	**X**	I - VI	Coll. year +1	ICES WG
Gadus morhua	IIIb-d	*Growth* *Sex-ratio* *Maturity*	Derogation							
Salmo salar	IIIb-d	*Growth*	X	**X**	X	X	**X**	I - XII	Coll. year +1	ICES WG
		Sex-ratio	X	**X**	X	X	**X**	I - XII	Coll. year +1	ICES WG
		Maturity								
Salmo trutta (*	IIIb-d	*Growth*	X	**X**	X	X	**X**	I - XII	Coll. year +1	National management agencies
		Sex-ratio	X	**X**	X	X	**X**	I - XII	Coll. year +1	
		Maturity								

(*Estimates are based mainly on the tag recoveries

2. Extended programme

None.

CHAPTER IV. MODULE OF EVALUATION OF THE ECONOMIC SITUATION OF THE SECTOR

J. Collection of economic data by groups of vessels

1. Minimum programme

Collection of economic data is based on register survey that combines information from several data sources. The main data sources are Business Register of Statistics Finland and data on catches and fishing vessels from Finnish Game and Fisheries Research Institute (FGFRI). This will be supplemented with a survey to enquire additional information concerning the fishing operation and employment.

The target population for evaluation of the economic situation in the fishing sector are fishing units that are considered operational at the reference year. (Firms are considered operational when the annual turnover/catch value exceeding € 9,134.) The determination of fishing sector follows the one used in statistics (Council Regulation (EEC) No 3037/90: Nomenclature Générale des Activités Economiques dans les Communautés Européennes). All operational firms with fishing as their main branch should be listed in the Business Register of Statistics Finland. This data is supplemented with fishing units with corresponding activity in the fishing registers of FGFRI. These registers are combined to create the frame register of the survey.

Economic data is based on the financial statements collected by Statistics Finland. Data on catches and vessels are based on data in FGFRI. These will be linked to firms in the Business Register and classified according to the segmentation presented in the regulation. At the same time the coverage of the data will be checked. Data collected will cover the parameters mentioned in the regulation (Annex, Chapter IV and Appendix XVII; see table J.1.1) according to the segmentation included in Appendix III (the segmentation of Finnish fishing fleet in table C.1.1).

Table J.1.1 ***Economic information per fleet segment as defined in Appendix XVII.***

Parameter (per fleet segment)	**Source of data**
Income (turn-over) - Total, per species	Total turn-over is available from data on financial statements Income per species calculated from data on financial statements, data on fish landings (see. Chapter III E.1.1) and data on fish prices
Production costs -Crew, fuel, other operational costs	Total production costs and labour costs are available from data on financial statements The other costs will be estimated
Fixed costs	Will be calculated from assets (see investment)
Financial position - Share of own/borrowed capital	Available from data on financial statements
Investments (asset)	Will be calculated by replacement value-method
Prices per species	Available from data on fish prices
Employment - Full time/part time/ FTE	Number of fishermen and FTE will be estimated
Fleet, - No, GT, kW, age, gear used	Available from fishing fleet registers
Effort	Available from data on fishing effort

Collection of economic data

Financial statements are based on data collected by Statistics Finland. Primary sources of information are direct inquiries and business taxation material supplemented by Business Register data. Data is based on corporate balance sheet and profit and loss account data. Statistics Finland will check for the validity of the data. Economic data will be linked and combined to data on landings, effort and capacity data in FGFRI. Missing data is imputed using additional information by stratum. Data will be classified according to segmentation in the regulation. Employment will be presented in number and FTE.

Production costs will be estimated based on earlier surveys.

Gathering price data

The price data on fish subject to quota (Baltic herring, sprat, salmon, and cod) are calculated from the purchasing notifications submitted by the first hand purchasers of the fish to the Regional Employment and Economic Development Centres. The price data are checked with the book keeping of 20 fish wholesalers in coastal areas. The prices on other fish species are calculated from that data. The prices are calculated by species, size-class, degree of processing and by month.

Reliability

Financial statements are collected exhaustively from the fishing firms in Business Register. Also the information of capacity and landings and effort data covers all vessels. However, the under-coverage in the Business Register (compared to target frame) has to be estimated and remedied. This kind of register survey gives a good coverage in terms of number of vessels and proportion of value, but does not allow calculating unbiased error estimators for the parameters. In addition, financial statements are declared by fishing firms and division of these firms into vessel groups as required may cause problems when there are several activities in a firm.

Time scale and delay

Information of the economic situation of fishing sector will be provided not earlier than one year after the period investigated. Landings and price information of year 2004 will be finalised by June 2005. Fishing vessel register is updated constantly. Preliminary information on Financial statements from year 2004 will be available on the 4th quarter of 2004.

Costs of collection of economic data by groups of vessels in 2003

Majority of the costs is labour costs. Some travels to collect data from various sources will be made. Subcontracting includes costs of getting access to databases in Statistics Finland and outsourced updating of the frame register. Also the costs of wholesalers and processors of providing price data are compensated.

2. Extended programme

None.

K. Collection of data concerning the processing industry

1. Minimum programme

Collection of economic data concerning the processing industry is based on lessons from the pilot study carried out in 2003. The data collection is a register survey that combines information from several data sources. The main data sources are Business Register of Statistics Finland and data on processing in Finnish Game and Fisheries Research Institute (FGFRI).

The target population are all fish processing firms (determined in Council Regulation (EEC) No 3037/90: Nomenclature Générale des Activités Economiques dans les Communautés Européennes). All operational firms, with fish processing as their main branch, should be listed in the Business Register of Statistics Finland. This data will be supplemented with the data in FGFRI.

Economic data of fish processing firms are gathered from financial statements and by Statistics Finland. Volume of fish processing will be estimated with data in FGFRI. Data is collected to cover the parameters mentioned in Article 13 and Annex XIX (see table K.1.1).

Table K.1.1 ***Economic information from processing industry as defined in Appendix XIX.***

Parameter	**Source of data**
Raw material - Total and per species	Estimated fish processing.
Income - Total and per product	Total turnover is available from data on financial statements. Income per product not available.
Production costs - labour, energy, raw material, packaging, other running costs	Total production costs available from data on financial statements. Production costs by cost groups available data on financial statements (information from the pilot study needed).
Fixed costs	Available from data on financial statements
Financial position - share of own and borrowed capital	Available from data on financial statements
Investment (asset)	Available from data on financial statements
Prices per product	Not available
Employment - Numbers, FTE	Available from data on financial statements
Capacity utilisation	Not available

Collection of economic data

Financial statements are based on data collected by ST. Primary sources of information are direct inquiries and business taxation material supplemented by Business Register data. Data is based on corporate balance sheet and profit and loss account data. Statistics Finland will check for the validity of the data. Missing data will be interpolated.

An estimation method will be developed to estimate the use of raw material. This will be done based on the information in Statistics Finland and FGFRI. It will follow the guidelines laid down in the pilot study carried out.

Reliability

Financial statements are collected exhaustively from the fishing firms in Business Register. The precision of the estimation procedure cannot be assessed in advance.

Time scale and delay

Information of the economic situation of fish processing sector will be provided not earlier than one year after the period investigated. Preliminary information on Financial statements from year 2003 will be available on the 4th quarter of 2004.

Costs of Collection of data concerning the processing industry

Majority of the costs is labour costs. Some travels to collect data from various sources will be made. Subcontracting includes costs of getting access to databases in Statistics Finland.

2. Extended programme

Aquaculture production has a significant role in Finnish fishery sector. Aquaculture production dominates the fishery market in the primary production and also as a raw material in processing industry. We will examine the importance of aquaculture production as a part of primary production and try to investigate the linkages between production and fish processing.

Target population is all fish farming firms in Finland. The frame population is based on the Business Register in Statistics Finland and the fish farming register updated by Finnish Game and Fisheries Research Institute. All the firms will be surveyed by a mail inquiry that is supplemented with a survey by telephone. In this survey it will be enquired the volume of the production by species and the use of the production (linkages to downstream activities). The job creation capacity will also be examined. The results will be assessed comparing those from processing industry.

Costs of Collection of data concerning aquaculture production

Survey will be done by a postal survey supplemented with a telephone survey. Telephone survey will be outsourced and postal survey causes mailing and survey form service costs.

CHAPTER V. DATA BASE, CO-ORDINATION AND ADMINISTRATION

L. Data base

1. Biological data and fishery data

The biological data and fishery data for stock assessment will form the majority of the database. Our estimate is that in our database there will be about 80 000 data rows per year, and because of the biological part of the database, it will be located at Finnish Game and Fisheries Research Institute, which is also responsible to maintain and update of the database. The main aim of forming a national databank/database is to create a high-grade and error free collection of data. In the beginning of year 2005 we will take into routine use an electronic fish measuring board, which enables storing of the basic parameters straight from measuring board into electronic form. We will use a consulting company for developing the software needed in uploading the data from measuring boards (in ASCII–format) to the biological database of Finnish Game and Fisheries Research Institute. At the same time we will also revise the possible needs to update the software of our biological database, keeping in mind the requirements of EU data collection programme.

The disaggregated primary data of our national programme will be stored into the databank in Finnish Game and Fisheries Research Institute. The data will be delivered and stored also into the BaltCom-database (www.baltcom.org), which has now developed into FishFrame data-base/ data analysis system, which was developed in the first place by the study projects funded by DG XIV, the International Baltic Sea Sampling Program I, II (IBSSP) in 1998-2001. The storage of the biological information is done in agreed format and the format has been coordinated between the nations bordering the Baltic Sea. The exchange format for stock assessment data has been agreed and it is in force. The database is situated in the Danish Institute for Fisheries Research in Charlottenlund, Copenhagen. The database will be accessible via Internet and is protected (primary data and aggregated data) by username and password. Aggregated information will be directly accessible by the Commission and by the request for Member States.

Costs containing both the software and database development included in FinForms MP.xls, Worksheet Data Base

2. Economic data

A database for economic data will be kept in the FGFRI.

M. Co-ordination

1. National co-ordination

A national co-ordination meeting will be organised yearly at FGFRI by the national correspondent and the contact person from FGFRI during Spring. The meeting will be attended by persons from those FGFRI offices (8) that are involved in the national programme on data collection in order to properly co-ordinate the tasks for the year 2004. The national correspondent will inform the Commission about time and place of this meeting when the date has been agreed.

A national steering committee, including the national correspondent and key persons from FGFRI, has been set as encouraged by Committee for Fisheries and Aquaculture. The steering committee has 1-2 meetings per year.

2. International co-ordination meetings

2.1 Regional co-ordination

Regional co-ordination will mainly take place within the framework of Baltic Regional (Sampling) Planning Group, including one annual meeting (2 persons). The 2005 meeting will be held at Danish Institute for Fisheries Research, Charlottenlund Castle, 4-6 May 2005.

2.2 Planning groups and other relevant meetings on data collection

Our plan is to participate in the work of ICES-PGCCDBS, including plenary meeting in March (2 persons) and workshop on precision level (2 persons). In addition, FGFRI will organise the workshop on age reading on herring, as explained in chapter H.1.1 (Workshop on age reading on herring). We will also participate in the workshops on precision level (AZTI, Zukarrieta) and on economic data (venue to be decided). In addition, we include ICES Study Group on Salmon Scale Readings (ICES-SGSSR), if it is organised in 2005 (ICES meeting calendar is released in the autumn). ICES-SGSSR is a relevant working group dealing with age determination of MP species of EU data collection programme.

Costs included in FinForms MP.xls, Worksheet Co-ordination

N. Administration of the Finnish national programme

1. Ministry of Agriculture and Forestry

The administration of this national data collection program is the responsibility of the Ministry of Agriculture and Forestry. Ministry will designate a national correspondent in charge of the implementation of this program and Council Regulation. The national correspondent will inform Commission regularly of the state of progress of the national program.

The contact information of the Ministry of Agriculture and Forestry and their contact person is as follows:

The Ministry of Agriculture and Forestry
Department of Fisheries and Game
Mr. Ali Lindahl (replacement till 10.8.2004 Mr. Heikki Lehtinen)
Kluuvikatu 4 A
P.O. Box 30
FIN-00023 Government
Helsinki
FINLAND
Tel. +358-9-16001
Fax: +358-9-160 52284

2. Finnish Game and Fisheries Research Institute (FGFRI)

The Ministry of Agriculture and Forestry will be assisted by the Finnish Game and Fisheries Research Institute, (FGFRI) which will designate two contact persons responsible to take care practical issues between the Ministry and Research Institute.

The contact information of the Finnish Game and Fisheries research Institute and contact persons are as follows:

Finnish Game and Fisheries Research Institute

Mr. Timo Myllylä
Turku Game and Fisheries Research
Itäinen Pitkäkatu 3
20520 Turku
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APPENDICES

APPENDIX 1. COLLECTION OF THE DATA CONCERNING COMMERCIAL MARINE CATCHES

Commercial marine catch data collection is based on fishermen register and fishing vessel register maintained by the Fishery Units of the Employment and Economic Development Centres (EEDCs) and by the provincial government of Åland. All those who are engaged in professional fishing are obliged to report their catches to the EEDCs of their region. Depending on the fishery, the reporting is made by EU log books, or by coastal fishery reports. Salmon catches are reported in kilograms and in number. The data is recorded in the EEDCs and provincial government of Åland to a Access database. All the data is forwarded to the Finnish Game and Fisheries Research Institute, where the data is validated and cross checked with the abroad landings data.

The fishing data of the vessels at least 10-metres in length are entered in the EU-logbooks. The data entered are the dates on which catches were made, the type and amount of gear used in fishing, the volume of the catch by species and the catch area. The trawling time of the trawler is reported in hours. The fishing data of vessels under 10 meters are entered in a monthly coastal fishery report. The data entered are the size of the catch by species, the catch area, the type and amount of gear used in fishing, and the number of catch days. The salmon fishing data of vessels under 10 meter are entered in a salmon fishery report for coastal fishermen that has to be completed for each catch. The data entered are the size of the catch, the catch area, the type and amount of gear used in fishing, and the number of catch days.

The catch data covers all catches including those landed abroad. The catch is converted to be equal to live weight. Prepared catches in catch reports are converted to live weights with conversion factors by species. In the Finnish fishing vessels preparing of fish onboard is gutting, and very seldom filleting. Conversion factors are given in the next table.

	Gutted, with head	Fillets, with skin
Atlantic cod	1.18	
European flounder	1.18	2.44
European perch	1.32	2.44
Northern pike	1.23	2.00
Pike-perch	1.15	1.92
Baltic herring	1.18	2.33
European whitefish	1.08	1.56
Baltic Salmon	1.11	1.39
Rainbow trout	1.20	1.72
Sea trout	1.11	1.56

APPENDIX 2. AMENDMENT FOR INCLUDING RIVER SURVEYS OF BALTIC SALMON IN DATA COLLECTION REGULATION

Management objective

In 1995, the International Baltic Sea Fisheries Commission (IBSFC) adopted long-term management goals for the Baltic salmon fisheries, which led to the agreement on the Salmon Action Plan (SAP) in 1997. The most important operational management objective is to gradually increase the natural smolt production of wild Baltic salmon to attain at least 50 % of the natural production capacity of every individual river before the year 2010, while retaining the catches as high as possible (IBSFC 1995, http://www.ibsfc.org). To evaluate the achievement of this goal two type of information are needed:

a. the smolt production capacity of each Baltic river

b. the current smolt production of each Baltic river

These pieces of information have a direct link to the required management actions, and therefore they have a very dominating role in the overall assessment of the salmon stocks.

Another agreed management objective of SAP is that "Wild Salmon populations shall be re-established in potential Salmon rivers" (http://www.ibsfc.org). This objective calls for collection of data on reproduction success of salmon in the rivers, where actions aiming at re-establishment of salmon population are taking place.

Data need for the stock assessment

The stock-recruitment curves for Atlantic salmon are of compensatory form (Symons, 1979; Solomon, 1985; Kennedy and Crozier, 1993; Chaput *et al.,* 1998), and the maximum of the curve represents the potential smolt production capacity. No stock-recruitment curves have been established for any of the Baltic salmon stocks (Romakkaniemi *et al.,* 1995) as no stock-recruit data have been collected. Prévost et al. (2003) have demonstrated the wide regional variation in the stock-recruit dynamics of Atlantic salmon. Thus, regional stock-recruit data have to be collected to successfully incorporate stock-recruit dynamics into an assessment model. A typical stock-recruit data comprises count of spawners, count of smolts, and collection of related biological samples (age, sex ratio, fecundity).

Attempts have been made to estimate the smolt production capacity of the Baltic Sea rivers. The most recent approach was modeling of the expert knowledge and the associated uncertainty (Uusitalo *et al.*, unpubl.; ICES, 2002). This approach can be considered as an initial step providing carrying capacity estimates as it utilises the best present information on the productivity of Baltic salmon stocks, but also brings in the uncertainty of operational objectives in the fisheries management. The high level of uncertainty in these estimates reflects the lack of information on Baltic salmon stocks within the rivers i.e. their productivity.

In the assessment model of Baltic salmon used by the ICES Baltic Salmon and Trout Assessment Working Group (WGBAST) the time series of estimated smolt production is one of the basic data needs (ICES 2003). The less there is uncertainty connected to the current smolt production estimates, the lower is the uncertainty within the assessment results. Lower uncertainty in assessment would allow for higher TAC compared to when the uncertainty is greater. The present modeling (ICES 2004) assesses the abundances of the six Baltic Sea stock groups (assessment units), provided that required data for each group were available.

Too few Baltic index rivers are established to provide the regional information on which to base smolt production estimates. At present the smolt production is directly measured only in four out of forty Baltic wild salmon rivers: The rivers Simojoki (Finland), Tornionjoki (Finland/Sweden), Salaca (Latvia) and Luga (Russia). In the rest of the rivers, indirect measurements, e.g., electrofishing or plain expert opinions are used as a basis of the smolt production estimates. In the Gulf of Bothnia rivers, a hierarchical Bayesian regression model utilising both the smolt trapping and the electrofishing data reveals the high level of uncertainty in the smolt production estimates when based on electrofishing data only (Mäntyniemi *et al.,* 2003; ICES 2004; Mäntyniemi *et al.,* 2004). Extending smolt trapping by establishing index rivers in each stock group would significantly improve precision of smolt production estimates. Also the juvenile surveys (electrofishing) needed to link information from index rivers to the rest of the rivers in each region is inadequate at present.

The need to extend direct measurements of juvenile production and to collect stock-recruit data in the Baltic salmon rivers has been recognized and repeatedly suggested. For example, SGRN has noted that the absence of the river surveys makes the MP inadequate to assess if the agreed management objectives are achieved (SEC 200, Brussels 9-13 December 2002). The ICES WGBAST has recommended that "Index rivers with intense monitoring should be established in different regions. In these rivers, not only parr densities (as required by IBSFC) but also escapement of spawners to rivers and smolt production should be measured. Standardisation of monitoring and estimates of wild smolt and parr production as well as potential production estimates should be carried out both regionally and in the entire Baltic Sea. Projects aimed at improved baseline monitoring of salmon and sea trout populations in countries in the south-eastern part of the Baltic Sea and at estimation of potential production levels should be initiated" (ICES, 2003). Establishing Baltic Sea index rivers has been suggested by IBSFC in the RESOLUTION IV: "National and regional index rivers should be designated for the pilot monitoring of wild Salmon populations considering, at least, the escapement and smolt production" (http://www.ibsfc.org). River surveys were also suggested as a part of the Swedish NP for data collection programme in 2004 and the proposal was based on similar arguments as shown here.

Amendment of the Regulation

The present goal of the Baltic salmon management is to increase the smolt production of each stock to 50 % of the maximum calls for follow-up of the annual smolt production in each river with reasonable accuracy. The same information plays a crucial role in the assessment of Baltic salmon, as a basis of stock projections and management advise. A set of regional index rivers with direct measurements of the number of spawners and the resulting smolt production, together with monitoring of parr densities in all the Baltic rivers would provide a cost-effective, reasonably precise means to provide the data necessary for assessment model, allowing for the follow-up of the compliance with the managements objective.

The present EU regulation does not regard river surveys of salmon as a monitoring tool in spite of their essential role in the management of Baltic salmon. Therefore the Commission should consider amending the regulation to make surveys in wild salmon rivers by the means of smolt trapping, electrofishing and counting of spawners as allowable operations within the minimum data collection programme (MP). Moreover, the Commission should consider amending the regulation to make electrofishing surveys allowable operations under the extended programme (EP) in so-called potential rivers, where actions aiming at re-establishment of wild salmon stocks are underway.

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