FISKERIVERKET

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ANNUAL REPORT

FOR

THE SWEDISH NATIONAL PROGRAMME FOR

COLLECTION OF FISHERIES DATA 2010

Under

Council Regulation (EC) No 199/2008
Commission Regulation (EC) No 665/2008
Commission Decision 2010/93/EU

I. General framework

This report gives the results of the Swedish National Programme for collection of Fisheries data in 2010 (Sweden_NP_Proposal_2010_Text_25-Mar-10.doc). The report follows the SGRN´s *Guidelines for the Submission of Technical Reports on the National Data Collection Programmes under Council Regulation (EC) No 199/2008 Commission Regulation (EC) 665/2008 and Commission Decision 2008/949/EC* Version 2009. All tables are presented in a separate document. Detailed information regarding the CV calculations made is presented in Annex Ia and Ib.

2010 was the second year of implementing the new DCF (2009-2013). No major changes compared to what was planned for 2010 occurred, and the difficulties to fulfill the requirements in the new DCF have been handled over the year.

II. National data collection organisation

II.A National correspondent and participating institutes

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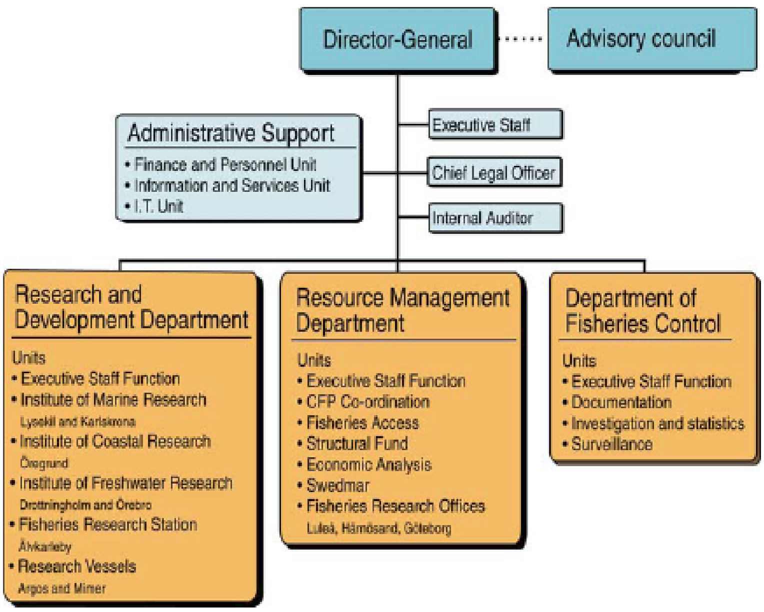
Participating units
The partners (units) are all coming from the same state agency, Swedish Board of Fisheries.



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National co-ordination meetings

National coordination has been undertaken several times during 2010 where participating institutes and units are connected through electronic communication techniques. For these meetings guidelines and deadlines, development of databases has been communicated as well as discussions regarding strategy for DCF related work.

Physical meetings were undertaken to start up and learn how to work with COST. Several physical meetings have also been arranged during 2010, focusing on calibration of age reading and maturity. A few one-day meetings focusing on database development and workshops for users have also been undertaken.

II.B Regional and International co-ordination

II.B.1 Attendance of international meetings

The planned international coordination which was of relevance for Sweden in 2010 are listed in table II.B.1. Sweden participated in all planned meetings except from WKDRASS which was cancelled and WKFLAT. The Swedish participant who was planned to go to the meeting passed away and no stand-in was available so soon after.

II.B.2 Follow-up of regional and international recommendations

General recommendations made by RCM Baltic and RCM NS &EA from 2005 to 2010 and actions taken by Sweden are listed below.

Source	Recommendation	Action
RCM Baltic (2010)	*In order to move forward and get data into FF, a workplar was set up to support the MS in the upload process. Landing data, sampling and effort data for 2009 was agreed to be uploaded by all MS before 1 Sept 2010.*	SWEDEN WAS RESPOSIBLE TO COORDINATE THE SKYPE MEETINGS THE MEETINGS WERE HELD AS PLANNED AND SWEDEN UPLOADED THE REQUESTED DATA.
RCM Baltic (2010)	*To ensure the wide implementation of COST, the RCM Bal recommends that after the trial period lasting until May 20 the working experience of member states will be reassessed and a training workshop should be organized in the first half of 2012.*	SWEDEN PUT A LOT OF EFFORT DURING 2010 TO LEARN HOW TO USE COST. 5 SWEDISH PARTICIPANTS WERE SENT TO THE WORKSHOP. SWEDEN ALSO SENT A FEED BACK LETTER (SEPT 2010) ON THE COST TOOL TO THE COMMISSION.
RCM Baltic (2010)	*In order to be able to analyse the current sampling level of sprat in the Baltic and suggest optimal sampling levels for future regional coordinated sampling, the data must be available in an agreed format and checked for errors. Data has to be uploaded in Fishframe All MS should upload 2009 sprat data into Fishframe before the end of October 2010.*	SWEDEN HAS UPLOADED THE REQUESTED DATA
RCM Baltic (2010)	*For institutes collecting small volumes of otoliths for certain species and when new species are to be sampled, task sharing of age reading is necessary in order to optimise the use of age reading expertise. The RCM Baltic recommends that the NC´s starts to discuss, decide and agree on which MS should be responsible for age reading of species rarely caught in BITS survey (brill, plaice, turbot, dab, sole). An agreement of task sharing for aging eel should also be established.*	SWEDEN SUPPORT THE IDEA OF TASK SHARING AND WELCOMES THE DISCUSSION TO TAKE PLACE BETWEEN NC´S.
RCM	*In order to make analyses of the data collected within DCF*	SWEDEN WILL UPLOAD DATA

Baltic (2009)	*and to optimise the coordination work, the developed regional database FishFrame 5.0 should be used within the RCM Baltic.*	(all species, all metiers lvl 6) FOR 2009 IN FF 5.0.
RCM Baltic (2008)	*In order to use the time of the RCM more efficient, the pre-processing of the exchange data tables, namely the merging of the data on fisheries statistics and planned sampling NP proposal tables in the NPs, for the harmonisation of the NPs, including the quality checks, should be carried out before the next RCM.*	ACTION WILL BE TAKEN IN 2009
RCM Baltic (2007)	***THE RCM BALTIC RECOMMENDS THAT ALL MS SUBMIT DATA IN THE AGREED FORMAT WHEN REQUESTED. THE COMPILED REGIONAL DATA SHOULD BE DISTRIBUTED TO THE MEMBERS OF RCM BALTIC WELL BEFORE THE MEETING***	SE COMPILED THIS DATA TO THE MEETING IN 2007 AND WILL PREPARE REQUESTED DATA FOR FUTURE MEETING TO GAIN COOPERATION BETWEEN MS IN THE RCM.
RCM Baltic (2007)	***THE RCM BALTIC RECOMMENDS THAT ALL MS UPLOAD DATA (EFFORT, LANDINGS-ALL SPECIES, SEA-SAMPLING, SAMPLING OF LANDINGS) FOR THE TRAWL FISHERIES TARGETING COD IN THE BALTIC IN ORDER TO ALLOW ANALYSIS OF THE FISHERIES FACILITATING FUTURE TASK SHARING OF DISCARD SAMPLING***	DONE
RCM Baltic (2007)	***THE RCM BALTIC RECOMMENDS THE DESCRIPTION OF THE SOURCE OF THE INFORMATION AND WHEN APPLYING A SAMPLING PROCEDURE A DESCRIPTION OF METHOD AND STRATEGY HAS TO BE CLEARLY DESCRIBED IN THE NATIONAL PROGRAMME TO GIVE USEFUL INFORMATION ON QUALITY OF THE OBTAINED DATA. IN THE TECHNICAL REPORT THERE SHOULD THEN BE A QUALITATIVE QUALITY REPORT CONTAINING A THOROUGH DESCRIPTION OF THE METHODS AND STRATEGIES USED AND THE CHARACTERISTICS OF THE GATHERED DATA. THE RCM BALTIC RECOMMENDS TO NOT USE THE PRECISION LEVEL AS AN INDICATOR OF HETEROGENEITY BUT TO RATHER USE THE MEAN VALUE AND STANDARD DEVIATION.***	SE WILL DESCRIBE SAMPLING METHOD AND STRATEGY IN NP FOR 2009-10. A QUALITY REPORT IN TR FOR 2009 WILL BE PRESENTED IN 2010.
RCM Baltic (Jan 2005)	***3.1 BALTIC RCM RECOMMENDS THAT EACH MS ON MONTHLY BASIS UPDATES "REAL TIME MONITORING SPREADSHEET" GIVING THE ACTUAL SAMPLING STATUS IN EACH COUNTRY AND GIVING THE COVERAGE AS DEFINED ACCORDING TO THE DCR.***	NOT USED, AND THEREFORE SE HAS NOT FILLED IT IN.
RCM Baltic (Jan 2005)	***3.3 BALTIC RCM RECOMMENDS THAT AN ANALYSIS REVEALING AND COMPARING THE CONSEQUENCES OF DIFFERENT RAISING METHODS IS MADE AS SOON AS EFFORT INFORMATION AND MATCHING RAISING PROCEDURES ARE INCLUDED IN THE FISHFRAME DATABASE.***	SWEDEN WILL UPLOAD EFFORT INFORMATION TO THE FISHFRAME DATABASE IN ORDER TO BE ABLE TO ANALYZE DIFFERENT RAISING PROCEDURES.
RCM NS & EA (2010)	*RCM recommended that MS start to implement COST*	SWEDEN HAS PUT A LOT OF EFFORT TO IMPLEMENT AND USE COST.
RCM NS & EA (2010)	*In order to have correct reference list of species and stocks in Appendix VII 2010/93and to avoid inconsistencies and errors in the tables filled in by MS in their NP proposals RCM NS &EA made a recommendation to establish a reference list for revision of the guidelines and templates for future NP proposal*	SWEDEN HAS A RESPONISBILITY TO ACT ON THIS RECOMMENDATION BEFORE NEXT RCM 2011. TO BE DONE.
RCM NS & EA (2009)	*RCM NS&EA recommends Sweden and Denmark to review inconsistencies in the raising/compilation procedures of discard data and to upload discard data into FishFrame.*	SWEDEN WILL UPLOAD ALL DATA TO FISHFRAME INCLUDING DISCARD DATA.

RCM NS & EA (2009)	*RCM NS&EA recommends Sweden and Denmark to compile and submit discard data of sole in Division IIIa to WGBFAS.*	SWEDEN WILL SUBMIT ALL DATA TO FISHFRAME INCLUDING DATA OF SOLE.
RCM NS & EA (2008)	***In order to use the time of the RCM more efficient, the pre-processing of the exchange data tables, namely the merging of the data on fisheries statistics and planned sampling NP proposal tables in the NPs, for the harmonisation of the NPs, including the quality checks, should be carried out before the next RCM.***	ACTION WILL BE TAKEN IN 2009
RCM North Sea & East Arctic (2007)	***THE RCM NS&EA RECOMMENDS THAT ALL MS SUBMIT DATA IN THE AGREED FORMAT WHEN REQUESTED. THE REGIONAL DATA SHOULD BE COMPILED WELL BEFORE THE MEETING AND BE DISTRIBUTED TO THE RCM PARTICIPANTS.***	SE COMPILED THIS DATA TO THE MEETING IN 2007 AND WILL PREPARE REQUESTED DATA FOR FUTURE MEETING TO GAIN COOPERATION BETWEEN MS IN THE RCM.
RCM North Sea & East Arctic (2006)	***RCM NS AND EA TO UPLOAD THE 2004-2006 LANDINGS AND EFFORT STATISTICS INTO FISHFRAME TOGETHER WITH THE ASSOCIATED DATA FROM MARKET AND ON-BOARD SAMPLING, FOR ALL SPECIES WITHIN THE REMITS OF THE WGNSSK BY APRIL 1ST, 2007.***	DONE
RCM North Sea & East Arctic (2006)	***THE RCM NS &EA RECOMMENDS THAT DENMARK AND SWEDEN PREPARE A WORKING DOCUMENT PROPOSING HOW REGIONAL DATA COLLECTION COULD BE ARRANGED BY USING THE KATTEGAT AS A TEST ARE. THE WD WILL BE PRESENTED AT WGBFAS 2007 AND FOR THE RCM´S.***	NOT FULFILLED TO WGBFAS. THE PROCESS WILL START BY FILLING IN SUGGESTED TABLES DESCRIBING THE PRESENT SAMPLING METHODS.
RCM North Sea (2005)	***13.1 RCM NORTH SEA INSISTS THAT ALL COUNTRIES PARTICIPATE IN THE EXERCISE OF COMPARING SAMPLING STRATEGIES ON COMMERCIAL CATCHES AND DISCARDS BY PROVIDING THE RELEVANT INFORMATION TO THE SWEDISH COORDINATORS.***	DONE
RCM North Sea (2005)	***14.1 RCM NORTH SEA AGREED THAT IN ORDER TO CO-ORDINATE ACTIVITIES EFFECTIVELY THERE WAS A NEED TO DEVELOP A BETTER METHOD OF PRESENTING THE COVERAGE DISCARD SAMPLING AND THE NETHERLANDS HAVE AGREED TO PREPARE A TEMPLATE BASED ON FLEET SEGMENTATION (CURRENTLY UNDER REVIEW) AND CIRCULATE BEFORE NEXT YEAR'S MEETING.***	SWEDEN WILL PREPARE DATA AS SOON AS THE TEMPLATES ARE DELIVERED.
RCM North Sea (2005)	***14.2 RCM NORTH SEA RECOMMENDED THAT WHERE DISCARD SAMPLING COVERAGE IS RESTRICTED TO A LOW LEVEL, THE COUNTRY CONCERNED, CONSIDERS THE INPUTS FROM OTHER COUNTRIES AND ENTER INTO BILATERAL AGREEMENTS WHERE APPROPRIATE.***	WHEN GREATER KNOWLEDGE OF OTHER COUNTRIES DISCARD SAMPLING PROGRAMMES IS ACHIEVED, SWEDEN WILL DO THIS WHERE NECESSARY
RCM North Sea (2005)	***14.3 RCM NORTH SEA STRONGLY SUPPORTS THE INITIATIVE TO DEVELOP A DISCARD ATLAS AS IT IS REGARDED AS A MOVE WHICH WOULD PROVIDE USEFUL INFORMATION TO SUPPORT DECISION MAKING IN THE COORDINATION OF DISCARD SURVEYS.***	SWEDEN WAS REPRESENTED BY ONE PARTICIPANTS IN THE DISCARD ATLAS MEETING IN ISPRA (2006). SWEDEN WILL ALSO TAKE PART IN THE STEERING COMMITTEE.

III Module of evaluation of the fishing sector

III.A General description of the fishing sector

No major changes occurred in the fishing sector during 2010.
In the 1st of January 2009 there were 1 471 Swedish vessels with licences for commercial fishery and 1 688 licensed fishermen.

The Swedish fleet consists of a majority of small vessels fishing with passive gear and a smaller number of larger ships mainly using trawls. Most demersal and pelagic trawlers have their home port on the Swedish west coast. Pelagic trawlers on the west coast mostly target herring, sprat and mackerel. Pelagic trawlers operating in the northern part of the Baltic sea mainly target vendace. Demersal trawlers in the Baltic Sea mostly target cod whereas demersal trawlers on the west coast mostly target Norway lobster and shrimp. Vessels using passive gears are spread along the entire coastline. Geographically, the activities are concentrated to ICES divisions IIIa and IIId and to some extent, divisions IVa and IVb.

The Swedish fleet can roughly be divided into three larger groups:

- Pelagic (trawl/seine) e.g. herring/sprat, mackerel, blue whiting, sandeel, vendace
- Demersal (trawl) e.g. gadoids, witch flounder, shrimp, Norway lobster
- Passive gear (gillnets, fyke-nets, longlines, creels) e.g. cod, herring, salmon, eel, plaice, flounder, turbot, perch, pike, pike-perch, Norway lobster

The table below briefly describes the number of vessels per segment in Sweden in 2009.

Segment	No vessels
Vessels using passive gears	831
Demersal trawlers < 24 m	80
Demersal trawlers > 24 m	17
Demersal trawlers targeting Shrimp	50
Demersal trawlers targeting Norway Lobster	76
Pelagic trawlers targeting Vendace	32
Pelagic trawlers < 40 m	16
Pelagic trawlers > 40 m	13
Inactive vessels	356
Total number of vessels	1 471

III.B Economic variables

SUPRA REGION: BALTIC SEA, NORTH SEA AND EASTERN ARCTIC, AND NORTH ATLANTIC

There is a need for a brief explanation to the values in the annual report tables. Where a cell consists of two values describing a range the first number is related to survey conducted by the Swedish Board of Fisheries and the second number is related the exhaustive survey carried out by Statistics Sweden.

III.B.1 Achievements: results and deviation from NP proposal

Further stratification in data collection

Sweden uses a further stratification of the fishing fleet than required by the DCF in order to provide better final estimates.

Vessels in fleet segments are divided by economic activity where all vessels are divided into two groups, one with a low level of economic activity and one group with regular economic activity. The threshold is calculated as twice the yearly Swedish price base amount. Data on the economic activity level groups are collected and estimated separately. It is important to point out that data on all vessels are collected and estimated and in the end aggregated together. The use of a threshold is in order to provide better estimates.

In the demersal trawlers and fixed pots and traps segments a further stratification based on target species is used. Demersal trawlers are divided into four groups based on vessels targeting crustaceans, shrimp, vendace or other species (mostly cod and/or flatfish). Fixed pots and traps are divided into vessels targeting crustaceans or other species. The reason behind this is that crustaceans, shrimp and vendace (actually vendace roe) is high price species and the economics of these kinds of fisheries is highly different from fisheries targeting other species.

Estimation of total income, gross operational costs, assets, debt and crew wages

Gross operational costs and total income for the segments are collected through a census survey by Statistics Sweden. If the coverage rate is less than 70 percent an evaluation of the representativeness of the data has to be conducted. The following is a description of how Statistics Sweden collects the data, corrects for missing data and evaluates the representativeness.

Total income, gross operational costs, assets, debt and crew wages is estimated in the same way and therefore the estimation description only describe how total income is collected.

Census data from financial accounts has been collected by Statistics Sweden. Statistics Sweden matches economic data from tax declarations by enterprises to individual vessels. In some cases this may not be possible if a declaration is missing or if the deviation between declared income and income from fisheries is too large to be reliable. Statistics Sweden corrects for non-responses and missing observations with a correction factor. The correction factor is the quota between average value of landings for all vessels in the segment and the average landings value for all vessels with processable data. Statistics Sweden also evaluates the representativeness of the data.

$$cf = \frac{\overline{V}_j}{\overline{V}_l}$$

where

cf = Correction factor

$\overline{V}_j$ = Average landings value in segment *j*

$\overline{V}_l$ = Average landings value among vessels with processable data

The declared income is estimated as the average declared income of vessels with processable data multiplied with the correction factor multiplied with the number of vessels in the segment.

$$I_j = \bar{I}_j \times cf \times N_j$$

where

I_j = Total declared income in the segment *j*

$\bar{I}_j$ = Average declared income in the segment *j*

N_j = Number of vessels in segment *j*

Estimation of individual income items

Value of landings per segment is compiled from sales, notes, landings declarations logbooks and monthly journals (coastal journals) which are all kept by the Swedish Board of fisheries. The compilation is exhaustive.

Fishing rights were not transferable in Sweden during 2008 neither temporarily nor permanent. No income from fishing rights did exist in 2008.

Direct subsidies are compensation for temporary fishing stops regarding cod fishing in the Baltic Sea from the European Fisheries Fund (EFF). Records are kept at the Swedish Board of Fisheries which is the authority responsible for the EFF. The collection is exhaustive.

Other income for a specific vessel is estimated as total income for the specific vessel, as compiled by Statistics Sweden, minus value of landings for the specific vessel.

Estimation of individual cost items

In order to allocate numerical values to individual cost items an allocation key for each segment is estimated. The allocation key is estimated through a survey by the Swedish Board of Fisheries.

The allocation key is estimated as the percentage of the gross operational costs for the individual cost:

$$p_{ij} = \frac{\overline{c}_{ij}}{\sum_{i=1}^{4} \overline{c}_{ij}}$$

where

$\overline{c}_{ij}$ = weighted mean in the sample for costs item *i* for segment *j*

p_{ij} = percentage of gross operational costs related to the individual cost item *i* for segment *j*

$i =$ cost item where 1 = fuel costs, 2 = repair & maintenance costs, 3 = variable costs, 4 = non-variable costs
$j =$ Segment e.g. PTS VL40XX

The weighting scheme applied to cost item is

$$\bar{c}_{ij} = \left(\frac{\sum c_{ij}}{n_j} \right) \times W_j$$

where

$c_{ij} =$ observation on cost item *i* for segment *j* in the sample from the survey
$n_j =$ number of observations in the sample
$W_j =$ weigh calcutaled as $W_j = \frac{\overline{D}_{pj}}{\overline{D}_{sj}}$, where $\overline{D}_{pj} =$ average number of days at sea for segment *j* in the population and $\overline{D}_{sj} =$ average number of days at sea for segment *j* in the sample

Values for individual costs items for individual segments are calculated as:

$$\hat{c}_{ij} = GOC_j \times p_{ij}$$

where

$\hat{c}_{ij} =$ estimated (fitted) value of individual costs item *i* for segment *j*
$GOC_j =$ Gross operational costs for segment *j* as estimated by Statistics Sweden

Fuel consumption for a segment is estimated using a Horvitz-Thompson-type estimator

$$\hat{F}_j = N_j \times \bar{f}_j \times W_j$$

where

$\hat{F}_j =$ Estimated fuel consumption for segment *j*
$N_j =$ Total number of vessels in the segment
$\bar{f}_j =$ average fuel consumption in sample for segment *j*
$W_j =$ is the same weight used in the estimation for individual costs items.

Fishing rights were not transferable in Sweden during 2008 neither temporarily nor permanent. No costs from fishing rights did exist in 2008.

Estimation of Engaged crew and FTE's

Engaged crew is estimated for each stratum using a Horvitz-Thompson-type estimator:

$$\hat{E}_j = \frac{N}{n}\sum_{k=1}^{n} e_{kj}$$

where

$\hat{E}_j =$ Estimated number of engaged crew in segment *j*

$e_{kj} =$ observation in the sample for vessel *k* on the number of engaged crew for segment *j*

N = Total number of vessels in segment

n = Total number of observations in a stratum

FTE's are calculated according to:

$$FTE = ((totEC \times DAS \times hAS) + (aveCT \times hOS \times w)) / FTh$$

where

$FTE =$ Full time equivalents per vessel

$totEC =$ Total engaged crew per vessel

$DAS =$ Days at sea per vessel

$hAS =$ Number of working hours per day at sea, engaged crew and vessel. A working day is assumed to be 6 hours for vessels fishing with passive gears and 12 hours for vessels fishing with active gears.

$aveCT =$ Averaged crew per fishing trip and vessel

$hOS =$ Average number of working hours in onshore per crew member, week and vessel

$w =$ Number of working weeks per year and vessel

$FTh =$ Number of working hours in a year for a full time employee. For national FTE's the number of working hours in year is assumed to be 1800 and for harmonised FTE's the number of hours is assumed to be 2000.

Estimation of Imputed value of unpaid labour

Imputed value of unpaid labour is calculated as the difference between labour costs given by the income tax declaration and the number of FTE's (harmonised) times an assumed yearly minimum salary (Including Social Costs):

Imputed Value of Unpaid Labour = Labour cost – FTE (harmonised) x Yearly Minimum Salary (Including Social Costs)

Vessels displaying a positive difference are able to pay the crew a minimum wage for the time they work and are therefore removed. For all the vessels displaying a negative difference the labour costs are lower than what is expected based on assumed yearly minimum salaries. The sums of the negative differences are summarized for each segment and the absolute numbers of the sums are the imputed value of unpaid labour.

Assumed minimum wages (including social costs equal to 40 %) are 252 000 SEK for vessel shorter than 24 meters and 336 000 SEK for vessel longer than 24 meters. Excluding social costs the corresponding salaries are 180 000 SEK and 240 000 SEK.

Estimation of Capital value and cost

The estimation of value of physical capital and annual depreciation costs will be based information on insurance value given by the questionnaire survey. The insurance value is estimated by divided the vessels into two groups, one less then 24 meters and one for vessels larger than 24 meters. A regression analysis for each group will then be run based on the following formulas:

Vessels less than 24 meter
LN Insurance value = $\beta_0 + \beta_1$ * LN age + β_2 * LN kW + β_3 * LN length + β_4 * D_{DTS} + β_5 * D_{FPO} + β_6 * D_{HOK} + β_7 * D_{DFN} + β_8 * D_{PGP} + β_9 * D_{CRU} + β_{10} * D_{PRA} + β_{11} * D_{VEN} + ε
Vessels 24 meter and over
LN Insurance value = $\beta_0 + \beta_1$ * LN age + β_2 * LN kW + β_3 * LN length + β_4 * D_{PTS} + β_5 * D_{CRU} + β_6 * D_{PRA} + ε

Where D equals dummy variables for dominant fishing gear or target species. Target species are CRU = Crustaceans, PRA = Prawns and VEN = Vendace.

Based on the results of the regressions fitted values of insurance values are calculated for each vessel. All vessels are divided into three groups:
1. Vessels fishing with passive gears
2. Vessels fishing with active gears with a length under 24 meters
3. Vessels fishing with active gears with a length over 24 meters

For each group the gross tonnage and insurance value is summarized for each individual building year. The sum of insurance value for each building year is divided by the sum of gross tonnage for each building year to obtain the depreciated price per capacity unit for each building year. Based on the depreciated price capacity unit a linear regression with a quadratic form is carried out to estimate the price per capacity unit for the current year of interest. The estimation equation is:

$$PPC_t = \beta_2 + \beta_1 t + \beta_2 t^2 + \varepsilon$$

where

$PPC_t =$ Price per capacity unit for building year *t*
$t =$ building year

And the price per capacity unit for 2008 is calculated as:

$$P\hat{P}C_{2008} = \hat{\beta}_0 + \hat{\beta}_1 \times 2008 + \hat{\beta}_2 \times 2008^2$$

The quadratic form is used to compensate for digressive depreciation.

In calculation the depreciated replacement values price per capacity unit for 2008 is used. In calculating the depreciated historical values price per capacity unit for 2008 is deflated using time series of the consumer price index. Both types of capital value calculations use the template connected to the PIM methodology in the capital valuation report (No FISH/2005/03).

Capital costs and the value of capital for each segment are calculated by extracting the values for each of the three large groups from the template and are reweighted to distribute them to individual segments according to the weighting scheme:

$$Cap_j = Cap_G \times \frac{\sum kW_j}{\sum kW_G} \times \frac{\sum Age_G}{\sum Age_j} \times \frac{Num_j}{Num_G}$$

where

Cap = Capital value or capital costs depending on which variable to be calculated
kW = Engine power
Age = Age of vessel

Num = Number of vessels

The subscript *j* refers to the segments e.g. DFN VL1218. The subscript *G* refers to the groups described earlier for which total capital value and capital costs are estimated i.e. vessels fishing with passive gears, vessels fishing with active gears under 24 meter and vessels fishing with active gears over 24 meters.

Pelagic fishing rights became transferable in Sweden by the 1st of November 2009. The first transactions of fishing right took place in January 2010. Since no transactions of pelagic fishing rights took place during 2009 the fishing right had no market value in 2009. From 2011 and onwards will the value of pelagic fishing rights be surveyed, starting on data from the transactions taken place during 2010. This will first be possible to report in the 2011 Annual Report. ~~From 2010 and onwards will the value of pelagic fishing rights be surveyed~~

Estimation of in-year investments

In-year investments for a segment is estimated using a Horvitz-Thompson-type estimator

$$\hat{II}_j = N_j \times \bar{ii}_j \times W_j$$

where

$\hat{II}_j$ = Estimated fuel consumption for segment *j*

N_j = Total number of vessels in the segment

$\bar{ii}_j$ = average fuel consumption in sample for segment *j*

W_j = is the same weight used in the estimation for individual costs items.

Financial position

Is calculated as debt, as compiled by Statistic Sweden, divided by estimated vessel replacement value.

Fishing enterprises

Number of enterprises consisting of different amount of vessels is compiled from the fleet register kept by the Swedish Board of Fisheries.

III.B.2 Data quality: results and deviation from NP proposal

As seen in table III.B.1 the final data delivered to the Swedish Board of Fisheries from Statistics Sweden shows that all segments except demersal trawler and/or seiners 18-24 m and 24-40 display a coverage rate less than 70 percent in the census survey carried out by Statistics Sweden. Reasons for non-response may be several, such as missing observations and outliers (as defined by the acceptance criteria established by Statistics Sweden). Statistics Sweden conducts an analysis of non-responses and correct for this by using a correction factor based on income from fisheries (supplied by the Swedish Board of Fisheries) and total income from the Statistics Sweden data bases.

Survey data has been collected by the Swedish Board of Fisheries through questionnaires and the aim has been a coverage rate of at least 10 % or a minimum of 10 observations in each segment. Two segments display an achieved sample number less than 10 observations; pelagic trawlers and/or seiners 24 to 40 meters and over 40 meters (TM VL2440 and 40XX) with an achieved sample number of 8 respectively 9 observations. The achieved sample rates are 50 and 69 percent respectively, which is in line with what was the aim in the national programme.

Estimates of financial position were calculated as debt, as compiled by Statistics Sweden, divided with vessel replacement value estimated by Swedish Board of Fisheries. In the NP Sweden stated that financial position was to be estimated as debt/asset ratio from the data delivered by Statistics Sweden.

Clustering was necessary due to confidentiality reasons. The clustering scheme can be seen in table III.B.2. Clustering has been made with segments similar to other segments, except for inactive vessels which have been clustered with non-important segments with distinct characteristics.

III.B.3 Follow-up of regional and international recommendations

Source	RCM Recommendation	Action
RCM Baltic (2009)	*Economic variables: The inclusion of a methodology report in the NPs as proposed by SGECA, would provide significant benefits*	SWEDEN WILL GIVE A THOROUGH DESCRIPTION OF THE METHODS USED TO SAMPLE AND ESTIMATE THE ECONOMIC DATA IN THE NATIONAL PROGRAMME
RCM Baltic (2007)	*The RCM Baltic recommends the description of the source of the information and when applying a sampling procedure a description of method and strategy has to be clearly described in the national programme to give useful information on quality of the obtained data. In the technical report there should then be a qualitative quality report containing a thorough description of the methods and strategies used and the characteristics of the gathered data.* *The RCM Baltic recommends to not use the precision level as an indicator of heterogeneity but to rather use the mean value and standard deviation.*	Sweden will describe sampling method and strategy in NP for 2009-10. A quality report in TR for 2009 will be presented in 2010.
RCM NS&EA (2007)	*The RCM NS&EA recommends setting up a workshop to clarify all outstanding issues concerning the fleetbased approach with regard to economic data collection. Workshop on economic data collection with the following ToRs:* *1) At what level should economic data be provided – clarification.* *2) If a vessel uses different gears how should the cost per gear type/metier be calculated? Use of correction factors/coefficients?* *3) Other methodological issues concerning the fleet based approach.*	Recommendations from the Liaison Meeting were that these issues were to be addressed under SGECA 08-03.
RCM Baltic (2007)	*In compliance with the RCM NS-EA, the RCM Baltic recommends that the Commission arranges a workshop to clarify all issues concerning the fleet based approach. Terms of reference:* *At what level should economic data be provided – clarification.* *If a vessel uses different gears how should the cost per gear type/metier be calculated? Use of correction factors/ coefficients?*	

	Are collected data sufficient to calculate cost with respect to gear type/metier? If not, which amendments have to be done? *Other methodological issues concerning the fleet based approach.*	
RCM North Sea & East Arctic (2007)	*The RCM NS&EA recommends setting up a workshop to clarify all outstanding issues concerning the fleet-based approach with regard to economic data collection*	Sweden participated in SGRN-SGECA 08-01: Implementation for the collection if indicators for the fleet-based approach and establishment of regional sampling designs for the new data collection framework
RCM North Sea & East Arctic (2008)	*The RCM NS&EA recommends that the Chair of the RCM NS&EA circulates the notes related to economic variables to the other RCMs in time to help inform their discussions of these matters, and to help determine if the views of the RCM NS&EA with regards to suggestions for areas for STECF-SGECA to look at are supported.* *The RCM NS&EA also recommends that the following actions be carried out before the STECF-SGECA Data Quality workshop (planned for 2009 quarter 1), in order to increase the effectiveness of the workshop with specific regard to clustering:* *1. A questionnaire be sent to Member States to determine what practice is followed in Member States, to identify if any formal procedures exist.* *2. Work should be carried out by Member States prior to the workshop on the degree of variation within fleet segments of indicators as suggested below so that at the workshop various options and their implications for the quality of results can be tried out* *In addition, as part of the wider preparation for the quality workshop, the RCM NS&EA recommends:* *3. A summary of procedures reported in NP proposals for the collection of economic data be drawn up (with a possible repeat of the 2004 exercise to collect such information from Member States).* *4. That SGECA work to develop early in 2009 a manual collating the various guidance that exists on the derivation of economic variables as part of helping to promote the use of such guidance by Member States during 2009.*	Sweden participated in SGECA 09-03: Report of the Working Group on the quality aspects of the collection of economic data - methods of calculation of the indicators and sampling strategies
RCM NS & EA (2009)	*Economic variables: The inclusion of a methodology report in the NPs as proposed by SGECA, would provide significant benefits*	SWEDEN WILL GIVE A THOROUGH DESCRIPTION OF THE METHODS USED TO SAMPLE AND ESTIMATE THE ECONOMIC DATA IN THE NATIONAL PROGRAMME

III.B.4 Actions to avoid shortfalls

The general trend in surveys both domestically and international is decreasing response rates in surveys. The Swedish Board of Fisheries is continuously looking in to different possibilities of raising the response rate. In 2010 the Swedish Board of Fisheries put an information provider obligation regarding surveys of the economic performance of the fishing fleet into place. A failure to respond to economic surveys under the DCF may lead to economic sanctions.

III.C Biological - metier-related variables

THE BALTIC SEA

III.C.1 Achievements: results and deviation from NP proposal

Results of the sampling in 2010 in relation to what was planned are presented in tables III.C.3, III.C.4, III.C.5 and III.C.6. In the National Programme 2010 Sweden asked for derogations to sample some minor metiers and/or fishing grounds. These metiers are excluded from the tables. A main overall reason for deviations from what was planned is that it sometimes can be difficult to predict fishing pattern by metier for the sampling year at the time of compilation of the National Programme.

Midwater trawl fisheries targeting demersal fish (OTM_DEF_>=105_1_110), sub 25-32
The usage of midwater trawls in the Baltic Sea cod fisheries fluctuate considerably between years. It was already stated in the National Programme that the fishery only would be sampled if it was of any significance. In 2010 was the fishery very limited, only 16 trips were conducted in total. As a consequence none of planned 3 sampling trips was carried out. The fishery is from 2010 and onwards sampled within the same sampling frame as the bottom trawl fishery. The overall achievement within this sampling frame was 22 sampled trips out of 23 planned (table III.C.4).

Bottom trawl fisheries targeting demersal fish (OTB_DEF_>=105_1_110), subdivision 22-24
In 2010 more than 70% of the catches (and >70% of the trips) from this metier origins from the second and third quarter. The number of trips conducted by the fishing fleet was very limited in the other quarters. As a result Sweden did not achieve the planned number of trips in quarter 1 and 4. The temporal pattern of the Swedish bottom trawl fishery for cod in western Baltic (subdivision 22-24) is very much connected to national and international management actions for the eastern Baltic (were Sweden have a larger quota) since the same vessels are involved in both fisheries.

Trawl fisheries targeting small pelagic fish (PTM_SPF_16_31_0_0), subdivision 22-29
The assumption for the planned number of trips is that the fishery is conducted all year around in the main subdivisions (24, 25, 27, 28 and 29). This is written in the National Programme. The fishery have however been very limited (or non existent) in some of the subdivisions in some quarters implying that the planned no of trips to be sampled was not achieved.

Trawl fisheries targeting small pelagic fish (OTB_SPF_16-31_0_0), subdivision 30-31
Shortfall of 5 trips due to problems for fishermen to collect the fish samples and lower fishing activity during the first part of quarter 2.

Set gillnet targeting small pelagic fish (GNS_SPF_<110_0_0)
Shortfall of 2 fishing trips due to problems for fishermen to collect the fish samples.

Set gillnet fisheries targeting demersal fish (GNS_DEF_>=110_0_0) …. ii) flatfish
There is a mistake in NP Table III.C.6, the planned number is two fishing trips, not four trips.

Trap net fisheries targeting anadromous species (FPO_ANA_0_0_0)
Sampling of catches at sea in combination with detailed data from catch journals filled in by fishermen is considered enough. However, in the Swedish National Programme also sampling

at markets was included by mistake, which explains the pronounced deviation (2183 %) between planned and achieved number of trips in Table III.C.4 (this sampling strategy has been omitted from year 2011 and onwards). Regarding the detailed catch journals in which fishermen record their catches, this sampling strategy proved out to work much better than expected in 2009, but due to a mistake the planned number of trips was not updated accordingly between 2009 and 2010 in the National Programme. This explains the large discrepancy between planned and achieved number of trips for this sampling strategy in Table III.C.4. Table III.C.5 gives a summary of all samples of salmon and trout including those sampled in the recreational fishery.

<u>Longline fisheries targeting anadromous species (LLD_ANA_0_0_0), Subdivision 25-26</u>
After the ban of the Baltic Sea offshore driftnet fishery (GND_ANA>=157_0_0) in 1 Jan 2008, an increasing magnitude of long line fishery (LLD_ANA_0_0_0) was observed in 2008-2009. In line with the NP proposal 2009-2010 (III.E.2) this motivated to initiate sampling of the long line fishery in 2010. Sampling took place at a rather small scale in December (Table III.C.3). This is explained by the need for cooperation to ensure day of landings and testing of a relevant design. In Table III.C.6 data of salmon and trout from long line fishery are given as a separate métier.

III.C.2 Data quality: results and deviation from NP proposal

Sweden initiated in 2009 a work to improve the designs of the metier sampling programmes taking the outcomes of WKACCU and WKMERGE into account. This work continued in 2010 and includes identification of proper sampling frames and probability based ways to select primary sampling units. At the same time we are trying to sort out some of the logistical problems that arise from the new more statistically sound sampling designs. The new designs will improve the possibilities to evaluate possible bias and thereby also accuracy. Sweden has for a number of years been waiting for the outcome of the COST project to get tools for estimation of quality indicators such as CVs. During 2009 Sweden started to work with the tools provided in order to i) investigate if and where the tools can be used to evaluate the Swedish data and ii) evaluate the Swedish sampling wherever possible. Also this work continued in 2010. Unfortunately it became evident that the COST tools were not suitable for the Swedish sampling design (at least not directly) in many cases. This means that the evaluation on if and how the COST tools could be used is an ongoing work and the analysis have not been finalised yet. Meantime, and for the sake of the annual report, Sweden have calculated mCVs for *length frequencies* of different species and stocks (table III.C.5). Details regarding the estimation of precision (mCV) are presented in Annex Ia and the results reported in Table III.C.5. Overall the required precision target for length compositions was fulfilled. The COST tools have been used to estimate CVs for *volumes* of discards (table III.C.5) were appropriate.

<u>Trap net fisheries targeting anadromous species (FPO_ANA_0_0_0)</u>
There is a need for fine-tuning the sampling method in suitable coastal areas as well as refine journals to increase quality of the collected data.

<u>Longline fisheries targeting anadromous species (LLD_ANA_0_0_0)</u>
As the sampling methods are currently under development, there is a need to improve coordination and cooperation with landing harbours.

III.C.3 Follow-up of regional and international recommendations

Source	Recommendation	Action
RCM	*For the purposes of regional understanding of sampling activities,*	SWEDEN WILL COMPILE

Baltic (2010)	*National information on sampling should be compiled regionally in advance of the next meeting.*	AND SUBMIT SUCH INFORMATION UPON REQUEST
RCM Baltic (2009)	*For the purposes of ranking métiers to sample, National data on effort, landings and value by métier and fishing ground should be compiled regionally in advance of the next meeting. To enable this, participants from MS should strictly respect the agreed naming conventions of fishing ground, métiers and units of the variables as well as the deadline for submission of the national data.*	SWEDEN WILL USE THE AGREED NAMING OF FISHING GROUND, METIERS AND UNITS OF THE VARIABLES AS WELL AS RESPECT THE DEADLINE.
RCM Baltic (2009)	*For the purposes of regional understanding of sampling activities, National information on sampling should be compiled regionally i advance of the next meeting. To enable this, participants from MS should strictly respect the agreed naming conventions of fishing ground and métiers as well as the deadline for submission of the data.*	SEE ABOVE
RCM Baltic (2009)	*For the purposes of understanding the heterogeneity of métiers and the consequences for task sharing and discard sampling, national descriptions of the regionally ranked métiers should be compiled using the format in annex 3. To enable this, participants from the should strictly respect the agreed naming conventions of fishing ground and métiers as well as the deadline for submission of the information. Appointed persons are responsible for requesting the data and compiling it on a regional level*	SWEDEN WILL PRODUCE THE DESCRIPTION OF THE METIERS USING THE FORMAT IN ANNEX 3 BEFORE THE RCM 2010.
RCM Baltic (2008)	***In the NP proposals, a short description of all métiers selected by the 90% ranking procedure should be provided. Such a table would enable RCM to identify whether a métier with the same name covers the same or different fisheries in different NPs.***	SE HAS ALREADY INCLUDED A SHORT DESCRIPTION OF ALL METIERS IN PROGRAMME FOR 2009-2010.
RCM Baltic (2007)	***REGIONAL SAMPLING 4.1 UNTIL ROBUST INTERNATIONAL GUIDELINES FOR ANALYSIS OF LOGBOOK DATA IS AVAILABLE RCM BALTIC MADE A FEW RECOMMENDATIONS HOW TO DEAL WITH ALLOCATION RULES.***	SE HAS COMPLIED WITH INTERIM ALLOCATION RULES MADE UP IN THE RCM

III.C.4 Actions to avoid shortfalls

One of the main reasons for inconsistencies between planned no of trips to be sampled and what is achieved is that it is sometimes is difficult to predict spatial and temporal fishing patterns for some metiers at the time of writing the National Programme. To some degree this is inherent to the time lag between the compilation of the National Programme and the sampling year. To a certain degree the problem can be reduced by implementation of proper sampling frames where the metiers can be seen as domains instead of strata. This is something that Sweden is working on and will continue to work on the forth coming years. Sweden will further continue to develop the sampling designs in order to reduce some of the logistical problems that have risen after implementing a more random selection of trips to sample.

<u>Trawl fisheries targeting small pelagic fish (OTB_SPF_16-31_0_0), subdivision 30-31</u>
To secure that sampling of all planned fishing trips will be carried out, the whole sampling process will be evaluated and necessary alternations made.

<u>Set gillnet targeting small pelagic fish (GNS_SPF_<110_0_0)</u>
Also in this fishery the logistics will be evaluated and if necessary, changed.

<u>Trap net fisheries targeting anadromous species (FPO_ANA_0_0_0)</u>

There is a need to get a better overview of the entire sampling scheme, including discard of undersized salmon by fishermen

<u>Longline fisheries targeting anadromous species (LLD_ANA_0_0_0)</u>
There is a plan to increase sampling magnitude of this métier in 2011.

THE NORTH SEA AND EAST ARCTIC

III.C.1 Achievements: results and deviation from NP proposal

Results of the sampling in 2010 in relation to what was planned are presented in tables III.C3, IIIC.4, IIIC.5 and IIIC.6. A main overall reason for deviations from what was planned is that it sometimes can be difficult to predict fishing pattern (or changes in fishing pattern) by metier for the sampling year at the time of compilation of the National Programme.

Further, a large proportion of the Swedish fleet fishing for demersal species and crustaceans are further relatively small (<24 m). Most of them avoid being at sea in bad weather (or do not want to bring observers in bad weather due to safety conditions). This means that after prolonged period of bad weather Sweden sometimes are lagging behind in sampling of all fisheries and need to prioritise trips in the end of the quarter. Since the data from the metier sampling presently primarily is used to produce estimates of discards metiers with high and/or variable levels of discards are prioritised. In 2010 it was a cold winter with a lot of ice in the smaller fishing harbours. This prevented many smaller vessels from fishing and consequently influenced the sampling of some metiers (in particular passive gears). Deviations from aim on a metier basis are expressed below.

<u>Trawl fisheries targeting demersal fish (OTB_DEF_90-119_0_0), IIIaN,</u>
<u>-national metier targeting witch flounder</u>
The Swedish demersal trawl fishery is divided into two national metiers one targeting primarily cod, haddock and saithe and another targeting witch flounder. At the time of the compilation of the National Programme for 2010, these fisheries were quite distinctive from each other. In particular the discard pattern (species, size and amount) differed a lot. It was also, at the time, possible to create different sampling frames for the national metiers. The same type of gears is however used in both fisheries. Already in 2009 it was difficult to sample the fisheries independently from each other since it became common for the fishermen to change target species in the middle of a trip. The catches of witch flounder did further decrease and by catches of cod and saithe became more important in this fishery reducing the distinctness of the two national metiers. In 2010 the catches of witch flounder dropped even further. In total only 80 “witch flounder trips” were conducted by the fleet and it became difficult to sample. Despite several attempts, only 1 out of 6 planned trips could be carried out. In 2009 and 2010 Sweden tried to use unique sampling frames for the two metiers. This turned out to be problematic and the metiers will be treated within one sampling frame in the future. This sampling frame will also include the *Nephrops* fishery without sorting grid since this fishery is performed with more or less the same gear and by the same vessels (some expected *Nephrops* trips (or part of trips) turned out to be demersal fish trips and vice versa).

<u>Trawl fisheries targeting crustaceans (</u>OTB_CRU_35-69_0_0<u>), IIIa, IV</u>
Sweden fell short to sample 3 out of 12 trips in this fishery due a combination bad weather and shortage in staff.

<u>Pot and trap fisheries targeting crustaceans (</u>FPO_CRU_0_0_0), IIIa
Sweden fell short to sample 4 out of 12 trips. The main reason for this was severe ice coverage in the first quarter seriously limiting the fishery.

<u>Trawl fisheries targeting crustaceans (</u>OTB_CRU_35-69_1_18<u>), IIIa, IV</u>
This metier is more or less exclusively catching *Pandalus*. In 2010 Sweden run a self-sampling programme for the metier in witch Institute of Marine Research are buying unsorted samples of catches from randomly selected commercial vessels. The random selection of vessels resulted, as in 2009, in some problems such as e.g fishermen forgetting to bring samples (or parts of samples/information) ashore. All the planned trips were thereby not sampled. After 2 years of

problems with this self sampling programme Sweden has in 2011 put more dedicated work power into this programme as well as a validation scheme. Hopefully this will improve the situation during the forth coming years.

Gillnet fisheries targeting demersal fish (GNS_DEF_120-219_0_0), IIIaS
Only few and small (primarily <10m) vessels are involved in this fishery and the total volume of landing is small (141 tonnes in 2010). The fishery is at the same time diverse (different vessels targeting different species) with a seasonal component (different species targeted different time of the year). The vessels are small and the sampling programme carried out is a self sampling programme where the fishermen bring the discards ashore. It is however logistically complex (relatively long travels to measure few fish) and sometimes fishermen forget to bring all the discarded fish to the harbour. This is the main reason to the failure to achieve what was planned. Due to the diversity in the fishery and the limited extent it is however unrealistic to assume that Sweden will gain reliable extra information from a sampling programme compared to the information already available in the official statistics within a reasonable cost. Sweden has asked for a derogation to sample this fishery in the National Programme 2011.

Trawl fisheries targeting small pelagic fish (PTM_SPF_32-69_0_0), IIIa
77 out of planned 108 trips were sampled by buying unsorted samples of landings in the harbours/markets. The assumption for the planned number of trips is that the fishery is conducted all year around in both Kattegat and Skagerrak. A main reason for the deviation is that the fishery was limited in Kattegat (IIIaS) especially during the second and third quarter. The overall number of conducted trips by the fleet has further decreased (table III.C.3) considerably compared to the reference years.

III.C.2 Data quality: results and deviation from NP proposal

Sweden initiated in 2009 a work to improve the designs of the metier sampling programmes taking the outcomes of WKACCU and WKMERGE into account. This work continued in 2010 and includes identification of proper sampling frames and probability based ways to select primary sampling units. At the same time we are trying to sort out some of the logistical problems that arise from the new more statistically sound sampling designs. The new designs will improve the possibilities to evaluate possible bias and thereby also accuracy. Sweden has for a number of years been waiting for the outcome of the COST project to get tools for estimation of quality indicators such as CVs. During 2009 Sweden started to work with the tools provided in order to i) investigate if and where the tools can be used to evaluate the Swedish data and ii) evaluate the Swedish sampling wherever possible. Also this work continued in 2010. Unfortunately it became evident that the COST tools were not suitable for the Swedish sampling design (at least not directly) in many cases. This means that the evaluation on if and how the COST tools could be used is an ongoing work and the analysis have not been finalised yet. Meantime, and for the sake of the annual report, Sweden have calculated mCVs for *length frequencies* of different species and stocks (table III.C.5). Details regarding the estimation of precision (mCV) are presented in Annex Ia and the results reported in Table III.C.5. Overall the required precision target for length compositions was fulfilled. The COST tools have been used to estimate CVs for *volumes* of discards (table III.C.5) were appropriate.

III.C.3 Follow-up of regional and international recommendations

Source	Recommendation	Action
RCM NS & EA (2010)	*The RCM NS & EA considers that in a situation where sampling resources are limited, priority should be given to the sampling*	SWEDEN WILL PARTICIPATE IN THE ICES PG FOR DISCARDS

	of discards in those metiers with high discarding. The information required is an estimate of the level of discarding (volume and percentage) and the main species contributing to the discard fraction of the catch. MS to prepare information on level of discarding in national metiers collected in recent years to be presented at a dedicated workshop to be defined.	(SGPIDS) AND WILL DELIVER DATA AND INFORMATION ON REQUEST.
RCM NS & EA (2010)	*The RCM NS & EA recommends that OTB_DEF_>=120_0_0 and TBB_DEF_70-99_0_0 are used as case studies for North Sea region in the ICES WKEID. The RCM NS & EA further recommends MS to submit data to ICES WKEID*	SWEDEN SUBMITTED THE REQUESTED DATA TO WKEID
RCM NS & EA (2009)	*RCM NS&EA recommends Sweden and Denmark to explore whether the discrepancy identified between the Swedish and Danish métier definition of vessels operating in Div. IIIa have any effect on the raising of the input data during HAWG and to provide a definition of the métier exploiting the herring stock in IIIa.*	SWEDEN HAS SUBMITTED A WD TO THE ASS WG IN 2007 WHICH SHOWED NO DISCREPANCY BETWEEN THE METIERS IN THE SWEDISH FISHERY.
RCM NS & EA (2009)	*For the purposes of ranking métiers to sample, National data on effort, landings and value by métier and fishing ground should be compiled regionally in advance of the next meeting. To enable this, participants from MS should strictly respect the agreed naming conventions of fishing ground, métiers and units of the variables as well as the deadline for submission of the national data.*	SWEDEN WILL USE THE AGREED NAMING OF FISHING GROUND, METIERS AND UNITS OF THE VARIABLES AS WELL AS RESPECT THE DEADLINE
RCM NS & EA (2009)	*For the purposes of regional understanding of sampling activities, National information on sampling should be compiled regionally in advance of the next meeting. To enable this, participants from MS should strictly respect the agreed naming conventions of fishing ground and métiers as well as the deadline for submission of the data.*	SEE ABOVE
RCM NS & EA (2009)	*For the purposes of understanding the heterogeneity of métiers an the consequences for task sharing and discard sampling, national descriptions of the regionally ranked métiers should be compiled using the format in annex 9. To enable this, participants from the MS should strictly respect the agreed naming conventions of fishing ground and métiers as well as the deadline for submission of the information. Appointed persons are responsible for requesting the data and compiling it on a regional level*	SWEDEN WILL PRODUCE THE DESCRIPTION OF THE METIERS USING THE FORMAT IN ANNEX 3 BEFORE THE RCM 2010.
RCM NS & EA (2009)	*MS to use the average landing figures over the years 2007-2008 as the basis for ranking métiers within the NP 2011-2013*	DONE
RCM NS & EA (2008)	***In the NP proposals, a short description of all métiers selected by the 90% ranking procedure should be provided. Such a table would enable RCM to identify whether a métier with the same name covers the same or different fisheries in different NPs.***	SE HAS ALREADY INCLUDED A SHORT DESCRIPTION OF ALL METIERS IN PROGRAMME FOR 2009-2010.
RCM North Sea & East Arctic (2007)	***THE RCM NS&EA RECOMMENDS THAT, AT A TRIP LEVEL, OR AT A FISHING OPERATION LEVEL WHEN POSSIBLE, THE RETAINED PART OF THE CATCH SHOULD BE CLASSIFIED BY TARGET ASSEMBLAGE (CRUSTACEANS, CEPHALOPODS, DEMERSAL,…) AND SORTED BY WEIGHT (BY TOTAL VALUE IN THE CASE OF VALUABLE CRUSTACEAN SPECIES, E.G. NEPHROPS). THE TARGET ASSEMBLAGE THAT COMES UP AT THE FIRST POSITION SHOULD BE CONSIDERED AS THE TARGET ASSEMBLAGE TO REPORT IN THE MATRIX. THE RCM NS&EA UNDERSTANDS THAT THIS WAY OF DOING DOES NOT ALLOCATE ANY INFORMATION TO THE MÉTIERS TARGETING MIXED TARGET ASSEMBLAGES.***	SE WILL REPORT FISHING ACTIVITY DATA IN THE FLEET-FISHERY MATRIX ACCORDING TO THE RECOMMENDATIONS MADE.
RCM North Sea & East Arctic (2007)	***THE RCM NS&EA RECOMMENDS THAT IN GENERAL IF AN AREA IS COVERED BY ONE DEDICATED TRIP PER YEAR ONLY, THE EFFORT PUT INTO THIS SINGLE TRIP COULD BETTER BE ALLOCATED TO OTHER FLEET SEGMENTS ENSURING BETTER***	SE WILL CONTRIBUTE WITH THIS INFORMATION.

	COVERAGE OF THESE SEGMENTS. *THE RCM FURTHER RECOMMENDS UPDATING THE LIST OF ONBOARD OBSERVER TRIPS BY FISHING ACTIVITY ON LEVEL 6 BEFORE THE NEXT MEETING.*	

III.C.4 Actions to avoid shortfalls

One of the main reasons for inconsistencies between planned no of trips to be sampled and what is achieved is that it is sometimes is difficult to predict spatial and temporal fishing patterns for some metiers at the time of writing the National Programme. To some degree this is inherent to the time lag between the compilation of the National Programme and the sampling year. To a certain degree the problem can be reduced by implementation of proper (and robust) sampling frames where the metiers can be seen as domains instead of strata. This is something that Sweden is working on and will continue to work on the forth coming years. Sweden will further continue to develop the sampling designs in order to reduce some of the logistical problems that have risen after implementing a more random selection of trips to sample.

III.D Biological - Recreational fisheries

THE BALTIC SEA

III.D.1 Achievements: results and deviation from NP proposal

For the Baltic Sea, salmon and cod are reported while recreational fishery for eel is not allowed according to regulation (FIFS 2004:36) in Sweden and therefore no data has been collected.

National mail screening surveys
There has been no national mail screening survey in Sweden since 2009 (which covered recreational fisheries in 2008). A new national mail screening survey is carried out during spring 2011 regarding recreational fisheries 2010. No deviations from the NP proposal.

Salmon
Swedish recreational salmon fishery in the Baltic takes place in rivers, at the coast and in the sea. The estimates of recreational catches at the coast and in the sea in 2009 utilized results from a pilot study (Anon. 2003) and updated information collected in 2007. Collection of river data is carried out annually in accordance with routines described in the pilot study.
Summarized data are delivered to the relevant ICES group (WGBAST). There is also a sampling of the biological parameters (length, weight, age, sex) in the fishery and as no separate reporting tables are provided for recreational fisheries the results are included in Table III.C.5 and III.E.3. No deviations from the NP proposal.

Cod
In the Swedish national surveys it has been shown that 50% of all the cod taken in the recreational Swedish fisheries originates from fishing in Öresund (ICES division 23). In the Swedish and also in the Danish recreational fishery it is estimated that a large part of the catches in this area is taken by the charter vessels which have recreational fishers as paying guests. The peak season for the recreational cod fishery is the first quarter of the year. A pilot survey on the charter vessels operating in the Sound 2010 was set up to get another source of information and to be able to make cross-checking against the national mail screening survey. The pilot study is in this context in accordance with Commission Decision (2010/93/EC) Chapter II B (1). From a scientific point, the cod fishery in this area is highly important as it might influence the spawning stock of the western Baltic cod stock.

In the pilot survey directed towards charter vessels in the Sound one captain on a charter vessel reported information on number of recreational fishermen onboard and amount of cod caught on a daily basis (in a questionnaire). The information put in the daily questionnaire has been compared with the information put on the website in the vessel´s daily blog. There are in total 10 Swedish charter vessels operating in the area and information from their blogs on fishing effort and cod catches has been compared with the catches reported in the questionnaires. From these data sources the total catches of cod caught by charter vessels in the Sound has been calculated. The results indicate that the catches were 40 – 80 tons during 2010.

III.D.2 Data quality: results and deviation from NP proposal

Salmon
A survey directed towards recreational salmon fishermen was carried out in a large northern salmon river. The result from this survey gives further information of the need for annual surveys and closer collaboration with organisations that are managing the fishery in this and other similar organised rivers. There are no deviations from NP proposals.

Cod
In the pilot survey, only one out of ten charter vessel was actively taken part in the survey. Due to the information put on the web site from all vessels it has been possible to raise the catch figures and estimate the total catch.
No deviations from the NP proposal.

III.D.3 Follow-up of regional and international recommendations

Source	**Recommendation**	**Action**
RCM Baltic 2010	1.Investigate the potential to coordinate recreational fisheries cod catches in SD 22-24 between Denmark, Germany and Sweden 2.Discuss the possibility to include recreational fisheries data into FishFrame 3.Compile 1-page status report of ongoing recreational fisheries surveys 4.Provide guidance how often recreational fisheries surveys need to be conducted RCM Baltic endorses to use annual weight estimates	SE PARTICIPATED IN THE MEETING WERE THESE ISSUES WERE DISCUSSED AND DEALT WITH
RCM Baltic (2008)	***The RCM Baltic recommends that MS follow the request for preparation of the WKSMRF (Workshop on Sampling Methods for Recreational Fisheries), given in the ICES resolution (see http://www.ices.dk/iceswork/recs/2008recs.asp).***	SE WILL PARTICIPATE IN WK AND ACTIONS WILL BE TAKEN AS RECOMMENDED

III.D.4 Actions to avoid shortfalls

National mail screening surveys
A new national mail screening survey is carried out during spring 2011 regarding recreational fisheries 2010. The design of the survey has been changed compared to earlier surveys in order to get a better coverage of active recreational fishermen .

Salmon
There is a plan to carry out better designed and larger surveys to improve the poor quality of the catch data in some rivers. Information of recreational catches at the coast will be updated in 2011.

Cod
A survey including all charter vessels operating in the Sound will be carried out during 2011. The national mail screening survey 2011 contains new questions about recreational fisheries from charter vessels in the Sound. The results from the national mail screening survey will be used as a cross-check and compared with the above studies on the charter vessels in the Sound. If the results are similar we may accept the national mail screening survey data on cod catches from charter vessels and also from small boats and the shore in the Baltic Sea.

THE NORTH SEA AND EAST ARCTIC

III.D.1 Achievements: results and deviation from NP proposal

For the North Sea only cod are to be reported while recreational fishery for eel is not allowed according to regulation (FIFS 2004:36) in Sweden and therefore no data has been collected.

National mail screening surveys
There has been no national mail screening survey in Sweden since 2009 (which covered recreational fisheries in 2008). A new national mail screening survey is carried out during spring 2011 regarding recreational fisheries 2010. No deviations from the NP proposal.

III.D.2 Data quality: results and deviation from NP proposal

No data to be reported. No deviation from NP proposal

III.D.3 Follow-up of regional and international recommendations

Source	Recommendation	Action
RCM NS & EA (2009)	*RCM NS&EA recommends MS to provide an overview of their inland sampling of the recreational fishery on eel.*	SWEDEN WILL PROVIDE OVERVIEW OF INLAND SAMPLING (TEMPORAL, SPATIAL, DISTRIBUTION, SAMPLING INTENSITIES, INVOLVED INSTITUTES) TO THE RCM MEETING IN 2010

III.D.4 Actions to avoid shortfalls

No shortfalls to be reported and therefore no actions to be taken.

III.E Biological - stock-related variables

THE BALTIC SEA

III.E.1 Achievements: results and deviation from NP proposal

All stocks sampled during 2010 for biological variables, age, length, weight, sex and sexual maturity are listed in table III.E.3. The variables are collected from different sources like survey, market or sea sampling and different sampling strategy has been used. For most stocks, the sampling sources are listed separately in order to keep track on the contribution of the different sources to the total.

To get catch-in-numbers (CANUM) and weight-in-catch (WECA) by age group, sampling of the landings is undertaken. Simple random sampling was used for pelagic stocks, cod, eel and flounder. The simple random sampling means that a fixed number of individuals were sampled randomly within market size category (if sorted) /unit (unit =area, quarter and gear) independent of landing size. All individuals in a sample were analyzed according to length, weight and age. For cod, extra length measurements are collected for each fishery (5 boats / sampling unit). The reason to add extra length measurements to the simple random sampling design is to get age-dis-aggregated information from three fisheries without increasing the number of age samples further.
Sampling strategy on surveys and onboard fishing vessels differs from market sampling and was performed as follows: all individuals (or a sub sample) were length measured and a fixed number per length class was sampled for age, sex, maturity and weight. For stocks sampled on surveys and onboard fishing vessels, the length can be given an age by using an Age-Length-Key.

International survey manuals give guidelines on number of individuals / length class to be sampled for age, sex and maturity. These were followed and the actual sampled number is therefore dependent on the amount of catch. In table III.E.3 planned numbers has therefore been market as NA.

Samples of herring and sprat were collected by Denmark according to the bilateral agreements and number of individuals collected is included in table III.E.3.

Sampling of eel in freshwater:

Fyke net fisheries (FYK_CAT_0_0_0) in inland (fresh) waters are targeting eel mostly in the (near) silver phase, and to a lesser extend in the yellow phase. This fishery is found in all major lakes (to a much lesser extend in smaller lakes and rivers) flowing into the Baltic and the Skagerak/Kattegat (North Sea) areas. Since all Swedish inland waters now belong to a single Eel Management Unit, and data will only be applied at the national scale, the sampling in inland waters will not be stratified spatially. Consequently, sampling inland waters will only be described in full under this section.

Landings in inland waters are just over 100 t. By-catch and discards in this fishery occurs, but this does rarely involve species under international management. Sampling is therefore concentrated on eel only, i.e. Scheme 2/3, with 100% of samples focused on Group 1 species. Our approach has been to collect six (6) samples of 125 (5*25 cm-classes) eels each for length, weight, life-stage (yellow, half-silver and silver) and sex. That sums up to 750 eels per year. The proportion of males in Swedish freshwaters is close to nil, thus they are not considered as significant in this context. As this fishery targets mainly silver eels we have not considered separate samples for the very few yellow eels landed. Sampling once a year during peak season in each lake seems appropriate at this stage to explore the spatial variation. All eels are aged and as a matter of practicality, weight, sex and maturity are measured in all eels at the same time. As spawner quality issues have been raised by EIFAC/ICES WGEEL we include our routine analysis of prevalence and intensity of the swim-bladder parasite *Anguillicoides crassus* in this programme.

A total of 750 silver eels were planned to be sampled in 2010 and subsequently analysed with regard to length, weight, sex, maturity stage (silver index), age (growth) and infestation rate (prevalence and intensity) of the swim-bladder parasite *Anguillicoloides crassus*. Silver eels were to be taken from the peak season in the pound net fisheries in four lakes. From each of two of these lakes, 125 eels were sampled. The remaining two lakes are quite complex and were thus represented by samples from two sites each, i.e. in total six samples. The lakes chosen as representatives for the whole commercial fishery for eel in freshwater were Vänern, Mälaren, Hjälmaren and Ringsjön. The first three lakes were chosen because of their importance and the extent of the fishery. Lake Ringsjön was chosen as a representative for eel fisheries in "smaller/remaining lakes".

Sampling of Salmon (Salmo salar) SD 25,26, 30 & 31:

Sampling of the commercial salmon catches, and additionally caught sea trout, in the coastal métier (FPO_ANA_0_0_0) was carried out in the Gulf of Bothnia (ICES sub-divisions 30-31). Collected data include length, weight and sex of individual fish. Scales are collected from all fish in the samples to determine age, wild or reared origin as well as use in genetic studies.

Sampling of the recreational salmon and sea trout catches was carried out during the fishing season in two rivers in the Gulf of Bothnia and one river in the Main Basin. The monitored variables include smolt age, sea-age, sex, origin (wild/reared) and size at capture (weight and length). These data are an integral part of the assessment of the spawning run composition and the effects of the fishery. Data on fecundity was collected by a recreational brood stock fishery in River Dalälven, Sub-division 30.

Sampling of the commercial salmon catches, and additionally caught sea trout, in the off shore métier (LLD_ANA_0_0_0) was carried out in the main Baltic (ICES sub-division 25-26). Fish were sampled at landing in harbours and carried out by SBF personal. All fish sampled included collection of scales, length and weight of individual fish. Since all individuals of salmon and trout were gutted off shore, collection of data on sex was not possible.

River monitoring of wild salmon and sea trout stocks
In 2006-2008 river monitoring of Swedish wild salmon stocks was included in the NP. The monitoring consisted of annual electrofishing surveys of salmon and sea trout parr in wild salmon rivers, running of a smolt trap for emigrating smolts and maintaining counting of ascending salmon and sea trout spawners in fishladders in three rivers. In the new Commission Regulation valid for 2009-10, it is stated that countries should establish salmon index rivers, as defined by ICES, for counting of smolts, numbers of ascending spawners and estimating densities of parr. Because Sweden has a major part of the Baltic salmon rivers, this had major implications for the Swedish monitoring system. In line with ICES-definitions Sweden established three index rivers - two in Gulf of Bothnia (Rivers Vindelälven and, Sävarån) and one in the Main Basin (River Mörrumsån), instead of the partial small index river in use earlier (Sävarån).

Establishment of index rivers is normally associated with major costs, because basic facilities are needed for the counting activities, but also because costs for running these investigations are substantial. In order to handle the new demands it was necessary to decrease the amount of monitoring in other non-index rivers. Furthermore SBF co-operates with other bodies, both private companies and regional and local agencies and local organizations as well as the Swedish University of Agriculture (SLU). These bodies are used as subcontractors and they also contribute with considerable amounts of money to the index river projects. The Swedish Board of Fisheries is responsible for project management, and in some cases also detailed planning and reporting of results. These projects are seen as important parts of a new salmon management plan that is expected to replace the old SAP plan (1997-2010). As the Board of Fisheries will not own any of the investments in fishladders, it will be considered as subcontracting costs.

The result for index rivers in 2010 is as described in the text table below.

River	Smolt count	Adult count	Electro-fishing
Ume/Vindelalven, Sub-div. 31, a large river	Smolt trap operated	New built fishladder used in 2010	Yes
Sävarån, Sub-div. 31, a small river	Smolt trap operated	Not in 2009 or 2010 (pilot study using sonar in 2010)	Yes
Mörrumsån, Sub-div. 25, midsize river	Smolt trap operated	Use of existing fishladder with , improvement (camera) in 2010	Yes

In addition to the monitoring of the index rivers, operation of a fishladder in River Kalixälven and electrofishing is included in the NP. All data from electrofishing survey are collected in a national database covering all Swedish surveys (SERS). Other data are also collected and kept in a database that is partly operated by the Swedish Board of Fisheries. It is expected that it will take about two years to get all datasets in order. All data from river monitoring are reported to the relevant ICES Working Group (WGBAST).

Deviations in sampling:

Eel (*Anguilla anguilla*) freshwater
Due to unforeseen complications one selected commercial eel fisherman was not able to deliver any eels from his lake.

Herring (*Clupea harengus*) sd 22-24
Only a few Swedish vessels are actively fishing in the area and most of the landings take place during night time which reduces the sampling opportunities. Also, some landings are delivered straight to purchaser, with the consequence that no sampling could be performed. Staff from the control department was involved in the collection of samples, but their building was ruined by a fire and samples collected in quarter 1 and 2 were destroyed.

Herring *(Clupea harengus)* sd30-31
Herring samples from gillnet fisheries in SD 31 are under-sampled for age due to lack of 2 fishing trips. Due to problems with collecting the fish samples the achieved number ended up below planned numbers.

Cod *Gadus morhua* sd 22-24 and sd 25-32
In the sea sampling cod was over-sampled according to what was planned. In the sea sampling program it is the number of trips rather than number of individuals the sampling is planned for. Therefore number of individuals can end up lower or above the planned numbers. The planned number is just a mean value based on historical data. No extra cost is involved to receive the higher number of individuals.

Salmon *(Salmo salar)* sd22-32
The number of fish sampled by length at age and weight at age was 43% lower than planned. Number of fish sampled by sex-ratio at age was 56 % lower than planned. The reason was the very weak spawning migration in 2010, causing significantly reduced catches in both coastal commercial fishery (FPO_ANA_0_0_0) and river recreational fishery. Sex-ratio at age was not sampled in the commercial off-shore catch causing the reduced number of fish sampled in this variable.

Smolt traps operated successfully in Sävarån and Mörrumsån in 2010, whereas the fyke net in in Ume/Vindelälven could not be used as early as planned, because of extreme water levels (pronounced spring flood). Hence, a significant and unknown part of the smolt run was missed, resulting in an unrealistically low estimate.

Sprat (*Sprattus sprattus*) IIIb-d
While both herring and sprat is caught in the pelagic fishery, the plan is to collect both sprat and herring from the same samples. Even though number of samples follow the numbers planned, very few individuals of sprat appear in the samples and the planned level of individuals are not reached.

III.E.2 Data quality: results and deviation from NP proposal

During 2010, Sweden has worked intensively with the COST tool package, to evaluate and compare the output from COST with the traditional methods used in Sweden. Sweden also participated in the COST workshop in April 2010 to get a better knowledge in the statistical tool (ICES 2010). However, in COST there are still crucial parts missing and the tool cannot deal with some basic sampling strategies used in Sweden and other MS. A more detailed text on Swedish feedback on COST was written and sent to the Commission in September 2010.
So far, there has only been possible to use the COST tool for analysing CV for some parameters, also, COST has not been developed to deal with survey data Therefore, Sweden developed new R-scripts using boot-strap for calculating CV on length, weight, sex and maturity by age and the methods are described in Annex Ia and Ib. For surveys, only data collected during quarter one was included in the analyses.

In Annex Ia and Ib details regarding the estimation of precision (mCV) reported in Table III.E.3 for Baltic herring, cod, sprat, flounder, eel and salmon are presented. For these species, the required precision target (CV) was well fulfilled for the variable "Length at age" and when applicable, likewise for the variable "Maturity at age". However for the variable "Weight at age" the estimated CV values did not reach required target and the deficient results can be explained by the huge variation in weight, i.e. condition of the sampled fish. Also, for some of the sampling units, the number of sampled individuals was lower than planned, which might have had a negative impact on the results. The precision target was not either reached for the variable "Sex-ratio at age" when applicable, a possible explanation might be that the sampling is done without taking the impact of spawning season in consideration.

As 2010 was the first sampling year for eel in fresh-water no calculations on achieved precision target (CV) have yet been undertaken. In 2011 large numbers of eel will be measured at each of the six sites representing the commercial fishery for eel in freshwater to facilitate estimates of CV.

It is of great importance to further develop the COST tool to establish a harmonised way for analysing the quality of the data. Sweden welcomes any initiatives to continue the development of COST and support the discussion to find ways to develop and maintain the tool further.

III.E.3 Follow-up of regional and international recommendations

Source	Recommendation	Action
RCM Baltic 2010	In order to be able to analyse the current sampling level of sprat in the Baltic and suggest optimal sampling levels for future regional coordinated sampling, the data must be available in an agreed format and checked for errors. Data has to be uploac in Fishframe	SWEDEN HAS UPLOADED THE REQUESTED DATA INTO FF.
RCM Baltic	*In order to use the time of the RCM more efficient a for the harmonisation of the NPs, including the*	SWEDEN IS RESPONSIBLE FOR COMPILING THE DATA FROM ALL MS TO BE USED IN RCM 2010.

(2009)	*quality checks, the exchange data tables from all NPs, namely planned number of individuals to be sampled for age, length, weight, sex and maturity should be compiled before the next RCM.*	
RCM Baltic (2009)	*MS to use the average landing figures over the years 2007-2008 as the basis for ranking métiers within the NP 2011-2013*	DONE
RCM Baltic (2008)	***Member states are recommended to seek for task sharing when starting ageing new species .***	SE WILL SEEK FOR TASK SHARING IN THESE CASES
RCM Baltic (2006)	***THE RCM BALTIC RECOMMENDS THAT FINLAND AND SWEDEN WILL EVALUATE THE COLLECTION OF BIOLOGICAL DATA OF THE HERRING FISHERY IN THE GULF OF BOTHNIA IN ORDER TO ELABORATE CONGRUENT PROCEDURES. THE POSSIBILITIES TO HARMONIZE THE COLLECTION OF CORRESPONDING ECONOMIC DATA SHOULD BE EVALUATED.***	IN 2007 FINLAND AND SWEDEN HAVE CONDUCTED INTERCALIBRATION IN BOTH AGE READING (COMPARING METHODS) AND MATURITY STAGING OF HERRING. HARMONIZATION OF SAMPLING METHODS ARE UNDER DISCUSSION. IMPROVEMENT OF ALL ASPECTS REGARDING THE JOINT ACOUSTIC SURVEY IN SD30 ARE ALSO DISCUSSED AND A MEETING IN END OF MAY 2008 IS PLANNED FOR SUCH DISCUSSIONS. HOWEVER IT IS A GOAL OF SWEDEN TO CONTINUE THE WORK ON HARMONIZING BOTH THE BIOLOGICAL AND ECONOMICAL COLLECTION OF DATA.
RCM Baltic (Jan 2005)	***3.2 BALTIC RCM RECOMMENDS IN CASE WHERE MORE THAN 5 PERCENT OF THE NATIONAL QUOTA IS LANDED IN A FOREIGN COUNTRY, BILATERAL AGREEMENTS SHOULD BE MADE.***	BILATERAL AGREEMENTS HAS BEEN DONE YEARLY. AND FOR 2005 THIS WAS DONE BETWEEN SWEDEN AND DENMARK IN JANUARY 2005 AND SWEDEN AND GERMANY IN MAY 2005.
RCM Baltic (Jan 2005)	***5.1 THE RCM RECOMMEND THAT BOTH EASTERN AND WESTERN BALTIC COD, OTOLITHS WEIGHT SHOULD ON A ROUTINE BASIS BE COLLECTED AS A COMPLEMENT TO AGE READING. THIS MUST START FROM 2005.***	SWEDEN IS RECORDING WEIGHT ON COD OTOLITHS ON A ROUTINE BASIS.
RCM Baltic (Jan 2005)	***6.1 THE RCM RECOMMENDS THAT SAMPLING SHOULD BE CARRIED OUT THROUGH OUT THE ENTIRE TRI ANNUAL PERIOD.***	SWEDEN IS SAMPLING DATA ON OTHER BIOLOGICAL PARAMETERS EVERY YEAR.

III.E.4 Actions to avoid shortfalls

Eel (*Anguilla anguilla*) in freshwater
In order to minimise the risk of missing eel samples from some sites an even more intense contact with the fishermen involved will be prioritised.

Herring (*Clupea harrengus*) in sd 22-24
Staff from the control department will be more heavily involved in the collection of samples and will find new ways / change the routines to get the herring samples (sampling direct at purchaser has started in 2011 with success).

Herring (*Clupea harrengus*) sd 30-31
To achieve planned number of samples it requires 20 age samples per 0,5 cm-class. Moreover, to secure that all planned sampling of herring will be carried out, the whole sampling process will be evaluated and necessary alternations made.

Salmon (*Salmo salar*)
Several actions are taken to remedy wide confidence intervals for results from smolt trapping. This includes better coverage of the entire migration season, education of more personnel and development of trapping methods.
If the coastal and river catch remains at low number due to poor spawning migrations in 2011, actions to increase sampling intensity have to be considered. Number of samples collected from the off shore fishery will be increased in 2011.

Sprat (*Sprattus sprattus*) IIIb-d
While too few individuals of sprat appear in the planned number of samples, new ways of collecting sprat are discussed and looked for.

THE NORTH SEA AND EAST ARCTIC

III.E.1 Achievements: results and deviation from NP proposal

All stocks sampled during 2010 for biological variables, age, length, weight, sex and sexual maturity are listed in table III.E.3. The variables are collected from different sources like survey, market or sea sampling and different sampling strategy has been used. For most stocks, the sampling sources are listed separately in order to keep track on the contribution of the different sources to the total.

To get catch-in-numbers (CANUM) and weight-in-catch (WECA) by age group, sampling of the landings is undertaken. Simple random sampling was used for pelagic stocks herring and sprat, cod, eel and witch flounder. The simple random sampling means that a fixed number of individuals were sampled randomly within market size category (if sorted) /unit (unit =area, quarter and gear) independent of landing size. All individuals in a sample were analyzed according to length, weight and age. For species landed ungutted also sex and maturity was sampled. For nephrops and pandalus no information on age is collected

Sampling strategy on surveys and onboard fishing vessels differs from market sampling and was performed as follows: all individuals (or a sub sample) were length measured and a fixed number per length class was sampled for age, sex, maturity and weight. For stocks sampled on surveys and onboard fishing vessels, the length can be given an age by using an Age-Length-Key.

International survey manuals give guidelines on number of individuals / length class to be sampled for age, sex and maturity. These were followed and the actual sampled number is therefore dependent on the amount of catch. In table III.E.3 planned numbers has therefore been market as NA.

Deviations in sampling:

Herring (*Clupea harengus*) IIIa
Sampling of herring is planned to take place in both Kattegat and Skagerrak (650 individuals /quarter and area). In Skagerrak, fishing and sampling was taken place in all quarters (slightly more than 650/q). In Kattegat, no fishing and consequently no sampling was taken place in quarter 2. For quarter 3 and 4 less than 650 individuals were sampled due to occasional landings of large catches and lack of cooperation with one landing site.

Cod (*Gadus morhua*) IIIaS
Sampling was performed in all quarters but due to very low landings during 2010 (in total 38 tonnes) planned sampling level was simply not possible to reach. Moreover, in quarter 1 ice cover prevented fishing and consequently sampling of cod

For cod collected in the sea sampling programs, number of trips rather than number of individuals are the levels to be achieved. That explains both the under sampling (IIIa S) and the over sampling (IIIa N) of cod which is received without extra cost.

Witch flounder (*Glyptocephalus cynoglossus*) IIIa
Sampling on sex and maturity was planned to be performed on individuals sampled during surveys. Instead we bought ungutted witch flounder from which age, weight as well as sex and maturity could be analysed from the same individuals. Therefore, the data on sex and maturity was doubled compared to what was planned and the information was gained without extra costs.

Norway lobster (*Nephrops norvegicus*) IIIaN
In 2010 there was ice coverage during quarter 1 and 4 preventing the vessels to leave the harbour. In quarter 4 there was also a long period of bad weather conditions and therefore no fishing and sampling was taken place. As a consequence of this, total number of individuals sampled did not reach the planned level.

Plaice (*Pleuronectes platessa*) IIIa
No sampling of the landings is performed by Sweden according to the bilateral agreement with Denmark. Sampling of plaice is still undertaken onboard fishing vessels in the sea sampling program and age is collected for the discard part only. This change in sampling level was not set while the NP was written and therefore achieved number ended up to be below planned numbers.

Sprat (*Sprattus sprattus*) IIIa
Sampling was planned to be performed in quarter 1 and 4 (500 individuals per quarter). Fishing was taken place only in quarter 4 and therefore only half of the planned numbers of individuals were sampled.

III.E.2 Data quality: results and deviation from NP proposal

During 2010, Sweden worked intensively with the COST tool package, to evaluate and compare the output from COST with the traditional methods used in Sweden. Sweden also participated in the COST workshop in April 2010 to get a better knowledge in the statistical tool. However, in COST there are still crucial parts missing and the tool cannot deal with some basic sampling strategies used in Sweden and other MS. A more detailed text on Swedish feedback on COST was written and sent to the Commission in September 2010.
So far, there has only been possible to use the COST tool for analysing CV for some parameters, also, COST has not been developed to deal with survey data Therefore, Sweden developed new R-scripts using boot-strap for calculating CV on length, weight, sex and maturity by age and the methods are described in Annex Ia and Ib. For surveys, only data collected during quarter one was included in the analyses.

In Annex Ia and Ib, details regarding the estimation of precision (mCV) reported in Table III.E.3 for eel, herring, cod, plaice, witch flounder and sprat are presented. For these species, the required precision target (CV) was well fulfilled for the variable “Length at age” and when applicable, for the variable “Maturity at age” for most of the species. However for the variable “Weight at age” the estimated CV values did not reach required target and the deficient results can be explained by the huge variation in weight of the sampled fish. The precision target was not either reached for the variable “Sex-ratio at age”.

The CV script used was designed to handle age disaggregated data and therefore no CV was calculated for Nephrops and Pandalus which is not based on age. This will be taken care of in the near future.

It is of great importance to further develop the COST tool to establish a harmonised way for analysing the quality of the data. Sweden welcomes any initiatives to continue the development of COST and support the discussion to find ways to develop and maintain the tool further.

III.E.3 Follow-up of regional and international recommendations

Source	Recommendation	Action
RCM NS & EA (2010)	*MS are asked to start using the tool COST for calculatio of CV for the Technical Report*	SWEDEN HAS PUT A LOT OF EFFORT IN ORDER TO START TO USE THE TOOL. STILL THERE ARE TOO MANY BUGS AND PARTS MISSING IN COST TO USE IT.
RCM NS & EA (2010)	*The RCM NS&EA recommends that relevant countries investigate the distribution of their landings from the named stocks in Table 12 in relation to the overall distribution across the stock area. Where they have no sampling plai for catches, they should consider if their component of t stock is adequately sampled, spatially and temporally by other MS.*	Mackerel (*Scomber scombrus*) IIIa and IV was picked out in table 12 for Sweden. Sweden do not plan to sample this stock while approximately 77 % of the Swedish landing is taken place in UK and 20 % in Norway.
RCM NS & EA (2009)	*In order to use the time of the RCM more efficient and fo the harmonisation of the NPs, including the quality checks, the exchange data tables from all NPs, namely planned number of individuals to be sampled for age, length, weight, sex and maturity should be compiled before the next RCM.*	SWEDEN IS RESPONSIBLE FOR COMPILING THE DATA FROM ALL MS TO BE USED IN RCM 2010.
RCM NS & EA (2008)	***Stock variables: Minimum required taxonomical levels for identification***	AFTER APPROVAL BY STECF, SE WILL ADOPT THE CHANGES
RCM NS & EA (2008)	**Stock variables: Group 3 on a higher taxonomical level**	AFTER APPROVAL BY STECF, SE WILL ADOPT THE CHANGES
RCM NS & EA (2008)	***Stock variables: Recommended changes in G-status***	AFTER APPROVAL BY STECF, SE WILL ADOPT THE CHANGES
RCM North Sea & East Arctic (2007)	***THE RCM NS&EA RECOMMENDS THAT ALL MS TAKE PART IN THE CASE STUDY ON SPATIAL ASPECTS ON GROWTH PATTERNS FOR NORTH SEA COD BY SUBMITTING DATA TO FRANCE USING THE TEMPLATE IN ANNEX 6.***	NO DATA HAS BEEN SENT.
RCM North Sea (2005)	***7.1 RCM NORTH SEA EXPECTS THAT ALL LABS WILL UPDATE THE SPREADSHEET WITH THEIR COD SAMPLING INFORMATION ON A MONTHLY BASIS.***	SWEDEN HAS NOT UPDATED THE SPREADSHEET.
RCM North Sea (2005)	***8.1 RCM NORTH SEA RECOMMENDS THAT ALL COUNTRIES HAVING DATA ON NS COD PARTICIPATE IN THE PROPOSED WORKSHOP ON FISHFRAME (CHAIR: HENRIK DEGEL, MID-JANUARY 2006, COPENHAGEN, DENMARK).***	SWEDEN WAS REPRESENTED BY ONE PARTICIPANT IN THE FISHFRAME WORKSHOP
RCM North Sea (2005)	***9.1 RCM NORTH SEA RECOMMENDED THAT DATA ARE SUBMITTED TO FISHFRAME, STARTING WITH THE 2004 AND 2005 DATA FOR NORTH SEA COD BEFORE 1 MAY 2006.***	DATA WILL BE DELIVERED BEFORE 1ST JUNE 2006.
RCM North Sea (2005)	***17.1 THE RCM NORTH SEA REITERATES ITS 2004 RECOMMENDATION ON THE CONCLUSION OF FORMAL BILATERAL AGREEMENTS ON THE SAMPLING OF FOREIGN FLAG VESSELS, AND ON THE INCLUSION OF THESE AGREEMENTS IN THE MS' NATIONAL PROGRAMME PROPOSALS.***	BILATERAL AGREEMENTS BETWEEN SWEDEN AND DENMARK AND SWEDEN AND GERMANY WERE UPDATED IN FIRST QUARTER OF 2006.

III.E.4 Actions to avoid shortfalls

<u>Herring (*Clupea harengus*) IIIa</u>
Better cooperation with vessels fishing in the Kattegat area is needed and has started in 2011 to collect samples directly from the vessels.

<u>Cod (*Gadus morhua*) IIIaS</u>
Sampling directly at the auction by the staff has in general been very successful and cost effective and Sweden will continue with the sampling setup.

<u>Norway lobster (Nephrops norvegicus) IIIaN</u>
While fishing for nephrops is highly dependant on good weather conditions, the sampling can just follow the fishing activity. Sweden plan to follow the fishing activity.

<u>Plaice (*Pleuronectes platessa*) IIIa</u>
Sweden and Denmark will continue to work according to the bilateral agreement and Sweden will not sample the landed part of the plaice.

<u>Sprat (Sprattus sprattus) IIIa</u>
Sweden plan to follow the fishing activity. In quarters with no fishing, consequently no sampling can be conducted.

III.F Transversal variables

III.F.1 Capacity

III.F.1.1 Achievements: results and deviation from NP proposal

No shortfalls and/or deviations exist in relation to what was stated in the national programme.

Capacity data was obtained from the fleet register. In order to segment the fleet logbooks and coastal journals was used to obtain the main gear type used. The dominance criteria to allocate each vessel to a segment were based on the number of fishing days used with each gear.

III.F.1.2 Data quality: results and deviation from NP proposal

No shortfalls and/or deviations exist in relation to what was stated in the national programme.

Capacity data was collected exhaustively in the fleet register (Database Fartyg 2).

III.F.2 Effort

III.F.2.1 Achievements: results and deviation from NP proposal

No shortfalls and/or deviations exist in relation to what was stated in the national programme.

Data was acquired as defined in Appendix VIII of the Commission decision 2010/93/EC. All spatial data used to calculate time in area for vessels reporting in logbook, was based on best information from VMS, AIS (where applicable), Effort reports, logbook and inspection information (sighting etc).

The spatial data was stored trip by trip with information for each record on vessel, position (long/lat), and time and data source. Information on activity and gear onboard was linked to each trip.

Vessel not obliged to keep logbook reported there effort information in the monthly coastal journal. Data on gear capacity and activity was collected as well as information on days at sea/fishing days. For simplicity reason calendar day was used instead of 24-hour periods for the calculation of activities of vessels under 8m/10m without logbook.

Effort calculation related to static gear did not include time in port since it was almost impossible to calculate with any precision. In small scale fisheries different vessels could be used for setting gears and collecting gears or collecting catch from gears. It is also possible that gears belonging to two different vessels (on territorial waters) is set by only one of the vessels and later collected by each vessel. In order to have conformity with management effort calculations, fishing days for static gears was calculated in accordance with management provisions for calculating effort for static gears. Thus, calculating of fishing days included time when a vessel was out of port with gears on board or in sea, without just being transiting.

Variable Data sources and methodologies	**Variable Data sources and methodologies**
Days at sea	Spatial data sources (described above) and coastal journals for vessels without logbook
Hours fished.	Effort data in logbook (haul by haul records) information
kW * Fishing Days	Fleet register and logbook/coastal journal
GT * Fishing days	Fleet register and logbook/coastal journal
Number of trips	Logbook/Coastal journal (gear information)
Number of rigs	Logbook/Coastal journal (gear information)
Number of fishing Operations	Logbook/Coastal journal
Number of nets, Length	Logbook/Coastal journal
Number of hooks, Number of lines	Logbook/Coastal journal
Numbers of pots, traps	Logbook/Coastal journal
Soaking time	Logbook/Coastal journal

III.F.2.2 Data quality: results and deviation from NP proposal

No shortfalls and/or deviations exist in relation to what was stated in the national programme.

Effort data derived from the same datasets used to monitor quotas and effort limitations. Comprehensive validations were made during the database entry process (logbook, landing declarations, sales notes, Coastal journals, effort reports). Spatial data from logbook, VMS, effort reports, sightings etc were compiled trip by trip. The trip information was crosschecked in order to verify catch and effort area information in the logbook and to calculate time in different effort areas. Cross-checking of effort information in the monthly coastal journals was not made on a trip by trip base and not on a regular base.

III.F.2.3 Follow-up of regional and international recommendations

No relevant recommendations have been made about the collection of effort data.

III.F.3 Landings

III.F.3.1 Achievements: results and deviation from NP proposal

No shortfalls and/or deviations exist in relation to what was stated in the national programme.

Data was acquired as defined in Appendix VIII of the Commission decision 2010/93/EC.

Variable Data sources and methodologies	Variable Data sources and methodologies
Value of landings total and per commercial species	Logbook/Landing declaration, Coastal Journal and salesnotes. Since all quantity in a landing does not necessarily end up in a salesnote, an average price for the species landed was used instead of the corresponding sales note. For monthly coastal journals an average for the month was used. The average prices were based on species, landing location and landing date.
Live Weight of landings total and per species	Logbook/Landing declaration and Coastal Journal. National conversion factors (same as for quota calculation) were used to calculate live weight from product weight.
Prices by commercial Species	Sales notes
Conversion factor per species	National conversion factors (same as for quota calculation) were used to calculate live weight from product weight.

III.F.3.2 Data quality: results and deviation from NP proposal

No shortfalls and/or deviations exist in relation to what was stated in the national programme.

Landing data derive from the same datasets used to monitor quotas. Comprehensive validations were made during the database entry process (logbook, landing declarations, sales notes, Coastal journals, effort reports). Catch, landing and sales data as well as spatial data from logbook, VMS, effort reports, etc was compiled trip by trip. The trip information was crosschecked in order to verify catch and catch area information in the logbook. Crosschecking of information in the monthly coastal journals was not made on a trip by trip base and not on a regular base.

III.F.3.3 Follow-up of regional and international recommendations

No related recommendations have been made about the collection of landings data.

III.G Research surveys at sea

III.G.1 Achievements: results and deviation from NP proposal

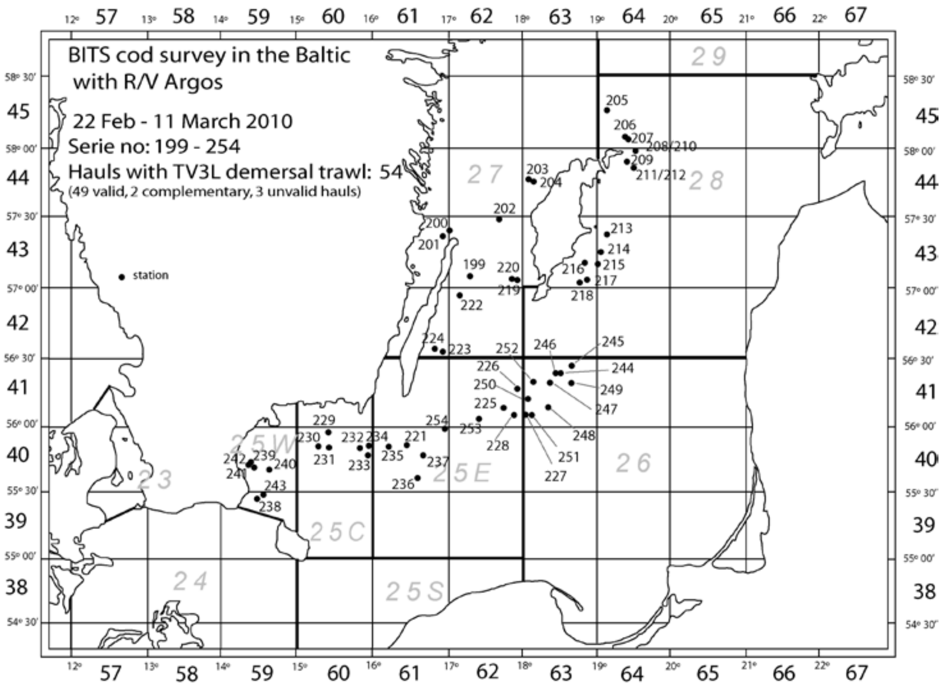
During 2010, Sweden has as planned undertaken five surveys in the Baltic Sea, Kattegat and Skagerrak using the R/V ARGOS. Sweden also participated as planned in the joint survey in area IIa. The new NTV survey in Skagerrak and Kattegat was undertaken for the first time during 2010.
A description of the different surveys undertaken in 2010 follows below and a summary is also presented in table III.G.1.

The Baltic International Trawl Survey (BITS) first and fourth quarter
The main aim of the survey is to estimate cod recruitment indices and cod abundance in the different Sub-Divisions in the Baltic. The BITS survey is coordinated by the ICES Baltic International Fish Survey Working Group (WGBIFS).

All Swedish survey data are stored in "Fish sample database" (IMR, Sweden) and sent to DATRAS for international data storage. The present surveys provide data to the ICES Baltic Fisheries Assessment Working Group (WGBFAS).

BITS first quarter
The survey was conducted during the period 22/2 - 11/3 using the TV3 demersal trawl according to the BITS manual (Anon., 2009). Overall, 54 fish hauls were made (including six fictitious hauls which were not trawled because the oxygen concentration close to the bottom was less than 1.5 ml/l) in SD 25, 26, 27 and 28 from the Tow Database and were completed within 15 days at sea (Map1).

Sweden was assigned 50 randomly selected hauls of which Argos realized 49. Three hauls in SD 26 were invalid due to trawl damage and only two of them could be replaced. In addition, two complementary hauls were realized during this survey. Almost all cod (totally 14 465) were measured and otoliths from 1 065 individuals were taken. From the catch of flounder (totally 7 234), otoliths were taken from 1 013 individuals. Overall, 21 fish species were caught during the survey and the catch was dominated by herring, cod, sprat and flounder.

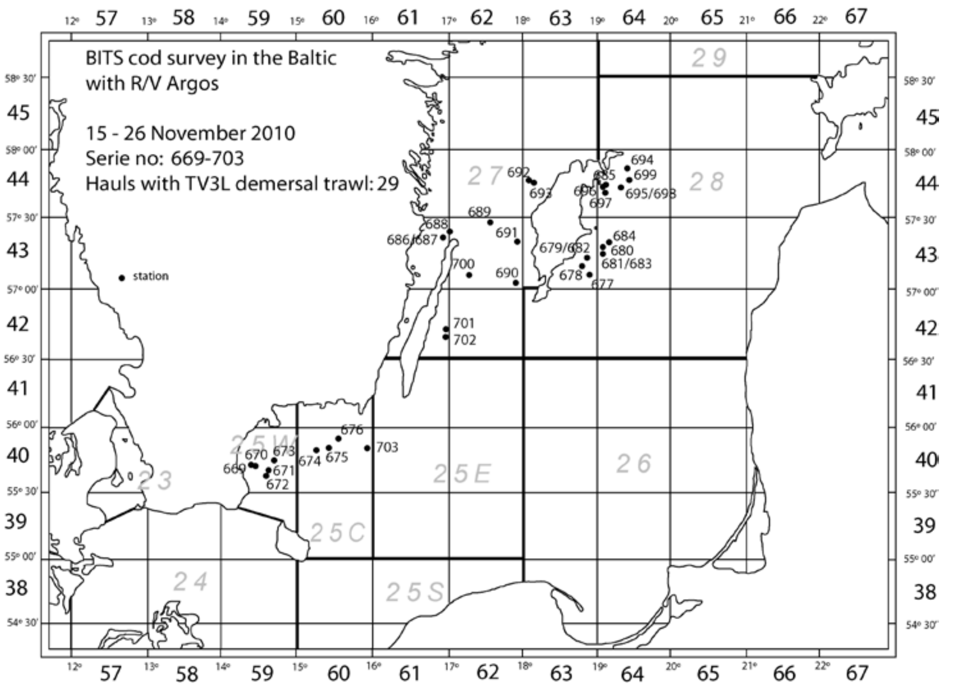


Map 1. Trawl stations BITS first quarter survey 2010.

BITS fourth quarter
The survey was conducted during the period 15 – 26/11 using the TV3 demersal trawl according to the BITS manual (Anon., 2010a). Sweden was assigned 31 randomly selected hauls in SD 25, 27 and 28 from the Tow Database. In total, 29 valid hauls were realized during this survey within 10 days at sea.

Overall, Argos made 30 hauls with TV3L demersal trawl (Map 2) (including five fictitious hauls which were not trawled due to oxygen concentration close to the bottom was less than 1.5 ml/l). One haul was invalid but could be replaced. Two stations were not possible to trawl due to bad weather conditions. During the whole survey, acoustic data were continuously recorded.

Of the 15 586 cod caught, a majority was measured and otoliths were taken from 708 individuals. Flounder, of which 5 862 were caught, was also analysed and otoliths were taken from 1 011 individuals. Overall, 21 fish species were caught in the Baltic during the survey and the catch was dominated by herring, cod, sprat and flounder.



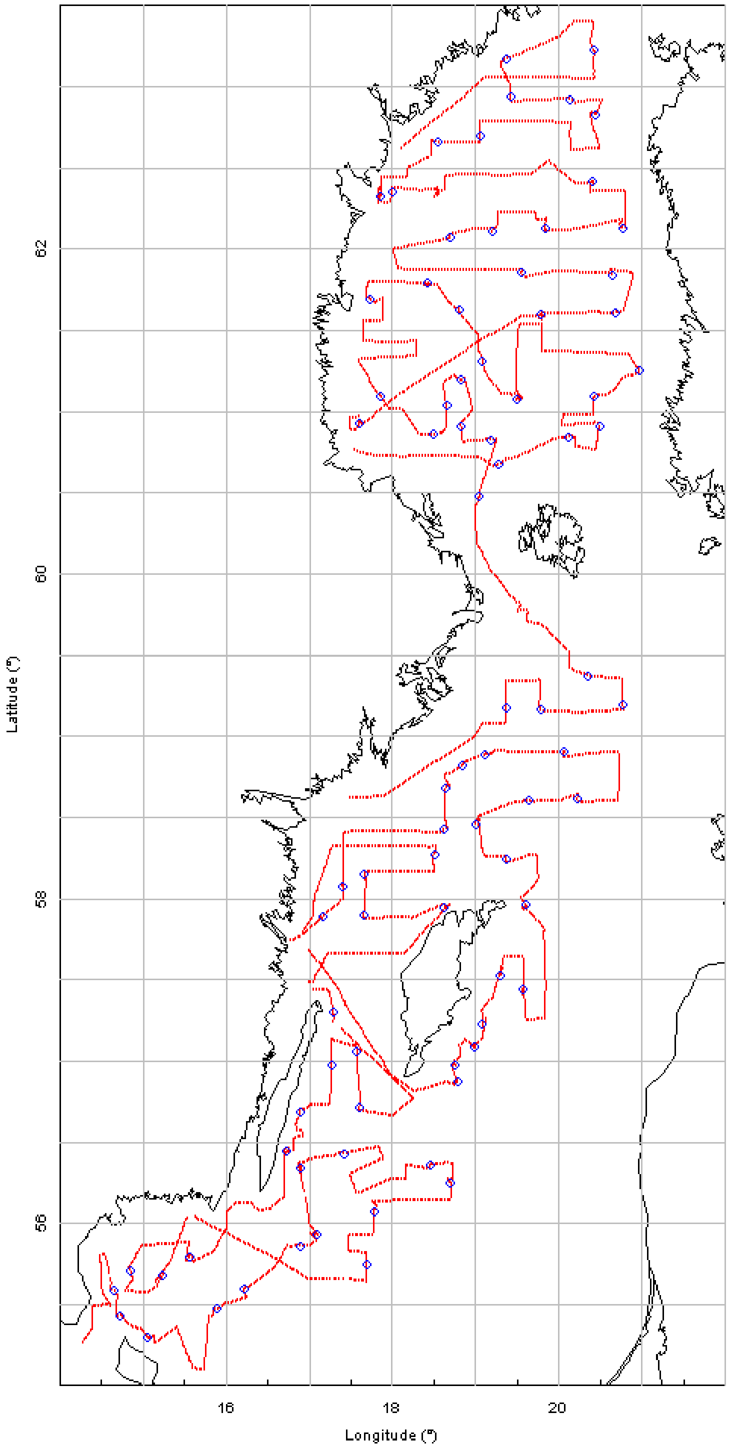
Map 2. Hauls with TV3L demersal trawl, BITS fourth quarter survey 2010

BIAS Baltic International Acoustic Survey

The main objective of the survey is to assess clupeoid resources in the Baltic Sea.

The R/V Argos cruise started 20/9 from Härnösand and ended 28/10 in Gothenburg. All trawl hauls were made using the Fotö Model 06 pelagic trawl with 6 mm mesh bar in the codend. In total 84 trawl hauls were carried out and the cruise covered ICES subdivision 27, 30 and parts of 25, 26, 28 and 29 (Map 3). Sweden follows the recommendations given by WGBIFS that states that the maximum sampling effort should preferably be used and therefore produces an age key by taking otoliths from each ICES rectangle covered by the survey. Sampling of otoliths, weight and maturity was performed on 4 013 herring and 1 790 sprat.

The surveys in September/October are coordinated within the frame of the Baltic International Acoustic Surveys (BIAS). The data are stored in “Fish sample database” (IMR, Sweden) and sent for international data storage to WGBIFS in the BAD1 database. The present survey will provide data to the ICES Assessment Working Group (WGBFAS). Data is also available to be uploaded in FishFrame.



Map 3. Survey grid and trawl positions of R/V Argos during BIAS survey 2010

International Bottom Trawl Survey (IBTS) first and third quarter

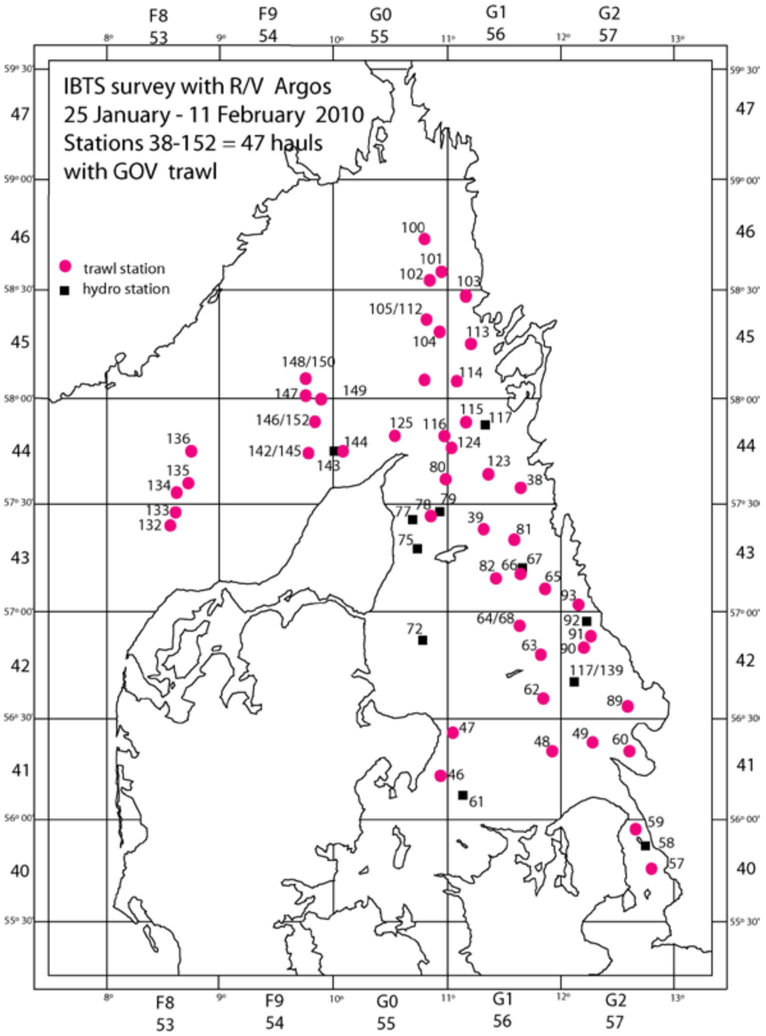
The main aim of the survey is to estimate abundance of commercial fish species (cod, haddock, whiting, norway pout, herring, sprat, saithe and mackerel) and non commercial fish species and to collect otoliths of commercial species to assess abundance by age, in particular for the recruiting year classes in the North Sea, Skagerrak and Kattegat. The IBTS survey is coordinated by the ICES International Bottom Trawl Survey Working Group.

All survey data are stored in "Fish sample database" (IMR, Sweden) and sent to DATRAS for international data storage. The present surveys provides data to the ICES Assessment working groups WGBFAS, HAWG and WGNSSK.

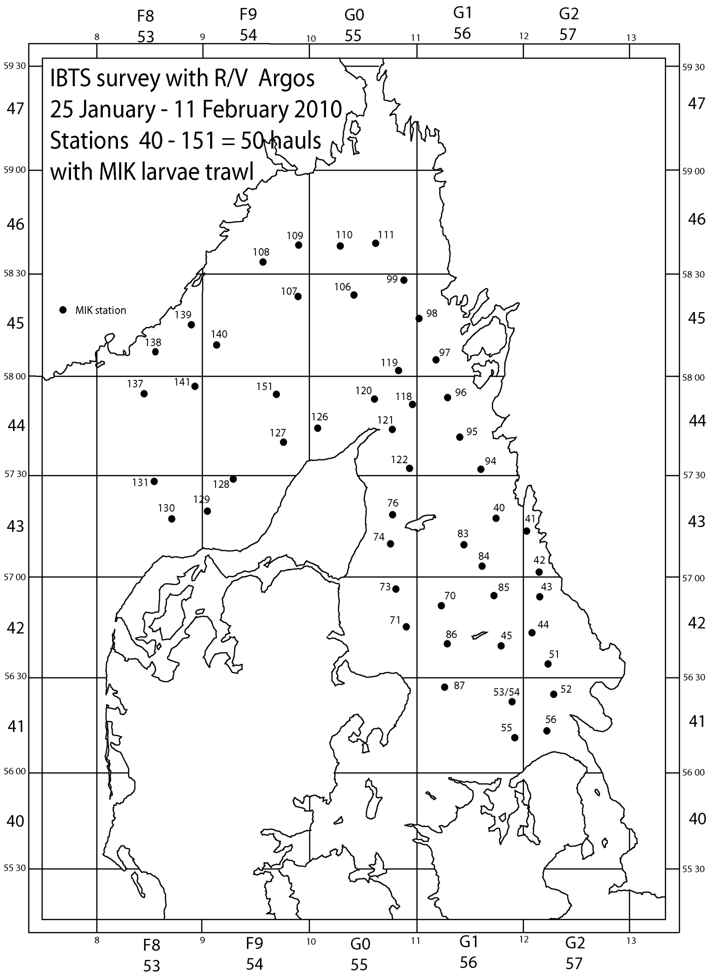
IBTS first quarter

The survey was conducted between 25/1 – 11/2 using the GOV demersal trawl according to the IBTS manual (Anon., 2006b). In total, 47 valid hauls were realized during this survey within 14 days at sea. One station was not possible to trawl due to the ice coverage. The hauls with GOV demersal trawl were made in the Skagerrak/Kattegat area (Map 4.a).

Sampling of otoliths, individual weight and maturity stage were performed on 824 cod, 286 haddock, 35 saithe, 141 norway pout, 84 hake, 783 plaice, 32 sole, 1 390 herring and 580 sprat. Overall 56 fish species were caught. In total, 50 larvae hauls (targeting herring and sprat larvae) were conducted during the nights using a MIK (Methots Isaacs Kidd) larvae trawl according to the IBTS manual (Anon., 2006b). On average, 0.1 herring larvae and 0.2 sprat larvae per haul were caught (Map 4.b)



Map 4.a Hauls with GOV demersal trawl IBTS first quarter survey 2010.

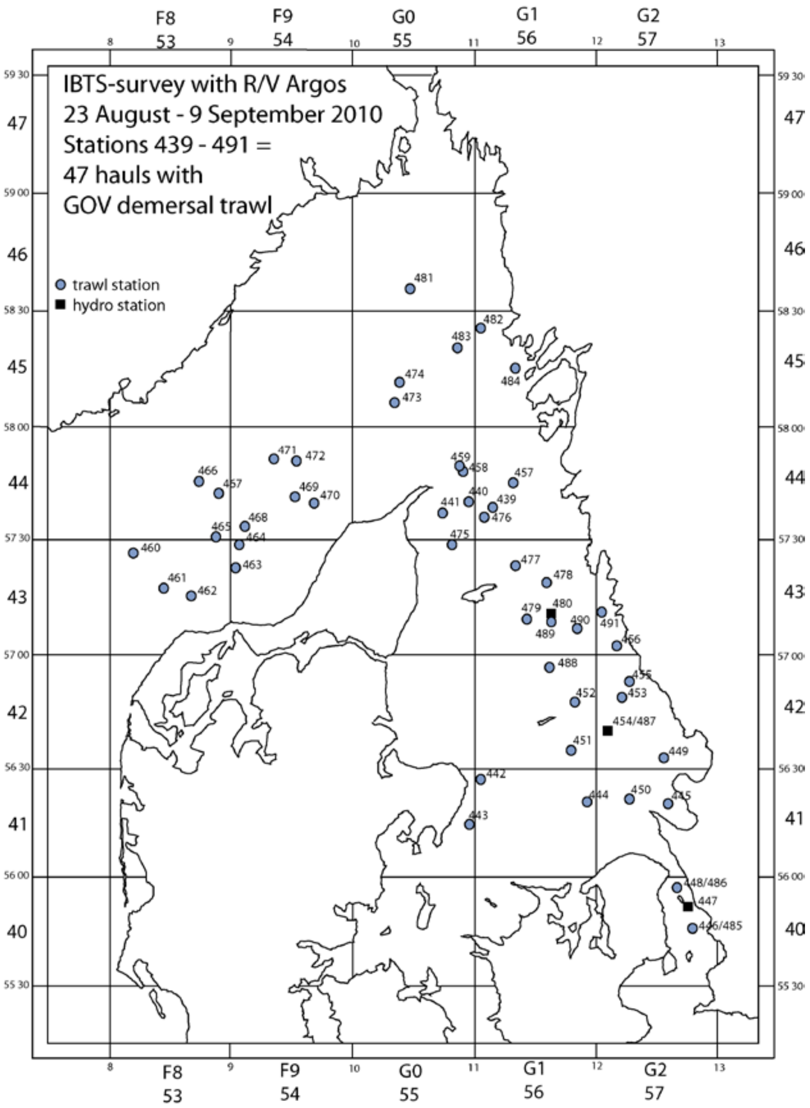


Map 4.b. MIK larvae trawl IBTS first quarter survey 2010

IBTS third quarter

The survey was conducted during the period 23/8– 9/9 using the GOV demersal trawl according to the IBTS manual (Anon., 2006b). All planned hauls could be made within 14 days at sea. In total 47 valid hauls using a GOV demersal trawl were made in the Skagerrak/Kattegat area (Map 5). Sampling of otoliths, individual weight and maturity stage was performed on 417 cod, 244 haddock, 258 saithe, 145 norway pout, 66 hake, 758 plaice, 12 sole, 1 396 herring and 787 sprat. Overall 62 fish species were caught.

On this survey we used, for the sixth time, a semi random stratified sampling design in the Skagerrak. The reason for this change is that the typography in the area is more divers compared to the rest of the North Sea.



Map 5. Hauls with GOV demersal trawl IBTS third quarter survey 2010.

Underwater TV (UWTV) survey on *Nephrops* grounds.

Uncertainty over landings figures and concern over some of the analytical assumptions upon which analytical assessments are based, has lead to investigations into alternative approaches for providing *Nephrops* advice.

Nephrops stocks are limited to bottoms with suitable silty clay sediment where they live in burrows. This mud-burrowing species is protected from trawling while inside its burrow. Burrow emergence is known to vary with environmental (ambient light intensity) and biological (moult cycle, female reproductive condition) factors. Trawl surveys are therefore not ideal for *Nephrops*, and underwater TV (UWTV) has been developed as a means of estimating stock size from burrow densities.

The Marine laboratory in Aberdeen developed a fishery independent UWTV survey in early 1990´s in order to estimate stock size from burrow densities. UWTV consists of a video camera mounted on a sledge that is towed slowly (0.5-0.8 knot) on the bottom by a vessel. *Nephrops* burrows are counted and converted into densities using information on the width of the view of the camera and length of the tow. Mean weight from biological samplings are used to estimate stock biomass

ICES Advisory Committee for Fisheries Management (ACFM) recommend that UWTV surveys should be used to provide biomass estimates for mud-burrowing animals like *Nephrops*.

The Swedish and Danish *Nephrops* fishery has got an increasing economic importance in recent years and it was agreed that Denmark and Sweden start a joint UWTV survey at around 90 stations on *Nephrops* grounds in the Skagerrak and Kattegat.

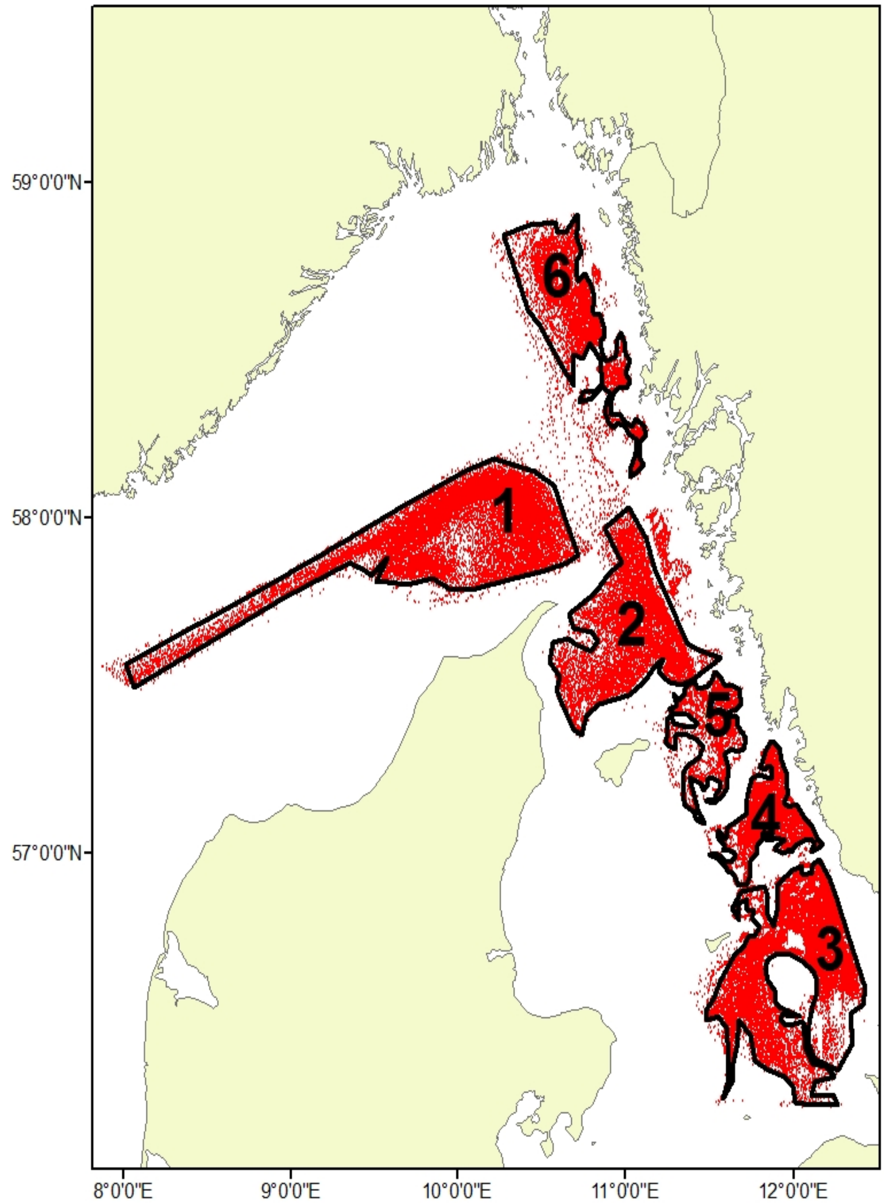
The UWTV survey during 2010.

The 2010 UWTV survey started with equipment of a hydraulic controlled cable drum on aft deck and a hydraulic controlled ramp in the stern of the R/V Asterix. A ramp by the stern simplify the handling of the sledge and make it even possible to conduct the survey with one person on deck.

The survey is based on technical setups similar to those applied in the U.K. A standard set up has successfully been applied and due to good weather conditions highly good quality footages of the *Nephrops* burrow systems have been accomplished for 2010.

The distribution of the *Nephrops* stock in IIIa (Skagerrak and Kattegat) was estimated from Danish and Swedish VMS data from *Neprops* trawler (>15 m) with landings consisting of at least 50% *Nephrops*. The *Nephrops* grounds in IIIa has been divided into six sub areas as shown in the map below.

The 2010 TV survey was conducted during the period 5/5 – 19/5 using the Danish sledge on the Swedish UWTV vessel and resulted in 52 valid hauls in sub division IIIa (13 hauls in area 2, 15 in area 4 and 24 hauls in area 6).



Map 6. Map over distribution of Swedish and Danish *Nephrops* trawlers (vessels > 15m) from VMS positions (red dots) during 2010 and Division IIIa divided into six subareas with *Nephrops* grounds

Subarea	km^2
1	3 079
2	1 905
3	2 462
4	676
5	670
6	1 289
IIIa	10 081

III.G.2 Data quality: results and deviation from NP proposal

Generally, the surveys are following the international manuals set up for the different surveys. The quality is therefore established by these manuals. Sweden is following the written manuals and is actively taking part in quality work done in the WGBIFS and WGBITS. No deviations can be reported for the surveys undertaken during 2010.

For the new UWTV survey, Sweden and Denmark are cooperating by sharing equipment and staff. Sweden also participated in a Danish intercalibration for interpretation of the videos taken on the burrows. The quality of data received is accepted by the WGNSSK and the assessment of the *Nephrops* stock in IIIa was based on TV survey for the first time in 2011.

III.G.3 Follow-up of regional and international recommendations

Recommendations set up in the different survey working groups have been taken care of by the Swedish participants taken part in the meetings.

III.G.4 Actions to avoid shortfalls

No shortfalls to be reported and therefore no actions to be taken

IV. Module of the evaluation of the economic situation of the aquaculture and processing industry

IV.A Collection of economic data concerning the aquaculture

IV.A.1 Achievements: results and deviation from NP proposal

The planned sampling scheme and the results can be seen in table IV.A.2 in the tables whereas the results for individual variables can be found in table IV.A.3. The aquaculture population can be found in table IV.A.1.

Economic data for the reference year of 2009 was collected and compiled by Statistics Sweden in cooperation with the Swedish Board of Fisheries. Three sources of information were used: income tax declarations (census data), a questionnaire (Q1) sent to every aquaculture farm unit (census data) and a questionnaire (Q2) sent to a non-probability sample of 46 aquaculture enterprises. All three parts were implemented and compiled by Statistics Sweden.

The planned segmentation presented in the National Programme 2009 – 2010 was made before the declaration of the Council Regulation (EC) No 199/2008 of 25 February 2008 and the Commission Decision of 6 November 2008. Therefore the final segmentation presented in the Technical Report 2010 is quite different from the one proposed in the National Programme 2009 - 2010. Moreover, due to confidentiality reasons the some of the segments had to be merged into clusters. For example the segment for salmon had to be merged with trout because the numbers of enterprises in the salmon segment were too few to be presented separately. Also mussels and oysters had to be merged due to confidentiality reasons. The final clustering of strata are presented in the table below:

Clustered strata for reporting	No of enterprises in clustered strata	Segments
Land based farms- On growing, Combined-Salmon and Brown trout	21	Land based farms – On growing - Salmon
		Land based farms - Combined - Salmon
		Land based farms-On growing-Brown Trout
		Land based farms-combined-Brown Trout
Land based farms - On growing –Other freshwater fish (Rainbow trout, Arctic char, Eel and other freshwater fish)	40	Land based farms - On growing - Arctic char
		Land based farms - On growing - Eel
		Land based farms - On growing - Other freshwater fish
		Land based farms - On growing - Rainbow trout
Land based farms - Combined – Other freshwater fish (Rainbow trout)	14	Land based farms - Combined - Arctic char
		Land based farms - Combined - other fresh water fish
		Land based farms - Combined - Rainbow trout
		Hatcheries and nurseries - Other fresh water fish
Cages - Salmon and Brown trout	6	Cages - Salmon
		Cages - Brown trout
Cages –Other freshwater fish(Rainbow trout and Artic Char)	63	Cages - Rainbow trout
		Cages - Arctic char
Shellfish and farming techniques – Long line – Mussels and Oysters	6	Shellfish farming techniques - Long line - mussels
		Shellfish farming techniques - Other - oysters
Shellfish farming techniques-Other technique-other shellfish (crayfish)	42	Shellfish farming techniques-Other technique-other shellfish (crayfish)

The segment other shellfish (crayfish) as proposed in the National program was not included for reference 2008 but has been added for reference year 2009. For 2008 its was not possible to give any reliable estimation on crayfish at all due to a non-updated register on crayfish farms.

In the National Programme for 2009-2010 Sweden planned to involve Fiskhälsan AB (responsible for the National Fish Health Control Programme in Sweden) to collect detailed data on variable costs, imputed value of unpaid labour, costs for feed and livestock as well as volume. These data were planned to be used for compiling a cost allocation key to specify variable costs from income tax declarations and for estimations of variables as mentioned above. After thorough discussions these plans were abandoned due to statistical reasons. Since not all aquaculture enterprises in Sweden are obliged to be a part of the National Fish Health Control Programme the population of aquaculture enterprises that Fiskhälsan AB is able to collect data from is a subpopulation of the total population. This subpopulation does not coincide with the population that Statistics Sweden collects data from which means that data collected by Fiskhälsan AB has to be estimated for the total population. Estimating the variables collected in questionnaire Q2 for the target population would not have been possible since Fiskhälsan AB and Statistics Sweden due to confidentiality can not exchange primary data, neither can they share primary data with the Swedish Board of Fisheries. With no connection between data and the individual enterprise there is no possibility to estimate the variables according to the segmentation and not even for the total population. The most cost efficient and statistically sound way of dealing with these issues was to let Statistics Sweden collect and compile all data and not involve a third part.

There would also have been problems with clustering farming units into enterprises since Fiskhälsan AB does not have access to income tax declarations and therefore can only use the individual farm as the smallest statistical unit. In many cases several farms belong to the same enterprise and several farms then need to be clustered to the correct enterprise. The clustering has to be based on information from income tax declarations that Statistics Sweden has access to. The income tax declarations are confidential and can not be exchanged between Statistics Sweden and Fiskhälsan AB. This means that Fiskhälsan AB can not cluster farming units into enterprises.

IV.A.2 Data quality: results and deviation from NP proposal

The planned sample is presented as a range in Table IV A 2. The first figure refers to the questionnaire (Q2) based on a non-probability sample and the second figure refers to census data from both income tax declarations, administrative records and a questionnaire (Q1) sent to all aquaculture farmers. The sample for the second questionnaire (Q2) is a non-probability sample based on a priori information that comes from Q1 and income tax declarations. Therefore it could not be planned before the income tax declarations and the results of the first questionnaire (Q1, covering every farming unit) were compiled. Based on the results of the census data, Statistics Sweden made decisions on which enterprises were most representative for the second questionnaire (Q2). In order to be sure of covering large enterprises as well as enterprises from all other appropriate corporate structures and enterprises from every segment, Statistics Sweden decided on the appropriate sampling and sample size for this questionnaire (Q2). The questionnaire 2 was sent out 46 enterprises with response rate of 65 percent.

The questionnaire 2 (Q2) for reference year 2008 was reused for reference year 2009. The primarily objective of Q2 was to create a cost allocation key for costs that are not specified in income tax declarations. This cost allocation key can not possibly have changed from one year to the next to such an extent that it will have negative effects on the quality of data. The cost and burden for enterprises of sending out Q2 every year is therefore not defendable. Instead we plan to use a longer time horizon so that Q2 will be sent out again in the following years in order to study possible changes in the cost allocation. However, the variable fish feed volume will not been possible to estimate for reference year 2009. For reference 2008 it was possible but only when strata were further clustered into, land based farming technique and cages, respectively.
Furthermore data on crayfish enterprises under data collection scheme C in table IV_A_3 is for reference year 2009 estimated using the created cost allocation key for mussel companies.
~~Furthermore data on crayfish enterprises under data collection scheme C in table IV_A_3 will be missing.~~

We define primary activity as follows. The questionnaire (Q1) is sent out to all aquaculture farm units. The farm units are clustered into enterprises. For each enterprise the value of sales from Q1 are compared to the income reported in tax declarations. Enterprises which have between 70% and 143% of their income from aquaculture (income from tax declarations/sales value from Q1) are considered to have their primary activity in aquaculture. These enterprises will represent the cost allocation, which is derived from income tax declarations combined with Q2, for all aquaculture activity in Sweden. By comparing value of sales from Q1 which covers all aquaculture activity in Sweden with income in tax declarations for the enterprises with aquaculture as their primary activity we get a figure which we can use to scale-up all the relevant variables so that they will represent all aquaculture activity in Sweden. It will still be the same allocation between variables as it is for the enterprises with aquaculture as their primary activity. In this way we cover all aquaculture in Sweden.

IV.A.3 Follow-up of regional and international recommendations

No relevant recommendations have been made about the collection of economic data on the aquaculture sector.

IV.A.4 Actions to avoid shortfalls

We have now established a population except for minor yearly changes of new enterprises entering aquaculture production and others ending their production which will cause natural changes in the population. The crayfish producers are not part of the population of 2008 since we still need to establish the correct number of farming units in order to cluster them into enterprises. The Swedish Board of Fisheries has been working on this task and was able to include crayfish farming for the reference year 2009. The basic method used to collect the data for reference year 2009 is the same as for 2008. We focus on keeping the method consistent from one year to the next in order to ensure full comparability. We will send out Q2 again in the following years in order to ensure good quality of data.

IV.B Collection of data concerning the processing industry

IV.B.1 Achievements: results and deviation from NP proposal

The planned sampling scheme and the results can be seen in table IV.B.1 in the tables whereas the results for individual variables can be found in table IV.B.2.

The data was collected and processed by Statistics Sweden through the SRU register which is maintained by Statistics Sweden and consists of income tax declarations in Sweden. Part of the data is also collected from the Statistical Business Register which is a central register consisting of information on all registered enterprises in Sweden which is maintained by Statistics Sweden. Two variables where collected through questionnaires by Statistics Sweden based on PPS-selection in the Statistical Business Register. The variables collected through questionnaires are subsidies and energy costs. The questionnaires are the base for estimating an allocation key to allocate costs and income to variables not included in the company/financial accounts. The total sum of costs and total sum of income is unaffected. The data still holds for calculations such as gross value added and return on investment.

All data is collected, estimated and checked by Statistics Sweden which ensures the consistency of the final data.

The achieved sample rate is 100 % for variables collected through company/financial accounts by Statistics Sweden.

IV.B.2 Data quality: results and deviation from NP proposal

Although all data is collected and processed by Statistics Sweden some variables are not available through company/financial accounts. Some variables are collected through questionnaires such as energy costs and subsidies. Enterprises are sometimes confusing energy cost with raw material. Statistics Sweden then has to make calculations using different sources which make it impossible to calculate an accuracy indicator for energy costs.

IV.B.3 Follow-up of regional and international recommendations

No related recommendations have been made about the collection of economic data on the processing industry.

IV.B.4 Actions to avoid shortfalls

In data collection from 2010 (reference year 2008) and onward the fish processing industry is an own stratum. This means that the questionnaire to estimate subsidies and energy costs 2010 (reference year 2008) has been sent out to 13 enterprises, compared to 4 during 2009 (reference year 2007). The response rate was 85 %.

V. Module of evaluation of the effects of the fishing sector on the marine ecosystem

V.1 Achievements: results and deviation from NP proposal

The Swedish Board of Fisheries can realize the data requirements for the indicators 1-4 proposed in the Commission Decision 2010/93/EC Appendix XIII through the annual surveys. The spatial and temporal coverage of data collection for the evaluation of effects of the fishing sector will consist of area IIIa in the first and third quarters and area IIId in the first and fourth quarters 2010. The data collection will be fishery independent and is carried out by our research vessel ARGOS using standard gear, thereby fulfilling the required precision level. The surveys are described in section III.G.1. Data on species, length frequencies and abundance will be collected from all hauls including individual parameters such as age, length, sex and maturity from the target species of the survey at the required precision level.

Sweden is collecting VMS data and the Research and Development Department of the Swedish Board of Fisheries has full access to VMS data from all Swedish vessels in all waters. Positions are reported once every hour for boats of 15m length or longer. Data can be aggregated at metier level 6 for environmental indicators 4, 5 and 6 and processed accordingly.

V.2 Actions to avoid shortfalls

No shortfalls to be reported and therefore no actions to be taken.

VI. Module for management and use of the data

VI.1 Achievements: results and deviation from NP proposal

The development of databases during 2010 included projects for the data collection at the Institute of Costal Research (ICR), for the data collection at the Institute of Marine Research (IMR) and for the data collection of economical and transversal data at the Swedish Board of Fisheries (SBF).

The Institute of Costal Research continued their project of improving their new system including data entry and reporting of fish sample data. The development phases during 2010 covered:

- Continued work with the conversion of data.
- Improvements of the data entry system.
- Improvements of the data warehouse for reporting of the fish sample data.

The Institute of Marine Research continued with their project of modernizing and refactoring the existing system including data entry and reporting of fish sample data. The development phases during 2010 covered:

- Continued work with the development of the data entry routines.
- Continued work with the migration of data from the current Oracle database to the new Oracle database.

For the data collection of economical data the project to modernize and rebuild the existing systems including data entry and reporting continued. The development phases during 2010 covered:
Processing industry

- Continued development of a data warehouse for the reporting of economical data.

Aquaculture industry

- Continued development of a data warehouse for the reporting of economical data.

Fishing sector

- Continued development of data entry routines.
- Continued development of a data warehouse for the reporting of economical data.

For the data collection of transversal data a pilot study, focused on modernizing and rebuilding the existing system, was started.

VI.2 Actions to avoid shortfalls

No shortfalls to be reported and therefore no actions to be taken.

VII. Follow-up of STECF recommendations

The summary of recommendations sent to the MS was of advantage when compiling the list of recommendations and actions taken but refers only to reports produced 2009. All recommendations made and put in reports during 2010 are not summarized. However, there is still complicated to evaluate what recommendation to follow up while the system starts to be large and complex. There is a need to organise and maybe compile these recommendations in a “database”like structure were the information can be sorted more easily.
Sweden has taken the recommendations made by SGRN (Evaluation of the 2009 Annual report and the evaluation of 2010 National Programme) under consideration while writing the Annual report for 2010.

Source	Recommendation	Action
SGRN 2010-02	*Relevant MS to attend the RCM LDF in future if the corresponding MS has a long-distance fishery in "Other regions" and to be equipped with the necessary data, background information and mandate to take decisions.*	SWEDEN IS NOT TAKEN PART IN THE RCM LDF DUE TO LITTLE ACTIVITY IN OTHER REGIONS
SGECA-09-02 (2009)	*SGECA-09-02 recommends that MS should carefully assess the impact of non-response, especially in the case of census with low response rate.*	STATISTICS SWEDEN AND THE SWEDISH BOARD OF FISHERIES CORRECTS FOR NON-RESPONSES IN CENSUS DATA COLLECTION BY REWEIGHTING ESTIMATES USING AUXILIARY INFORMATION SUCH AS EFFORT OR VALUE OF LANDINGS.
SGECA-09-02 (2009)	*Due to concerns raised over the implications for data time series if clustering practices change over time, SGECA-09-02 recommends MS to take this into account when they segment the fleet in order to produce consistent time series over time.*	SWEDEN TAKES INTO ACCOUNT THESE ISSUES AND WORK TO ASSURE THAT CLUSTERING SCHEMES DOES NO CHANGE OVER TIME. SWEDEN USE THE SAME METHOD FOR CLUSTERING OVER TIME.
SGECA-09-02 (2009)	*SGECA-09-02 recommends that MS assess the comparability of economic variables over time, include the results in the TR and discuss inconsistencies in trends.*	AS PART OF THE QUALITY EVALUATION OF THE FINAL DATA SWEDEN CONDUCTS THIS TYPE OF ANAYLSIS.
SGECA/SGRN 09-02	*SGRN has repeatedly recommended every MS to estimate the precision of the data obtained by sampling in order to assess the quality of the associated estimates. In SGRN opinion, the best way to explore data is to evaluate the precision with the aim of optimising the sampling design (see Section 7.2 in SGRN-06-03 report, Anon. 2006). More than the exact quantification of the level of uncertainty, the objective of calculating precision levels should be to improve the quality of the data that is collected. In parallel, SGRN has supported the idea of developing a common tool for assessing the accuracy and precision of the biological parameters estimated through sampling programmes. Such a tool has been granted financial support by the Commission through the Call for Service Contracts FISH/2006/15. (COST project) SGRN will continue to request all MS to assess the quality of the estimates even if the different methodologies used prevent the direct comparisons of the results between MS."*	SWEDEN HAS PROVIDED ESTIMATES OF PRECISION FOR ALL ECONOMIC VARIABLES IN THE ANNUAL REPORT BOTH FOR REFERENCE YEAR 2008 AND 2009.
SGRN June 2009 Evaluation of TR 2008	***The TR should be structured by region***	From 2009 onwards Sweden will follow the guidelines and structure the National programme and Technical report by region.
SGRN Febr 2009 Evaluation of NP 2009-2010	***General: Although the proposal metiers mergers are sensible there is no statistical evidence put forward to justify them.***	"The merging of metiers is for the planned sampling in 2009-2010 not always based on a thorough scientific analysis but on the

		knowledge of the exploitation pattern, management of the fisheries and "common sense". Scientific analysis of the metiers and the possibilities to merge them based on scientific analysis will be a prioritised issue during the programme period. WKMERGE (2010), in which Sweden will participate will be of great value for the analyses of merging fisheries.
SGRN Febr 2009 Evaluation of NP 2009-2010	***General: Discard level for metiers which are not selected by ranking is not included in the NP***	Metiers not selected by the ranking have not been selected for discard sampling as "*stand alone metiers*". The main reason for this is that the activity and catches in these metiers are low making sampling difficult and cost ineffective. Metiers not selected by the ranking system are further to a certain extent included in merged metiers that are sampled.
SGRN Febr 2009 Evaluation of NP 2009-2010	**Economic and Transversal Variables: the method for raising the sample results to the total population is not clearly presented. more clear information of the method used for this calculation is needed.**	Sweden has within this section in the Technical report 2009 specified the methods used for the calculations.
SGRN Febr 2009 Evaluation of NP 2009-2010	**Metier-related variables; It is not clear if <10 are included.**	Sweden are including all vessels for the ranking and vessels < 10 meters are included.

VIII. List of acronyms and abbreviations

ACE	Advisory Committee on Ecosystem
ACOM	Advisory Committee
BIAS	Baltic International Acoustic Survey
BITS	Baltic International Trawl Survey
COST	Common Open Source Tool
DATRAS	Database Trawl Surveys
GUI	Graphical User Interface
HAWG	Herring Assessment Working Group for the Area South of 62˚ N
HELCOM	Helsinki Commission
IBTS	International Bottom Trawl Survey
IBTSWG	International Bottom trawl Survey Working Group
PGCCDBS	Planning Group on Commercial Catch, Discards and Biological Sampling
RCM Baltic	Regional Co-ordination Meeting for Baltic Sea
RCM NS & EA	Regional Co-ordination Meeting for North Sea and East Arctic
SERS	Database for electrofishing
SGRN	Study group for research Needs
STECF	The scientific, Technical and Economic Committee for Fisheries
WGBIFS	Baltic International Fish Survey Working Group
WGBFAS	Baltic Fisheries Assessment Working Group
WGBAST	Baltic Salmon and Trout Assessment Working Group
WGEEL	Working Group on Eels
WGFAST	Working Group on Fisheries Acoustics Science and Technology
WGNSSK	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak
NIPAG	The joint NAFO/ ICES Pandalus Working Group
VMS	Vessel Monitoring System
WKACCU	Workshop on methods and to evaluate and estimate the Accuracy of Fisheries Data used for Assessment
WKDRASS	ICES Workshop on the Design of Regional Age Sampling Schemes [
WKFLAT	Benchmark workshop on Flatfish
WKMERGE	Joint ICES-STECF Workshop on methods for merging fleet metiers for fishery based sampling

IX. Comments, suggestions and reflections

In the report from SGRN 10-02 meeting a lot of recommendations were made to improve the guidelines for writing the AR 2010. The valuable suggestions for improvement has not been formalised and no new guidelines were distributed. Sweden welcomes an update of the guidelines until next year.

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XI. Annexes

Annex I a

Introduction to estimation of precision (mCV) using the bootstrap method
One statistically way of estimating dispersion of a variable or a parameter is to make bootstrap samples of the original data (Efron & Tibshirani 1993). While waiting for the standard tool (COST) for analysing precision, Sweden has calculated mCV in the stock sampling in the NP of DCR and DCF (Year 2009) using a bootstrap method. The results from the analyses have been used to adjust the sampling size as well as improve and optimise the sampling scheme.

In 2010, the mCV, both in the stock sampling (species below) and in metier/fisheries sampling (length compositions in the coastal fisheries below), was calculated using our own written scripts executed in "R". Information about "R", see http://www.r-project.org/ .

Estimation of precision (mCV) for length compositions in the Baltic Sea and the North Sea and Eastern Arctic

Here details regarding the precision levels given in ***Table III.C.5 – Sampling intensity for length compositions (all metiers combined) in part III.C Biological - metier-related variables*** *are presented.*

Method for estimating mCV for length compositions in selected Species-Fishing ground units (Data from Coastal fisheries) in Table III.C.5
Sampling of fisheries can be carried out on unsorted catches, landed fish and/or discard and we present mCV values for the Species-Fishing ground units (listed below) in the Swedish coastal fisheries (also listed below) accordingly to how sampling was performed.

In the mCV estimates, lengths from the stock sampled individuals are included. We have *not* divided the data on fisheries, and hence, the precision is calculated over fisheries with different length distributions, for example catches of herring with active gears (trawls) and passive gears (gill nets) are likely to have different length distributions. Also, silver eel and yellow eel have large differences in length distributions but are pooled. Thus, the estimated precision values do not reflect the precision of the length distribution in specific fisheries but in catches as whole. We have not weighted our results with how much of total catches that come from specific fisheries, e.g. for herring trawl catches can be several times higher than catches from gillnetters targeting herring. Furthermore, data is pooled from different seasons of the year (all months/quarters) and different fishing areas (several SD together).

We have from a sample of *n* individuals made bootstrap samples of *n* individuals of the original data. For each bootstrap sample we calculated mean length, and the bootstrap sampling was repeated 1000 times for each species. We calculated the dispersion of the mean length as the standard deviation across all bootstrap samples divided by the mean length from all bootstrap samples. This is our estimated "Precision (CV) achieved" in AR Table III.C.5.

We have generally not calculated mCV of length for species and fishing grounds units with less than 50 individuals in the sample. However, for the Group 1 species mCV was calculated if ≥ 40 individuals in the sample.

Estimation of mean CV for Baltic herring, Flounder, Eel and Salmon in the Baltic sea and for Eel in the North Sea and East Arctic

*Here details regarding the precision levels given in **Table III.E.3 - Sampling intensity for stock-based variables in section III.E Biological – stock-related variables** are presented.*

Method for estimation of mCV for weight, length, sex-ratio respectively maturity at age
Sampling for Baltic herring (Subdivision 30-31), flounder, eel and salmon is based on random samples of 100-300 individuals collected from landings and/or discard from selected fishing vessels. However, since there are very few samples per stratum (subdivision, gear, and month/quarter), analytical methods for calculating coefficient of variation (CV) is not appropriate, and the bootstrap method was used instead (see WKSCMFD 2004).

When calculating mean CV (mCV), each subdivision, gear and quarter was considered as the standard sampling unit (exceptions explained below in the table headings). We have from a sample unit of *n* individuals made bootstrap samples of *n* individuals of the original data. For each bootstrap sample we calculated mean weight, length, sex ratio and maturity at age. The bootstrap sampling was repeated 1000 times for each data set. We calculated the dispersion of mean values as the standard deviation across all bootstrap samples. However, as dispersion tend to increase with increasing size of individuals we, for weight and length at age, divided the standard deviation with mean values of weight and length at class, respectively. This is our estimated mCV. Note that we did not do this correction for sex ratio and maturity as there is no reason to believe dispersion should change with mean values in any systematic way as these were proportions. Instead we kept standard deviation of the means over all 1000 bootstrap sample as our estimate of dispersion of mean values.

In the cases where there were fewer than 50 individuals for a quarter and subdivision, quarters (or eventually subdivisions) were merged to increase sample size.

In samples for the age analyses, where individuals had been stratified, i.e. sampled in relation to length, the probability of an individual to be included in a bootstrap sample was related to its occurrence in a random length sample from the same catch. This sampling method ensures in a cost-efficient way, that the length distributions in the bootstrap sample were similar to the length distributions in a corresponding larger random sample.

The estimated mCVs at each age are presented for each species and sampling unit in **Tables 1-5 (a)** below.

For flounder, sexes have been separated since they differ substantially in their growth and thereby in their abundance in the catches (and sampling). For eel, silver eel (mature) and yellow eel (immature) are caught in different gears, and therefore, both sampling and estimation of mCV are done separately for the two stages of the species. Also, the eels caught are almost exclusively females and in the mCV estimates the very few males were excluded since females and males also in these species differ very much in their growth. Thus, since the eel fishery indirectly is stratified on sex and maturity, the mCV for these two variables is not calculated. Furthermore, depending on NP sampling strategy, the estimates for eel are done either per quarter or per fishing season. For salmon, mCV for maturity is not included in the NP. Furthermore, it was not possible to sample sex-ratio for all Salmon, see Table 5. Finally, in all estimations of mCV only commercially caught individuals have been included.

The mCV for each subdivision and quarter, and for flounder sex, was calculated as a grand average of mCV from each age class, weighted for how many individuals there were in the different age classes.

Hence, we used data from all age classes but weighted data relative to the abundance in each age class. Estimated grand mCV for each sampling unit is presented in **Tables 1-5 (b).**

Calculation of precision target in Table III.E.3

The “Achieved precision target (CV)” in AR Table III.E was then calculated as the average of mCV values over all quarters and all subdivisions for each species,. Except for eel that was divided between two fishing grounds in the Baltic Sea Region and one fishing ground in the North Sea and Eastern Arctic Region. Here the two stages of the species were pooled

Table 1a.) For each age, mCV of weight at age (CV_W), length at age (CV_L), sex-ratio (CV_Sex) at age and maturity at age (CV_Mat) achieved for **Baltic herring** and sampling unit "SD, gill nets (GNS) and quarter (Q)" in R out-put format. (AgeC) is age class and (nAge) is number of individuals in each age class in original sample. (CV_AC) is standard variation of the mean proportion of age class x in the population.

SD	Q	Gear	Sex	AgeC	nAge	CV_W%	CV_L%	CV_Sex%	CV_Mat%	CV_AC%
30	2	GNS	Both	3	1	0	0	0	0	163.474
30	2	GNS	Both	5	2	4.235	0.673	0	0	91.642
30	2	GNS	Both	6	8	3.26	1.116	12.749	0	36.052
30	2	GNS	Both	7	12	4.441	1.631	16.315	0	30.803
30	2	GNS	Both	8	46	1.838	0.526	6.62	0	11.556
30	2	GNS	Both	9	29	3.578	0.944	9.662	0	17.388
30	2	GNS	Both	10	20	2.67	0.705	9.943	0	18.135
30	2	GNS	Both	11	15	2.595	0.776	14.131	0	25.663
30	2	GNS	Both	12	25	2.656	0.477	8.551	0	16.85
30	2	GNS	Both	13	13	5.619	1.505	18.142	0	31.563
30	2	GNS	Both	14	11	6.042	1.664	19.902	0	37.022
30	2	GNS	Both	15	4	17.924	3.919	27.631	0	57.475
30	2	GNS	Both	16	6	8.981	1.338	35.696	0	58.334
30	2	GNS	Both	17	1	0	0	0	0	64.23
30	2	GNS	Both	19	1	0	0	0	0	240.232
31	2	GNS	Both	2	3	16.888	5.358	46.294	0	110.156
31	2	GNS	Both	3	10	3.822	1.569	37.387	0	64.584
31	2	GNS	Both	4	21	1.863	0.525	9.469	0	17.633
31	2	GNS	Both	5	42	1.58	0.495	6.485	0	11.368
31	2	GNS	Both	6	23	2.133	0.714	8.468	0	15.655
31	2	GNS	Both	7	11	3.113	1.045	13.001	0	25.131
31	2	GNS	Both	8	9	2.532	0.817	12.58	0	28.29
31	2	GNS	Both	9	21	3.515	1.095	13.08	0	26.649
31	2	GNS	Both	10	26	3.344	1.12	13.551	0	24.882
31	2	GNS	Both	11	9	3.484	1.498	31.732	0	52.555
31	2	GNS	Both	12	2	3.12	0	0	0	124.503
31	2	GNS	Both	14	2	4.773	0	0	0	85.06

Table 1a. Cont.

SD	Q	Gear	Sex	AgeC	nAge	CV_W%	CV_L%	CV_Sex%	CV_Mat%	CV_AC%
30	3	GNS	Both	2	1	0	0	0	0	193.761
30	3	GNS	Both	3	11	10.681	3.292	34.183	0	55.793
30	3	GNS	Both	4	10	15.045	4.033	26.725	0	55.856
30	3	GNS	Both	5	9	5.844	1.685	27.931	0	51.485
30	3	GNS	Both	6	14	3.344	0.88	17.349	0	32.761
30	3	GNS	Both	7	38	1.773	0.535	6.709	0	12.259
30	3	GNS	Both	8	33	2.509	0.898	8.216	0	15.688
30	3	GNS	Both	9	10	3.4	0.721	12.056	0	24.485
30	3	GNS	Both	10	19	2.922	0.785	10.646	0	19.053
30	3	GNS	Both	11	22	3.073	0.861	9.506	0	19.221
30	3	GNS	Both	12	24	4.398	0.874	9.769	0	17.428
30	3	GNS	Both	13	12	5.277	1.289	13.161	0	32.346
30	3	GNS	Both	14	5	6.514	1.341	26.334	0	45.146
30	3	GNS	Both	15	9	3.013	1.139	12.345	0	27.595
30	3	GNS	Both	16	1	0	0	0	0	137.552
30	3	GNS	Both	17	2	3.526	2.723	0	0	68.071
30	3	GNS	Both	18	2	24.251	6.497	0	0	113.472
30	3	GNS	Both	19	1	0	0	0	0	62.457
31	3	GNS	Both	1	34	4.296	1.274	14.888	13.899	26.507
31	3	GNS	Both	2	45	1.253	0.561	7.269	4.517	11.833
31	3	GNS	Both	3	24	2.597	0.843	8.664	3.354	16.48
31	3	GNS	Both	4	66	1.809	0.575	5.715	2.278	9.228
31	3	GNS	Both	5	14	3.539	1.294	12.137	0	22.477
31	3	GNS	Both	6	3	4.397	0.48	42.017	0	87.19
31	3	GNS	Both	8	1	0	0	0	0	98.371
31	3	GNS	Both	9	2	17.581	2.849	0	0	82.699

Table 1b.) Grand mCV of weight at age (Weight), length at age (Length), sex-ratio at age (Sex) and maturity at age (Mat) achieved for **Baltic herring** and sampling unit "SD, gill nets (GNS) and quarter (Q)" in R out-put format. (Age) is the grand average of SD over all age classes of the mean proportion in age class x.

SD	Q	Gear	Sex	N	Weigth %	Length%	Sex%	Mat%	Age%
30	2	GNS	Both	194	3.221	0.842	10.72	0	0.017
31	2	GNS	Both	179	2.312	0.739	10.126	0	0.024
30	3	GNS	Both	223	3.347	0.901	10.496	0	0.02
31	3	GNS	Both	189	2.216	0.742	8.002	3.698	0.028

Table 2 a.) For each age, mCV of weight at age (CV_W), length at age (CV_L) and maturity at age (CV_Mat) achieved for **flounder,** females (F) and males (M) separated, and sampling unit “SD, gill nets (GNS) or bottom trawlers (OTB)and quarter (Q)” in R out-put format. . (AgeC) is age class and (nAge) is number of individuals in each age class in original sample. (CV_AC) is standard variation of the mean proportion of age class x in the population.

SD	Q	Gear	Sex	AgeC	nAge	CV_W%	CV_L%	CV_Sex%	CV_Mat%	CV_AC%
27	3	GNS	F	2	2	16.98	7.048	NA	0	61.967
27	3	GNS	F	3	10	5.204	1.441	NA	0	30.138
27	3	GNS	F	4	13	7.24	2.367	NA	0	27.25
27	3	GNS	F	5	47	3.351	1.288	NA	0	13.058
27	3	GNS	F	6	19	5.717	2.066	NA	0	22.224
27	3	GNS	F	7	28	3.92	0.958	NA	0	17.265
27	3	GNS	F	8	48	2.719	0.994	NA	0	13.191
27	3	GNS	F	9	12	4	1.433	NA	0	28.123
27	3	GNS	F	10	4	5.244	1.044	NA	0	48.957
27	3	GNS	F	11	8	5.41	1.696	NA	0	36.244
27	3	GNS	F	12	4	4.016	2.288	NA	0	47.386
27	3	GNS	F	13	8	6.726	1.576	NA	0	34.994
27	3	GNS	F	18	1	0	0	NA	0	84.215
27	3	GNS	M	3	4	17.418	5.256	NA	0	49.146
27	3	GNS	M	4	3	4.228	2.042	NA	0	52.368
27	3	GNS	M	5	6	6.312	2.536	NA	0	38.005
27	3	GNS	M	6	4	14.764	3.888	NA	0	47.856
27	3	GNS	M	7	6	3.116	1.681	NA	0	39.28
27	3	GNS	M	8	24	4.726	1.484	NA	0	17.897
27	3	GNS	M	9	7	12.975	3.807	NA	0	36.415
27	3	GNS	M	10	12	5.45	1.556	NA	0	27.247
27	3	GNS	M	11	7	6.654	2.059	NA	0	35.93
27	3	GNS	M	12	3	11.645	5.163	NA	0	56.076
27	3	GNS	M	13	11	5.074	1.789	NA	0	27.53
27	3	GNS	M	14	2	7.688	4.672	NA	0	62.393
27	3	GNS	M	15	1	0	0	NA	0	85.038
27	3	GNS	M	16	1	0	0	NA	0	80.862
27	3	GNS	M	17	1	0	0	NA	0	81.861
27	3	GNS	M	18	1	0	0	NA	0	79.102
27	3	GNS	M	21	1	0	0	NA	0	80.468

Table 2a. Cont.

SD	Q	Gear	Sex	AgeC	nAge	CV_W%	CV_L%	CV_Sex%	CV_Mat%	CV_AC%
25	1	OTB	F	3	3	5.726	1.03	NA	0	54.094
25	1	OTB	F	4	34	3.647	1.267	NA	0	12.832
25	1	OTB	F	5	16	7.775	2.535	NA	0	22.882
25	1	OTB	F	6	7	8.143	1.318	NA	0	36.195
25	1	OTB	F	7	13	4.165	1.481	NA	0	24.492
25	1	OTB	F	8	4	20.869	4.3	NA	0	46.819
25	1	OTB	F	9	2	13.525	0.632	NA	0	63.956
25	1	OTB	F	15	2	16.067	7.138	NA	0	62.716
25	1	OTB	M	3	41	3.173	1.064	NA	0	12.483
25	1	OTB	M	4	37	3.101	1.111	NA	0	13.582
25	1	OTB	M	5	16	3.073	1.145	NA	0	23.176
25	1	OTB	M	6	6	5.857	2.005	NA	0	38.79
25	1	OTB	M	7	13	3.72	0.987	NA	0	26.668
25	1	OTB	M	8	3	8.093	2.053	NA	0	51.853
25	1	OTB	M	10	1	0	0	NA	0	75.544
25	1	OTB	M	11	1	0	0	NA	0	79.508
25	4	OTB	F	2	5	11.311	3.94	NA	0	45.027
25	4	OTB	F	3	28	3.289	1.236	NA	0	16.698
25	4	OTB	F	4	42	3.397	1.076	NA	0	12.727
25	4	OTB	F	5	25	4.098	1.16	NA	0	17.853
25	4	OTB	F	6	5	14.068	4.342	NA	0	44.362
25	4	OTB	F	7	11	4.917	1.851	NA	0	30.127
25	4	OTB	F	8	3	11.319	4.462	NA	0	55.647
25	4	OTB	F	10	1	0	0	NA	0	83.031
25	4	OTB	F	15	1	0	0	NA	0	82.539
25	4	OTB	M	2	2	12.274	0.806	NA	0	59.392
25	4	OTB	M	3	25	3.112	1.028	NA	0	15.8
25	4	OTB	M	4	26	2.372	0.793	NA	0	15.652
25	4	OTB	M	5	10	6.978	1.894	NA	0	29.625
25	4	OTB	M	6	3	8.379	1.633	NA	0	55.179
25	4	OTB	M	7	6	6.446	2.055	NA	0	37.755
25	4	OTB	M	8	1	0	0	NA	0	77.504
25	4	OTB	M	10	1	0	0	NA	0	77.692

Table 2 b.) Grand mCV of weight at age (Weight), length at age (Length) and maturity at age (Mat) achieved for **flounder**, females (F) and males (M) separated, and sampling unit “SD, gill nets (GNS) or bottom trawlers (OTB) and quarter (Q)” in R out-put format. (Age) is the grand average of SD over all age classes of the mean proportion in age class x.

SD	Q	Gear	Sex	N	Weigth %	Length%	Sex%	Mat%	Age%
27	3	GNS	F	204	4.256	1.422	NA	0	0.025
27	3	GNS	M	94	6.563	2.202	NA	0	0.04
25	1	OTB	F	81	6.404	1.82	NA	0	0.044
25	1	OTB	M	118	3.404	1.136	NA	0	0.034
25	4	OTB	F	121	4.55	1.514	NA	0	0.037
25	4	OTB	M	74	4.019	1.136	NA	0	0.04

Table 3 a.) For each age, mCV of weight at age (CV_W) and length at age (CV_L) achieved for **silver eel**, females (F) only, and sampling unit “SD and pound nets (FPN)” in R out-put format. (AgeC) is age class and (nAge) is number of individuals in each age class in original sample. (CV_AC) is standard variation of the mean proportion of age class x in the population.

SD	Q	Gear	Sex	AgeC	nAge	CV_W%	CV_L%	CV_Sex%	CV_Mat%	CV_AC%
23	4	FPN	F	7	3	11.054	4.219	NA	NA	47.53
23	4	FPN	F	8	7	16.36	5.154	NA	NA	40.492
23	4	FPN	F	9	18	9.661	3.287	NA	NA	24.353
23	4	FPN	F	10	47	6.448	1.624	NA	NA	11.559
23	4	FPN	F	11	23	14.682	3.549	NA	NA	19.937
23	4	FPN	F	12	26	9.182	2.652	NA	NA	17.944
23	4	FPN	F	13	26	9.022	2.526	NA	NA	18.217
23	4	FPN	F	14	20	9.738	2.781	NA	NA	21.336
23	4	FPN	F	15	17	13.205	3.88	NA	NA	24.291
23	4	FPN	F	16	11	26.723	7.947	NA	NA	33.542
23	4	FPN	F	17	7	15.422	6.846	NA	NA	42.59
23	4	FPN	F	18	5	29.912	14.644	NA	NA	58.053
23	4	FPN	F	19	2	29.1	8.355	NA	NA	67.415
23	4	FPN	F	20	1	0	0	NA	NA	95.577
23	4	FPN	F	21	2	10.75	0.244	NA	NA	65.312
23	4	FPN	F	22	2	12.044	6.841	NA	NA	53.352
23	4	FPN	F	28	1	0	0	NA	NA	88.33
24	3&4	FPN	F	5	1	0	0	NA	NA	70.865
24	3&4	FPN	F	6	1	0	0	NA	NA	83.505
24	3&4	FPN	F	8	8	10.114	2.966	NA	NA	32.855
24	3&4	FPN	F	9	15	9.031	2.793	NA	NA	23.714
24	3&4	FPN	F	10	30	9.878	2.61	NA	NA	17.147
24	3&4	FPN	F	11	24	7.641	2.082	NA	NA	18.662
24	3&4	FPN	F	12	16	7.697	2.231	NA	NA	23.183
24	3&4	FPN	F	13	25	10.284	2.567	NA	NA	19.026
24	3&4	FPN	F	14	16	8.389	2.909	NA	NA	24.033
24	3&4	FPN	F	15	23	8.357	2.545	NA	NA	19.561
24	3&4	FPN	F	16	18	8.224	2.894	NA	NA	21.311
24	3&4	FPN	F	17	12	11.167	3.545	NA	NA	31.406
24	3&4	FPN	F	18	11	11.735	3.676	NA	NA	28.583
24	3&4	FPN	F	19	3	17.787	5.742	NA	NA	59.51
24	3&4	FPN	F	20	4	12.168	4.935	NA	NA	51.407
24	3&4	FPN	F	22	1	0	0	NA	NA	94.397

Table 3a. Cont.

SD	Q	Gear	Sex	AgeC	nAge	CV_W%	CV_L%	CV_Sex%	CV_Mat%	CV_AC%
25	3&4	FPN	F	8	5	20.835	6.122	NA	NA	45.296
25	3&4	FPN	F	9	8	11.989	3.24	NA	NA	34.768
25	3&4	FPN	F	10	16	10.214	2.884	NA	NA	24.698
25	3&4	FPN	F	11	11	7.719	2.762	NA	NA	28.851
25	3&4	FPN	F	12	11	7.017	2.037	NA	NA	29.645
25	3&4	FPN	F	13	16	9.773	3.346	NA	NA	24.821
25	3&4	FPN	F	14	32	5.08	1.608	NA	NA	15.747
25	3&4	FPN	F	15	11	7.259	2.646	NA	NA	28.853
25	3&4	FPN	F	16	37	4.222	1.431	NA	NA	14.759
25	3&4	FPN	F	17	10	6.565	1.619	NA	NA	30.541
25	3&4	FPN	F	18	21	7.03	1.9	NA	NA	20.959
25	3&4	FPN	F	19	8	14.333	5.488	NA	NA	34.98
25	3&4	FPN	F	20	9	11.976	4.457	NA	NA	31.846
25	3&4	FPN	F	21	3	9.55	3.783	NA	NA	53.388
25	3&4	FPN	F	23	1	0	0	NA	NA	81.856
25	3&4	FPN	F	24	1	0	0	NA	NA	81.979
27	3	FPN	F	9	3	16.672	2.922	NA	NA	77.782
27	3	FPN	F	10	9	11.723	3.607	NA	NA	38.297
27	3	FPN	F	11	10	7.447	2.464	NA	NA	30.155
27	3	FPN	F	12	16	8.771	2.306	NA	NA	25.138
27	3	FPN	F	13	14	5.988	1.803	NA	NA	23.774
27	3	FPN	F	14	39	4.237	1.207	NA	NA	14.122
27	3	FPN	F	15	23	4.733	1.654	NA	NA	20.455
27	3	FPN	F	16	22	4.728	1.512	NA	NA	18.52
27	3	FPN	F	17	18	6.67	2.035	NA	NA	24.801
27	3	FPN	F	18	18	3.832	1.352	NA	NA	20.62
27	3	FPN	F	19	6	11.698	3.589	NA	NA	39.41
27	3	FPN	F	20	6	14.665	3.404	NA	NA	44.297
27	3	FPN	F	21	2	3.786	1.395	NA	NA	56.894
27	3	FPN	F	22	1	0	0	NA	NA	96.983
27	3	FPN	F	23	2	22.968	9.116	NA	NA	69.226
27	3	FPN	F	25	1	0	0	NA	NA	131.569

Table 3 b.) Grand mCV of weight at age (Weight) and length at age (Length) achieved for **silver eel**, females (F) only, and sampling unit "SD and pound nets (FPN)" in R out-put format. (Age) is the grand average of SD over all age classes of the mean proportion in age class x.

SD	Q	Gear	Sex	Other	N	Weigth%	Length%	Sex%	Mat%	Age%
23	4	FPN	F	No	218	10.806	3.205	NA	NA	0.017
24	3&4	FPN	F	No	208	9.12	2.715	NA	NA	0.017
25	3&4	FPN	F	No	201	7.679	2.455	NA	NA	0.016
27	3	FPN	F	No	190	6.149	1.866	NA	NA	0.013

Table 4 a.) For each age, mCV of weight at age (CV_W) and length at age (CV_L) achieved for **yellow eel**, females (F) only, and sampling unit “SD and fyke nets (FYK)” in R out-put format. . (AgeC) is age class and (nAge) is number of individuals in each age class in original sample. (CV_AC) is standard variation of the mean proportion of age class x in the population.

SD	Q	Gear	Sex	AgeC	nAge	CV_W%	CV_L%	CV_Sex%	CV_Mat%	CV_AC%
20	2	FYK	F	4	1	0	0	NA	NA	87.295
20	2	FYK	F	5	2	49.14	19.793	NA	NA	76.002
20	2	FYK	F	6	1	0	0	NA	NA	53.299
20	2	FYK	F	7	23	9.058	2.718	NA	NA	19.673
20	2	FYK	F	8	64	4.995	1.394	NA	NA	8.5
20	2	FYK	F	9	11	27.557	7.383	NA	NA	31.176
20	2	FYK	F	10	38	7.722	2.307	NA	NA	15.28
20	2	FYK	F	11	28	12.44	3.643	NA	NA	21.374
20	2	FYK	F	12	13	18.369	4.893	NA	NA	30.735
20	2	FYK	F	13	6	24.909	7.04	NA	NA	49.861
20	2	FYK	F	14	3	33.136	6.141	NA	NA	65.176
20	2	FYK	F	15	1	0	0	NA	NA	97.572
20	2	FYK	F	16	2	29.21	9.169	NA	NA	73.671
20	2	FYK	F	17	1	0	0	NA	NA	97.778
20	2	FYK	F	21	1	0	0	NA	NA	97.961
20	3	FYK	F	4	3	11.13	4.546	NA	NA	61.186
20	3	FYK	F	5	11	15.673	5.273	NA	NA	35.04
20	3	FYK	F	6	10	7.896	2.769	NA	NA	27.759
20	3	FYK	F	7	41	4.756	1.405	NA	NA	12.886
20	3	FYK	F	8	67	4.029	1.137	NA	NA	8.901
20	3	FYK	F	9	22	10.878	3.204	NA	NA	20.719
20	3	FYK	F	10	41	8.977	2.522	NA	NA	17.534
20	3	FYK	F	11	25	10.468	3.446	NA	NA	23.776
20	3	FYK	F	12	11	15.402	4.646	NA	NA	36.422
20	3	FYK	F	13	8	16.535	4.443	NA	NA	43.71
20	3	FYK	F	14	1	0	0	NA	NA	98.147
20	3	FYK	F	16	2	6.169	1.754	NA	NA	79.675
21	2&3	FYK	F	3	1	0	0	NA	NA	105.376
21	2&3	FYK	F	4	4	16.681	6.837	NA	NA	58.373
21	2&3	FYK	F	5	7	13.573	4.867	NA	NA	43.978
21	2&3	FYK	F	6	3	31.246	9.151	NA	NA	62.467
21	2&3	FYK	F	7	32	6.072	2.145	NA	NA	16.754
21	2&3	FYK	F	8	43	6.706	1.758	NA	NA	13.323
21	2&3	FYK	F	9	27	9.209	2.54	NA	NA	17.002
21	2&3	FYK	F	10	60	5.509	1.332	NA	NA	10.667
21	2&3	FYK	F	11	36	7.468	1.902	NA	NA	15.555
21	2&3	FYK	F	12	19	14.801	3.164	NA	NA	22.207
21	2&3	FYK	F	13	9	19.363	5.258	NA	NA	37.911
21	2&3	FYK	F	14	7	24.513	6.526	NA	NA	42.503
21	2&3	FYK	F	15	7	27.55	4.858	NA	NA	41.372
21	2&3	FYK	F	16	6	33.168	8.946	NA	NA	44.106
21	2&3	FYK	F	17	2	37.331	12.53	NA	NA	64.424
21	2&3	FYK	F	18	3	16.375	3.518	NA	NA	66.351

Table 4 a. Cont

SD	Q	Gear	Sex	AgeC	nAge	CV_W%	CV_L%	CV_Sex%	CV_Mat%	CV_AC%
23	2&3	FYK	F	2	1	0	0	NA	NA	101.441
23	2&3	FYK	F	3	31	4.681	1.327	NA	NA	14.586
23	2&3	FYK	F	4	18	6.73	1.869	NA	NA	17.903
23	2&3	FYK	F	5	39	8.77	2.134	NA	NA	13.364
23	2&3	FYK	F	6	8	15.412	5.154	NA	NA	33.993
23	2&3	FYK	F	7	29	9.956	3.058	NA	NA	17.64
23	2&3	FYK	F	8	31	11.867	3.244	NA	NA	19.617
23	2&3	FYK	F	9	23	18.138	4.268	NA	NA	22.032
23	2&3	FYK	F	10	32	8.17	1.953	NA	NA	20.076
23	2&3	FYK	F	11	9	23.016	4.681	NA	NA	37.681
23	2&3	FYK	F	12	2	31.378	8.594	NA	NA	66.492
27	3	FYK	F	3	1	0	0	NA	NA	84.774
27	3	FYK	F	4	6	12.388	3.952	NA	NA	38.623
27	3	FYK	F	5	3	22.094	5.908	NA	NA	54.349
27	3	FYK	F	6	3	20.054	7.374	NA	NA	52.224
27	3	FYK	F	7	4	35.734	10.095	NA	NA	49.238
27	3	FYK	F	8	13	10.956	3.048	NA	NA	26.188
27	3	FYK	F	9	22	10.933	3.078	NA	NA	19.151
27	3	FYK	F	10	54	7.211	1.844	NA	NA	11.197
27	3	FYK	F	11	26	8.709	2.193	NA	NA	17.806
27	3	FYK	F	12	19	10.886	2.956	NA	NA	21.956
27	3	FYK	F	13	10	14.037	4.634	NA	NA	31.066
27	3	FYK	F	14	7	13.297	3.46	NA	NA	38.734
27	3	FYK	F	15	5	14.506	4.324	NA	NA	42.691
27	3	FYK	F	16	4	3.822	1.279	NA	NA	48.549
27	3	FYK	F	17	1	0	0	NA	NA	80.156
27	3	FYK	F	18	3	13.15	3.971	NA	NA	55.238
27	3	FYK	F	21	1	0	0	NA	NA	82.055

Table 4 b.) Grand mCV of weight at age (Weight) and length at age (Length) achieved for **yellow eel**, females only) and sampling unit "SD and fyke nets (FYK)" in R out-put format. (Age) is the grand average of SD over all age classes of the mean proportion in age class x.

SD	Q	Gear	Sex	Other	N	Weigth%	Length%	Sex%	Mat%	Age%
20	2	FYK	F	No	195	9.442	2.694	NA	NA	0.016
20	3	FYK	F	No	242	7.067	2.124	NA	NA	0.014
21	2&3	FYK	F	No	266	9.501	2.507	NA	NA	0.015
23	2&3	FYK	F	No	223	9.92	2.608	NA	NA	0.026
27	3	FYK	F	No	182	10.496	2.93	NA	NA	0.019

Table 5 a.) For each age, mCV of weight at age (CV_W), length at age (CV_L) and sex-ratio (CV_Sex) at age achieved for **Salmon** and sampling unit either “SD, area in SD and trap nets (FPO) or “long lines (LLD)” in R out-put format. (AgeC) is age class and (nAge) is number of individuals in each age class in original sample. (CV_AC) is standard variation of the mean proportion of age class x in the population.

SD	Q	Gear	Sex	Area	AgeC	nAge	CV_W%	CV_L%	CV_Sex%	CV_Mat%	CV_AC%
30	2&3	FPO	Both	Skeppsmalen	1	1	0	0	0	NA	81.892
30	2&3	FPO	Both	Skeppsmalen	2	69	2.529	0.864	2.941	NA	5.158
30	2&3	FPO	Both	Skeppsmalen	3	9	10.913	4.371	0	NA	30.298
30	2&3	FPO	Both	Skeppsmalen	4	5	6.414	2.444	0	NA	43.285
30	2&3	FPO	Both	Skeppsmalen	5	1	0	0	0	NA	79.672
31	2&3	FPO	Both	Skellefteå archipelago	1	39	4.934	1.135	4.83	NA	14.306
31	2&3	FPO	Both	Skellefteå archipelago	2	154	2.058	0.621	3.356	NA	4.729
31	2&3	FPO	Both	Skellefteå archipelago	3	30	3.978	1.344	9.255	NA	16.762
31	2&3	FPO	Both	Skellefteå archipelago	4	7	9.722	2.164	14.149	NA	37.076
31	2&3	FPO	Both	Seskarö Furö	1	13	10.624	2.702	7.573	NA	26.33
31	2&3	FPO	Both	Seskarö Furö	2	72	3.116	0.846	4.971	NA	6.495
31	2&3	FPO	Both	Seskarö Furö	3	9	9.127	3.658	14.684	NA	32.366
31	2&3	FPO	Both	Seskarö Furö	4	3	3.87	0.314	0	NA	54.673
31	2&3	FPO	Both	Seskarö Furö	5	5	9.646	1.418	25.462	NA	43.939
31	2&3	FPO	Both	Seskarö Furö	6	1	0	0	0	NA	79.002
25-26	4	LLD	NA		0	6	13.817	5.282	NA	NA	40.878
25-26	4	LLD	NA		1	115	2.596	0.838	NA	NA	5.794
25-26	4	LLD	NA		2	46	4.464	1.389	NA	NA	13.037
25-26	4	LLD	NA		3	18	5.067	1.115	NA	NA	21.265
25-26	4	LLD	NA		4	1	0	0	NA	NA	82.44

Table 5 b.) Grand mCV of weight at age (Weight), length at age (Length) and sex-ratio at age (Sex) achieved for **Salmon** and sampling unit either “SD, area in SD and trap nets (FPO)” or “long lines (LLD)” in R out-put format. (Age) is the grand average of SD over all age classes of the mean proportion in age class x.

SD	Q	Gear	Sex	Area	N	Weigth%	Length%	Sex%	Mat%	Age%
30	2&3	FPO	Both	Skeppsmalen	85	3.585	1.308	2.388	NA	0.031
31	2&3	FPO	Both	Skellefteå archipelago	230	3.024	0.848	4.696	NA	0.02
31	2&3	FPO	Both	Seskarö Furö	103	4.882	1.325	6.926	NA	0.041
25-26	4	LLD	NA		186	3.65	1.141	NA	NA	0.037

Annex I b

Estimation of mean CV for herring, sprat and cod in the Baltic, and mean CV for herring, sprat, cod, plaice, haddock and witch flounder in the North Sea and East Arctic

Here details regarding the precision levels given in ***Table III.E.3 - Sampling intensity for stock-based variables in section III.E Biological – stock-related variables*** *are presented.*

Method for estimation of mCV for weight, length, sex-ratio respectively maturity at age
Sampling for herring, sprat and cod is based on random samples app 400 – 650 individuals per unit (stock, quarter, gear). However, since there are very few samples per stratum (subdivision, gear, and quarter), analytical methods for calculating coefficient of variation (CV) is not appropriate, and the bootstrap method was used instead (see WKSCMFD 2004).

When calculating mean CV (mCV), stock and quarter was considered as the standard sampling unit. We have from a sample unit of *n* individuals made bootstrap samples of *n* individuals of the original data. For each bootstrap sample we calculated mean weight, length, sex ratio and maturity at age. The bootstrap sampling was repeated 100 times for each data set. We calculated the dispersion of mean values as the standard deviation across all bootstrap samples. However, as dispersion tend to increase with increasing size of individuals we, for weight and length at age, divided the standard deviation with mean values of weight and length at class, respectively. This is our estimated mCV. Note that we did not do this correction for sex ratio and maturity as there is no reason to believe dispersion should change with mean values in any systematic way as these were proportions. Instead we kept standard deviation of the means over all 100 bootstrap sample as our estimate of dispersion of mean values.

The estimated mCVs at each age are presented for each species and sampling unit in **Tables 1-9 (a)** below.

The mCV for each stock and quarter was calculated as a grand average of mCV from each age class, weighted for how many individuals there were in the different age classes. Hence, we used data from all age classes but weighted data relative to the abundance in each age class. Estimated grand mCV for each sampling unit is presented in **Tables 1-9 (b).**

The “Achieved precision target (CV)” in AR Table III.E.3 was then calculated as the average of mCV values over all quarters for each species,.

The mCV for each stock and quarter was calculated as a grand average of mCV from each age class, weighted for how many individuals there were in the different age classes

During surveys, herring, sprat, cod, plaice, haddock and witch flounder are sampled with length stratified sampling method (ALK method). Boot strap method was used to calculate mean weight, length, sex ratio and maturity at age and the bootstrap sampling was repeated 100 times for each data set. Only data from surveys conducted during quarter 1 was included in the CV calculations, except from the Acoustic survey (BIAS). The estimated mCVs at each age are presented for each stock by survey in **Tables 10 - 12** below. The mCV for each stock and survey was calculated as a grand average of mCV from each age class, weighted for how many individuals there were in the different age classes and the value is presented in table III.E.3.

Table 1 a Herring sd25-29 mCV of weight at age (CV_W), length at age (CV_L), sex-ratio (CV_Sex) at age and maturity at age (CV_Mat) achieved in R out-put format. (AgeC) is age class and (nAge) is number of individuals in each age class in original sample. (CV_AC) is standard variation of the mean proportion of age class x in the population.

SD	Sex	Q	Age C	N Age	CV_W %	CV_L %	CV_Sex %	CV_Mat %	CV_AC %
sd2529	Both	Q1	1	18	11.216	4.581	13.482	0.000	30.409
sd2529	Both	Q1	2	199	3.425	1.053	2.387	3.994	5.576
sd2529	Both	Q1	3	444	2.460	0.680	3.155	1.579	3.720
sd2529	Both	Q1	4	310	2.447	0.689	2.581	0.470	5.691
sd2529	Both	Q1	5	251	3.207	0.772	4.079	0.414	6.354
sd2529	Both	Q1	6	133	2.555	0.702	5.195	0.000	6.986
sd2529	Both	Q1	7	217	1.504	0.582	2.270	0.000	7.862
sd2529	Both	Q1	8	144	2.385	0.732	3.269	0.000	4.991
sd2529	Both	Q1	9	24	12.439	2.842	13.338	0.000	15.967
sd2529	Both	Q1	10	9	6.779	2.515	15.482	0.000	21.579
sd2529	Both	Q1	11	2	1.010	5.966	NA	0.000	116.369
sd2529	Both	Q1	12	1	0.000	0.000	0.000	0.000	91.287
sd2529	Both	Q1	13	2	8.885	6.019	46.647	0.000	49.943
sd2529	Both	Q2	0	2	9.118	1.885	NA	0.000	38.344
sd2529	Both	Q2	1	12	10.545	4.161	9.942	0.000	28.545
sd2529	Both	Q2	2	100	5.119	1.444	4.298	2.515	8.064
sd2529	Both	Q2	3	304	2.541	0.704	2.699	0.810	3.427
sd2529	Both	Q2	4	200	2.637	0.597	5.199	1.207	5.464
sd2529	Both	Q2	5	194	2.687	0.879	3.680	0.000	5.226
sd2529	Both	Q2	6	170	2.737	0.912	3.951	0.609	6.845
sd2529	Both	Q2	7	182	3.336	0.922	4.212	0.000	9.595
sd2529	Both	Q2	8	105	2.642	0.694	3.922	0.834	11.765
sd2529	Both	Q2	9	29	6.476	2.412	4.478	0.000	19.839
sd2529	Both	Q2	10	20	7.041	2.328	10.634	0.000	17.834
sd2529	Both	Q2	11	4	17.977	6.456	20.580	0.000	63.532
sd2529	Both	Q2	12	1	0	0	0	0	123.237
sd2529	Both	Q2	13	1	0	0	0	0	47.14
sd2529	Both	Q2	14	1	0	0	0	0	68.465
sd2529	Both	Q2	15	1	0	0	0	0	60.858
sd2529	Both	Q3	0	1	0	0	0	0	70.638
sd2529	Both	Q3	1	37	4.087	0.958	9.625	7.524	13.032
sd2529	Both	Q3	2	91	5.003	1.463	4.973	4.274	10.927
sd2529	Both	Q3	3	246	2.977	0.88	2.625	2.726	5.017
sd2529	Both	Q3	4	151	3.74	0.969	5.191	2.972	10.324
sd2529	Both	Q3	5	111	4.455	0.957	4.994	2.719	9.379
sd2529	Both	Q3	6	62	3.902	1.084	5.2	3.195	10.871
sd2529	Both	Q3	7	65	3.967	1.103	5.371	0	12.501
sd2529	Both	Q3	8	19	3.897	1.686	12.361	0	16.913
sd2529	Both	Q3	9	4	13.717	6.342	28.057	0	44.646
sd2529	Both	Q3	10	1	0	0	0	0	83.669
sd2529	Both	Q3	13	1	0	0	0	0	83.84
sd2529	Both	Q4	0	16	5.103	1.377	10.138	0	25.046
sd2529	Both	Q4	1	65	2.465	0.765	5.165	5.304	13.732
sd2529	Both	Q4	2	133	3.892	1.418	4.685	3.242	7.42
sd2529	Both	Q4	3	227	3.277	0.897	3.243	2.07	4.911
sd2529	Both	Q4	4	178	2.922	0.717	3.573	1.931	6.621
sd2529	Both	Q4	5	113	4.366	1.092	5.197	1.353	7.276
sd2529	Both	Q4	6	85	3.771	1.074	6.36	1.878	9.595
sd2529	Both	Q4	7	83	2.573	0.82	4.782	1.139	10.621
sd2529	Both	Q4	8	31	3.899	1.365	9.912	0	14.802

sd2529	Both	Q4	9	7	6.551	2.523	13.926	0	35.771
sd2529	Both	Q4	10	1	0	0	0	0	79.04
sd2529	Both	Q4	12	1	0	0	0	0	79.48

Table 1b. Herring sd25-29. Grand mCV of weight at age (Weight), length at age (Length) and maturity at age (Mat) in R out-put format. (Age) is the grand average of SD over all age classes of the mean proportion in age class x.

SD	Sex	Q	N	Weight %	Length %	Sex	Mat	Age
sd2529	Both	Q1	1754	2.802	0.817	NA	1.017	0.007
sd2529	Both	Q2	1326	3.17	0.928	NA	0.694	0.011
sd2529	Both	Q3	789	3.838	1.059	4.841	2.902	0.013
sd2529	Both	Q4	940	3.419	0.993	4.702	2.126	0.018

Table 2a. Herring sd22-24

SD	Sex	Q	AgeC	N Age	CV_W %	CV_L %	CV_Sex %	CV_Mat %	CV_AC %
sd24	Both	Q1	1	12	7.277	1.875	13.587	0	29.123
sd24	Both	Q1	2	251	1.994	0.57	3.156	3.291	5.314
sd24	Both	Q1	3	187	2.014	0.582	4.087	1.086	6.476
sd24	Both	Q1	4	129	2.226	0.649	5.1	1.181	8.237
sd24	Both	Q1	5	71	2.943	0.784	5.857	0	9.517
sd24	Both	Q1	6	29	5.214	1.334	9.259	0	15.052
sd24	Both	Q1	7	13	7.195	2.402	15.602	0	27.765
sd24	Both	Q1	8	5	23.186	6.289	21.084	0	35.214
sd24	Both	Q1	10	1	0	0	0	0	77.044
sd24	Both	Q1	11	1	0	0	0	0	61.52
sd24	Both	Q2	1	51	2.603	0.863	7.227	0	13.938
sd24	Both	Q2	2	78	3.385	1.113	5.062	4.737	9.685
sd24	Both	Q2	3	107	2.764	0.822	3.863	1.207	7.545
sd24	Both	Q2	4	45	6.906	1.929	6.736	0	13.286
sd24	Both	Q2	5	17	14.476	4.706	11.932	0	29.095
sd24	Both	Q2	6	6	26.206	6.291	25.13	16.953	40.39
sd24	Both	Q2	7	2	18.702	3.545	0	0	65.416
sd24	Both	Q2	8	2	33.173	5.3	0	0	59.032
sd24	Both	Q4	0	22	4.46	1.109	NA	0	23.592
sd24	Both	Q4	1	102	1.965	0.676	5.037	4.852	7.878
sd24	Both	Q4	2	94	3.683	1.023	5.836	3.112	7.734
sd24	Both	Q4	3	116	5.002	1.51	5.015	2.554	8.311
sd24	Both	Q4	4	58	8.338	2.442	7.005	3.41	14.175
sd24	Both	Q4	5	40	11.536	3.259	7.694	3.318	17.567
sd24	Both	Q4	6	18	16.593	4.612	9.951	6.336	22.14
sd24	Both	Q4	7	6	26.415	8.281	22.204	0	41.516
sd24	Both	Q4	8	6	10.075	4.109	19.554	0	39.397
sd24	Both	Q4	10	1	0	0	0	0	66.901

Table 2b Herring sd22-24

SD	Sex	Q	N	% Weight	% Length	% Sex	% Mat	% Age
sd24	Both	Q1	699	2.611	0.739	4.829	1.695	0.016
sd24	Both	Q2	308	4.805	1.407	5.899	1.984	0.027
sd24	Both	Q4	463	5.796	1.713	NA	3.294	0.031

Table 3a Sprat IIIb-d

SD	Sex	Q	AgeC	NAge	CV_W %	CV_L %	CV_Sex %	CV_Mat %	CV_AC %
IIId	Both	Q1	1	48	2.826	0.745	8.501	7.542	15.945
IIId	Both	Q1	2	1397	0.728	0.212	1.137	0.738	1.725
IIId	Both	Q1	3	260	1.619	0.448	2.889	0.732	5.789
IIId	Both	Q1	4	395	1.329	0.387	2.388	0.418	4.563
IIId	Both	Q1	5	88	2.701	0.825	4.755	1.092	8.474
IIId	Both	Q1	6	66	4.826	1.155	7.828	1.501	11.38
IIId	Both	Q1	7	81	2.834	0.748	5.861	0	10.79
IIId	Both	Q1	8	35	4.392	1.172	8.271	0	14.271
IIId	Both	Q1	9	3	6.794	4.154	30.784	0	57.744
IIId	Both	Q1	10	2	12.314	1.342	0	0	59.517
IIId	Both	Q1	11	1	0	0	0	0	86.566
IIId	Both	Q2	1	11	5.788	1.602	15.248	12.168	35.151
IIId	Both	Q2	2	466	1.198	0.414	2.272	0.899	3.396
IIId	Both	Q2	3	115	2.722	0.759	4.478	1.869	9.778
IIId	Both	Q2	4	138	2.076	0.584	3.999	1.258	9.015
IIId	Both	Q2	5	35	3.694	1.093	7.116	0	17.584
IIId	Both	Q2	6	25	5.034	1.248	5.887	0	22.15
IIId	Both	Q2	7	26	5.958	1.841	10.868	3.391	17.894
IIId	Both	Q2	8	19	6.714	1.566	9.501	0	21.97
IIId	Both	Q2	9	1	0	0	0	0	65.555
IIId	Both	Q2	10	3	18.424	6.763	0	0	53.729
IIId	Both	Q3	1	28	1.904	0.798	7.994	NA	17.519
IIId	Both	Q3	2	81	1.619	0.63	4.281	NA	10.754
IIId	Both	Q3	3	82	2.36	0.88	4.431	NA	8.798
IIId	Both	Q3	4	65	2.197	0.806	5.703	NA	9.111
IIId	Both	Q3	5	14	3.625	1.465	9.057	NA	24.059
IIId	Both	Q3	6	11	6.989	2.077	14.586	NA	26.207
IIId	Both	Q3	7	19	3.379	1.714	11.212	NA	25.504
IIId	Both	Q3	8	7	6.573	1.77	19.714	NA	37.192
IIId	Both	Q3	10	1	0	0	0	NA	67.329
IIId	Both	Q4	0	20	4.785	1.676	16.482	NA	22.751
IIId	Both	Q4	1	129	1.928	0.517	4.001	NA	10.003
IIId	Both	Q4	2	647	0.712	0.223	1.878	NA	2.489
IIId	Both	Q4	3	186	1.488	0.518	3.731	NA	8.2
IIId	Both	Q4	4	126	1.624	0.504	3.861	NA	6.195
IIId	Both	Q4	5	33	2.634	0.957	7.936	NA	17.128
IIId	Both	Q4	6	34	3.122	1.008	8.206	NA	17.079
IIId	Both	Q4	7	27	2.728	0.877	7.857	NA	18.631
IIId	Both	Q4	8	7	12.113	3.365	17.249	NA	45.904
IIId	Both	Q4	9	3	5.157	2.79	31.412	NA	58.784
IIId	Both	Q4	10	4	7.046	1.683	23.277	NA	43.891
IIId	Both	Q4	13	2	3.172	1.426	0	NA	65.968
IIId	Both	Q4	15	1	0	0	0	NA	67.274

Table 3b Sprat IIIb-d

SD	Sex	Q	N	Weight %	Length %	Sex %	Mat %	Age %
IIId	Both	Q1	2376	1.296	0.365	2.305	0.817	0.009
IIId	Both	Q2	839	2.166	0.651	3.764	1.222	0.02
IIId	Both	Q3	308	2.438	0.921	6.26	NA	0.023
IIId	Both	Q4	1219	1.378	0.437	3.51	NA	0.014

Table 4a Cod sd2224

SD	Sex	Q	AgeC	AntAge	CV_W %	CV_L %	CV_Sex	CV_Mat	CV_AC
sd2224	Both	Q1	2	7	10.078	3.245	NA	NA	32.438
sd2224	Both	Q1	3	15	18.322	4.677	NA	NA	23
sd2224	Both	Q1	4	32	7.454	2.783	NA	NA	17.964
sd2224	Both	Q1	5	56	4.896	1.878	NA	NA	11.698
sd2224	Both	Q1	6	44	5.516	1.943	NA	NA	11.191
sd2224	Both	Q1	7	20	7.623	2.648	NA	NA	16.317
sd2224	Both	Q1	8	2	2.821	1.237	NA	NA	68.509
sd2224	Both	Q1	9	4	13.129	4.013	NA	NA	47.276
sd2224	Both	Q2	2	17	9.331	2.899	NA	NA	26.64
sd2224	Both	Q2	3	81	4.735	1.815	NA	NA	10.088
sd2224	Both	Q2	4	77	3.489	1.281	NA	NA	9.91
sd2224	Both	Q2	5	64	5.414	1.743	NA	NA	8.745
sd2224	Both	Q2	6	44	6.658	2.079	NA	NA	14.215
sd2224	Both	Q2	7	10	15.473	5.003	NA	NA	24.394
sd2224	Both	Q2	8	6	9.109	1.519	NA	NA	37.922
sd2224	Both	Q2	9	2	7.638	5.077	NA	NA	71.823
sd2224	Both	Q2	11	1	0	0	NA	NA	93.169
sd2224	Both	Q3	1	5	6.27	1.924	NA	NA	47.532
sd2224	Both	Q3	2	63	5.923	1.607	NA	NA	12.082
sd2224	Both	Q3	3	99	5.74	1.924	NA	NA	8.321
sd2224	Both	Q3	4	125	3.035	0.92	NA	NA	7.29
sd2224	Both	Q3	5	69	5.588	1.669	NA	NA	10.87
sd2224	Both	Q3	6	72	4.45	1.457	NA	NA	12.603
sd2224	Both	Q3	7	23	9.07	2.77	NA	NA	16.745
sd2224	Both	Q3	8	10	10.564	3.492	NA	NA	29.885
sd2224	Both	Q3	9	1	0	0	NA	NA	62.73
sd2224	Both	Q4	2	35	9.405	2.857	NA	NA	13.419
sd2224	Both	Q4	3	69	7.413	2.476	NA	NA	11.148
sd2224	Both	Q4	4	90	3.475	1.105	NA	NA	7.206
sd2224	Both	Q4	5	65	4.044	1.36	NA	NA	12.602
sd2224	Both	Q4	6	54	5.986	1.692	NA	NA	12.619
sd2224	Both	Q4	7	24	7.342	2.569	NA	NA	17.622
sd2224	Both	Q4	8	11	15.847	4.166	NA	NA	30.467
sd2224	Both	Q4	11	2	25.827	8.128	NA	NA	74.748

Table 4b Cod sd2224

SD	Sex	Q	Antal	% Weight	% Length	% Sex	% Mat	% Age
sd2224	Both	Q1	180	7.321	2.477	NA	NA	0.018
sd2224	Both	Q2	302	5.547	1.879	NA	NA	0.018
sd2224	Both	Q3	467	5.076	1.573	NA	NA	0.02
sd2224	Both	Q4	350	6.113	1.923	NA	NA	0.018

Table 5a Cod sd2529

SD	Sex	Q	AgeC	AntAge	CV_W %	CV_L %	CV_Sex %	CV_Mat %	CV_AC %
sd2529	Both	Q1	3	39	11.675	2.991	NA	NA	15.272
sd2529	Both	Q1	4	107	6.374	1.98	NA	NA	8.862
sd2529	Both	Q1	5	49	7.944	3.052	NA	NA	14.149
sd2529	Both	Q1	6	60	5.881	2.369	NA	NA	12.789
sd2529	Both	Q1	7	42	6.143	1.753	NA	NA	17.837
sd2529	Both	Q1	8	23	8.957	2.278	NA	NA	19.958
sd2529	Both	Q1	9	8	8.665	2.983	NA	NA	32.903
sd2529	Both	Q1	10	1	0	0	NA	NA	86.891
sd2529	Both	Q1	11	1	0	0	NA	NA	87.119
sd2529	Both	Q2	2	1	0	0	NA	NA	72.532
sd2529	Both	Q2	3	19	12.342	2.932	NA	NA	22.369
sd2529	Both	Q2	4	82	5.758	2.207	NA	NA	9.929
sd2529	Both	Q2	5	66	5.711	2.042	NA	NA	9.88
sd2529	Both	Q2	6	60	4.241	1.412	NA	NA	11.976
sd2529	Both	Q2	7	39	4.341	1.692	NA	NA	15.13
sd2529	Both	Q2	8	22	8.831	2.517	NA	NA	16.909
sd2529	Both	Q2	9	4	25.96	9.14	NA	NA	50.995
sd2529	Both	Q2	10	2	29.577	5.177	NA	NA	60.346
sd2529	Both	Q3	2	25	5.813	1.678	NA	NA	20.502
sd2529	Both	Q3	3	77	8.542	2.206	NA	NA	9.345
sd2529	Both	Q3	4	117	4.304	1.557	NA	NA	8.643
sd2529	Both	Q3	5	66	4.529	1.317	NA	NA	10.486
sd2529	Both	Q3	6	45	4.788	1.546	NA	NA	14.859
sd2529	Both	Q3	7	31	5.998	2.05	NA	NA	17.95
sd2529	Both	Q3	8	13	12.681	3.557	NA	NA	27.562
sd2529	Both	Q3	9	2	3.996	1.172	NA	NA	59.43
sd2529	Both	Q3	10	3	15.326	4.571	NA	NA	46.739
sd2529	Both	Q3	12	1	0	0	NA	NA	74.049
sd2529	Both	Q4	2	19	5.125	1.624	NA	NA	23.956
sd2529	Both	Q4	3	106	3.513	0.982	NA	NA	8.167
sd2529	Both	Q4	4	115	3.661	1.289	NA	NA	9.705
sd2529	Both	Q4	5	41	5.725	1.762	NA	NA	15.144
sd2529	Both	Q4	6	45	5.721	1.904	NA	NA	15.581
sd2529	Both	Q4	7	54	3.068	1.079	NA	NA	12.034
sd2529	Both	Q4	8	25	6.235	2.016	NA	NA	18.659
sd2529	Both	Q4	9	5	13.896	4.322	NA	NA	39.107
sd2529	Both	Q4	11	1	0	0	NA	NA	92.87

Table 5b Cod sd25-29

SD	Sex	Q	N	Weight %	Length %	Sex %	Mat %	Age %
sd2529	Both	Q1	330	7.299	2.327	NA	NA	0.02
sd2529	Both	Q2	295	6.291	2.109	NA	NA	0.015
sd2529	Both	Q3	380	5.853	1.78	NA	NA	0.017
sd2529	Both	Q4	411	4.323	1.393	NA	NA	0.016

Table 6a Herring IIIa

SD	sex	Q	AgeC	N Age	CV_W %	CV_L %	CV_Sex %	CV_Mat %	CV_AC
IIIa	Both	Q1	1	55	2.951	0.877	5.691	0	14.126
IIIa	Both	Q1	2	1055	0.786	0.222	1.462	0.448	1.657
IIIa	Both	Q1	3	132	2.145	0.616	3.838	1.929	8.771
IIIa	Both	Q1	4	52	3.269	1.162	6.394	3.335	13.383
IIIa	Both	Q1	5	42	2.812	0.734	8.197	0	15.952
IIIa	Both	Q1	6	25	3.264	0.772	9.089	0	19.332
IIIa	Both	Q1	7	24	2.753	0.768	8.735	0	20.416
IIIa	Both	Q1	8	4	8.901	1.057	24.176	0	54.734
IIIa	Both	Q1	9	6	5.084	1.867	24.412	0	44.784
IIIa	Both	Q2	1	23	3.569	1.347	5.992	0	20.25
IIIa	Both	Q2	2	536	1.192	0.363	1.913	0.907	2.207
IIIa	Both	Q2	3	66	2.236	0.688	5.956	3.243	13.545
IIIa	Both	Q2	4	40	3.293	0.983	9.216	0	16.437
IIIa	Both	Q2	5	13	3.866	1.467	17.609	0	33.416
IIIa	Both	Q2	6	5	11.817	3.015	24.501	0	41.965
IIIa	Both	Q2	7	11	6.895	2.339	16.151	0	29.476
IIIa	Both	Q2	8	2	1.65	1.23	37.515	0	61.033
IIIa	Both	Q3	1	695	0.647	0.169	1.522	0.338	2.544
IIIa	Both	Q3	2	237	1.546	0.399	3.589	3.142	6.342
IIIa	Both	Q3	3	160	2.052	0.524	4.157	3.603	8.9
IIIa	Both	Q3	4	42	4.293	1.235	7.564	9.072	12.7
IIIa	Both	Q3	5	16	5.407	1.398	12.451	8.773	21.507
IIIa	Both	Q3	6	8	8.304	3.075	16.925	12.199	31.641
IIIa	Both	Q3	7	6	7.519	2.46	18.19	23.778	41.978
IIIa	Both	Q3	8	6	4.248	0.775	19.745	0	38.728
IIIa	Both	Q4	0	3	5.507	1.559	0	0	47.577
IIIa	Both	Q4	1	711	0.627	0.182	1.382	0.257	1.365
IIIa	Both	Q4	2	86	2.722	0.632	5.12	4.826	10.072
IIIa	Both	Q4	3	22	6.063	1.496	10.706	11.098	20.966
IIIa	Both	Q4	4	7	18.671	4.557	18.447	17.775	41.054
IIIa	Both	Q4	5	3	11.584	3.107	34.512	0	57.819
IIIa	Both	Q4	8	1	0	0	0	0	88.055

Table 6b Herring IIIa

SD	sex	Q	N	% Weight	% Length	% Sex	% Mat	% Age
IIIa	Both	Q1	1395	1.277	0.365	2.681	0.645	0.014
IIIa	Both	Q2	696	1.72	0.539	3.661	1.007	0.016
IIIa	Both	Q3	1170	1.325	0.354	2.955	1.991	0.02
IIIa	Both	Q4	833	1.194	0.315	2.272	1.164	0.02

Table 7a Sprat IIIa

SD	Sex	Q	AgeC	AntAge	CV_W %	CV_L %	CV_Sex %	CV_Mat %	CV_AC %
IIIa	Both	Q4	0	31	3.952	1.398	8.611	0	16.675
IIIa	Both	Q4	1	422	0.911	0.295	2.507	0.806	2.118
IIIa	Both	Q4	2	57	2.92	0.869	7.501	2.222	12.431
IIIa	Both	Q4	3	30	4.94	1.623	9.938	7.564	19.546
IIIa	Both	Q4	4	6	9.426	3.992	24.36	23.415	44.703
IIIa	Both	Q4	5	2	3.471	0	0	0	59.402
IIIa	Both	Q4	6	2	6.261	1.221	0	0	60.005

Table 7b Sprat IIIa

SD	Sex	Q	N	Weight %	Length %	Sex %	Mat %	Age %
IIIa	Both	Q4	550	1.628	0.53	3.987	1.498	0.028

Table 8a Cod in Kattegat

SD	Sex	Q	AgeC	AntAge	CV_W %	CV_L %	CV_Sex %	CV_Mat %	CV_AC
sd21	Both	Q1	2	113	3.566	1.04	NA	NA	7.185
sd21	Both	Q1	3	113	2.964	0.936	NA	NA	6.625
sd21	Both	Q1	4	27	6.01	2.069	NA	NA	19.867
sd21	Both	Q1	5	36	5.778	2.212	NA	NA	16.057
sd21	Both	Q1	6	3	31.938	11.47	NA	NA	56.676
sd21	Both	Q1	7	2	5.997	4.326	NA	NA	73.606
sd21	Both	Q2	2	119	3.923	1.05	NA	NA	9.312
sd21	Both	Q2	3	77	3.368	1.143	NA	NA	12.068
sd21	Both	Q2	4	43	4.461	1.585	NA	NA	14.778
sd21	Both	Q2	5	47	3.824	1.385	NA	NA	11.514
sd21	Both	Q2	6	15	6.264	2.405	NA	NA	24.346
sd21	Both	Q2	7	9	12.639	3.709	NA	NA	38.161
sd21	Both	Q2	8	3	32.738	11.665	NA	NA	49.453
sd21	Both	Q2	9	2	7.661	1.048	NA	NA	59.704
sd21	Both	Q3	2	169	3.16	1.057	NA	NA	4.857
sd21	Both	Q3	3	50	4.903	1.618	NA	NA	13.011
sd21	Both	Q3	4	20	11.03	3.846	NA	NA	19.43
sd21	Both	Q3	5	32	7.121	2.191	NA	NA	17.147
sd21	Both	Q3	6	3	12.915	5.108	NA	NA	56.277
sd21	Both	Q3	7	2	18.343	4.387	NA	NA	67.326
sd21	Both	Q4	1	16	4.308	1.65	NA	NA	23.079
sd21	Both	Q4	2	263	3.464	1.019	NA	NA	3.067
sd21	Both	Q4	3	40	4.892	1.553	NA	NA	15.933
sd21	Both	Q4	4	11	8.089	3.26	NA	NA	37.336
sd21	Both	Q4	5	9	8.654	3.211	NA	NA	30.818
sd21	Both	Q4	6	4	11.022	3.883	NA	NA	49.023

Table 8b Cod in Kattegat

SD	Sex	Q	N	Weight %	Length %	Sex %	Mat %	Age %
sd21	Both	Q1	294	4.134	1.366	NA	NA	0.024
sd21	Both	Q2	315	4.486	1.431	NA	NA	0.027
sd21	Both	Q3	276	4.671	1.543	NA	NA	0.026
sd21	Both	Q4	343	4.037	1.27	NA	NA	0.02

Table 9a Cod sd20

SD	Sex	Q	AgeC	N Age	CV_W %	CV_L %	CV_Sex %	CV_Mat %	CV_AC
sd20	Both	Q1	2	87	4.117	1.27	NA	NA	8.984
sd20	Both	Q1	3	102	3.068	1.012	NA	NA	6.316
sd20	Both	Q1	4	64	4.195	1.393	NA	NA	12.218
sd20	Both	Q1	5	45	4.365	1.361	NA	NA	10.439
sd20	Both	Q1	6	13	6.566	1.952	NA	NA	26.361
sd20	Both	Q1	7	5	9.907	3.142	NA	NA	37.876
sd20	Both	Q1	8	4	13.462	3.137	NA	NA	47.874
sd20	Both	Q1	9	2	6.199	2.088	NA	NA	78.925
sd20	Both	Q1	10	2	0.694	0.67	NA	NA	53.293
sd20	Both	Q1	11	2	13.335	5.101	NA	NA	59.198
sd20	Both	Q1	12	1	0	0	NA	NA	84.019
sd20	Both	Q2	2	111	4.335	1.39	NA	NA	6.785
sd20	Both	Q2	3	94	3.17	0.972	NA	NA	6.565
sd20	Both	Q2	4	50	5.514	1.957	NA	NA	10.724
sd20	Both	Q2	5	28	7.388	2.618	NA	NA	16.66
sd20	Both	Q2	6	12	9.761	2.445	NA	NA	26.1
sd20	Both	Q2	7	11	7.516	2.405	NA	NA	29.123
sd20	Both	Q2	8	9	4.551	1.445	NA	NA	31.495
sd20	Both	Q2	9	10	8.142	2.619	NA	NA	29.607
sd20	Both	Q2	10	3	0.586	1.077	NA	NA	47.255
sd20	Both	Q2	12	3	4.459	1.839	NA	NA	49.82
sd20	Both	Q2	15	1	0	0	NA	NA	64.433
sd20	Both	Q3	1	4	17.119	4.797	NA	NA	43.354
sd20	Both	Q3	2	129	3.763	1.27	NA	NA	7.838
sd20	Both	Q3	3	58	4.511	1.646	NA	NA	13.9
sd20	Both	Q3	4	49	3.871	1.378	NA	NA	12.364
sd20	Both	Q3	5	34	3.766	1.12	NA	NA	11.784
sd20	Both	Q3	6	13	7.467	2.244	NA	NA	37.495
sd20	Both	Q3	7	12	5.961	1.942	NA	NA	28.499
sd20	Both	Q3	8	7	7.028	2.663	NA	NA	41.182
sd20	Both	Q3	9	2	16.06	7.309	NA	NA	60.698
sd20	Both	Q3	10	1	0	0	NA	NA	87.1
sd20	Both	Q3	11	2	7.646	1.292	NA	NA	61.498
sd20	Both	Q3	12	1	0	0	NA	NA	80.23
sd20	Both	Q4	1	28	4.083	1.343	NA	NA	18.706
sd20	Both	Q4	2	254	2.501	0.786	NA	NA	3.491
sd20	Both	Q4	3	59	3.365	1.116	NA	NA	12.944
sd20	Both	Q4	4	60	3.362	1.025	NA	NA	14.332
sd20	Both	Q4	5	40	3.159	1.217	NA	NA	17.927
sd20	Both	Q4	6	26	2.883	0.948	NA	NA	16.347
sd20	Both	Q4	7	16	4.382	1.652	NA	NA	26.564
sd20	Both	Q4	8	5	22.25	7.324	NA	NA	42.494
sd20	Both	Q4	9	6	6.127	1.667	NA	NA	39.715
sd20	Both	Q4	11	3	5.855	1.365	NA	NA	57.773

Table 9b Cod sd 20

SD	Sex	Q	N	Weight %	Length %	Sex %	Mat %	Age
sd20	Both	Q1	327	4.18	1.328	NA	NA	0.025
sd20	Both	Q2	332	4.83	1.571	NA	NA	0.028
sd20	Both	Q3	312	4.505	1.518	NA	NA	0.033
sd20	Both	Q4	497	3.204	1.039	NA	NA	0.021

Table 10. BITS q1 survey 2010

Species	SD	Q	Gear	Sex		AgeC	nAge	CV_W %	CV_L %	CV_Sex %	CV_Mat %	CV_AC
cod_bitsq1	25	1	OTB	Both		1	75	36.7	10.327	14.397	0	34.285
cod_bitsq1	25	1	OTB	Both		2	355	2.012	0.652	1.077	1.533	4.054
cod_bitsq1	25	1	OTB	Both		3	291	1.827	0.441	1.552	1.911	4.056
cod_bitsq1	25	1	OTB	Both		4	178	9.329	2.194	6.088	1.958	6.012
cod_bitsq1	25	1	OTB	Both		5	93	11.977	3.89	15.411	0	23.72
cod_bitsq1	25	1	OTB	Both		6	50	15.405	3.873	17.792	0	35.136
cod_bitsq1	25	1	OTB	Both		7	19	56.277	15.372	21.002	0	88.388
cod_bitsq1	25	1	OTB	Both		8	4	NA	NA	NA	NA	NA

Table 11 BIAS q4 survey 2010

Species	SD	Q	Gear	Sex	AgeC	nAge	CV_W %	CV_L %	CV_Sex %	CV_Mat %	CV_AC %
HER_BIAS	IIIb-d	4	Fotö	Both	0	350	3.375	1.464	1.693	0	9.594
HER_BIAS	IIIb-d	4	Fotö	Both	1	573	1.849	0.597	1.263	0.31	4.604
HER_BIAS	IIIb-d	4	Fotö	Both	2	665	0.546	0.166	0.909	1.409	3.683
HER_BIAS	IIIb-d	4	Fotö	Both	3	756	0.959	0.263	1.491	1.315	3.029
HER_BIAS	IIIb-d	4	Fotö	Both	4	455	0.925	0.28	1.395	1.9	3.432
HER_BIAS	IIIb-d	4	Fotö	Both	5	295	1.015	0.322	2.62	1.362	4.339
HER_BIAS	IIIb-d	4	Fotö	Both	6	183	2.172	0.654	4.81	3.934	6.2
HER_BIAS	IIIb-d	4	Fotö	Both	7	186	2.572	0.839	3.737	2.178	11.776
HER_BIAS	IIIb-d	4	Fotö	Both	8	221	1.49	0.541	3.407	2.888	4.89
HER_BIAS	IIIb-d	4	Fotö	Both	9	60	4.826	1.466	5.875	3.926	22.226
HER_BIAS	IIIb-d	4	Fotö	Both	10	55	2.787	1.058	11.197	5.15	10.925
HER_BIAS	IIIb-d	4	Fotö	Both	11	41	4.818	1.485	8.411	9.361	21.794
HER_BIAS	IIIb-d	4	Fotö	Both	12	33	5.723	1.559	11.962	9.028	26.196
HER_BIAS	IIIb-d	4	Fotö	Both	13	31	8.51	2.688	12.669	17.646	29.57
HER_BIAS	IIIb-d	4	Fotö	Both	14	21	6.334	1.475	17.998	7.612	42.859
HER_BIAS	IIIb-d	4	Fotö	Both	15	11	14.903	4.235	30.282	0	59.17
HER_BIAS	IIIb-d	4	Fotö	Both	16	17	13.689	2.924	28.044	0	43.619
HER_BIAS	IIIb-d	4	Fotö	Both	17	5	14.493	3.255	21.355	0	73.771
HER_BIAS	IIIb-d	4	Fotö	Both	18	5	23.601	5.655	35.355	0	68.465
HER_BIAS	IIIb-d	4	Fotö	Both	19	4	18.993	6.817	24.398	0	71.527
HER_BIAS	IIIb-d	4	Fotö	Both	20	5	42.106	10.311	NA	42.164	35.136
SPR_BIAS	IIIb-d	4	Fotö	Both	0	263	1.353	0.43	3.399	NA	5.575
SPR_BIAS	IIIb-d	4	Fotö	Both	1	176	0.759	0.242	2.877	NA	4.967
SPR_BIAS	IIIb-d	4	Fotö	Both	2	532	0.553	0.192	1.873	NA	2.507
SPR_BIAS	IIIb-d	4	Fotö	Both	3	145	1.489	0.518	4.644	NA	8.12
SPR_BIAS	IIIb-d	4	Fotö	Both	4	157	1.911	0.695	5.525	NA	10.715
SPR_BIAS	IIIb-d	4	Fotö	Both	5	38	4.24	1.55	11.257	NA	23.008
SPR_BIAS	IIIb-d	4	Fotö	Both	6	83	2.11	0.808	8.046	NA	15.377
SPR_BIAS	IIIb-d	4	Fotö	Both	7	153	2.089	0.885	5.801	NA	10.277
SPR_BIAS	IIIb-d	4	Fotö	Both	8	118	2.45	0.934	6.675	NA	13.72
SPR_BIAS	IIIb-d	4	Fotö	Both	9	13	9.14	2.834	29.664	NA	54.234
SPR_BIAS	IIIb-d	4	Fotö	Both	10	33	8.146	3.086	17.751	NA	38.457
SPR_BIAS	IIIb-d	4	Fotö	Both	11	8	6.828	3.532	42.891	NA	96.429
SPR_BIAS	IIIb-d	4	Fotö	Both	12	10	6.399	2.701	36.814	NA	66.239
SPR_BIAS	IIIb-d	4	Fotö	Both	13	14	9.805	3.964	32.672	NA	46.601
SPR_BIAS	IIIb-d	4	Fotö	Both	14	12	9.285	3.879	34.918	NA	60.983
SPR_BIAS	IIIb-d	4	Fotö	Both	15	13	8.138	3.09	35.318	NA	57.382
SPR_BIAS	IIIb-d	4	Fotö	Both	16	4	7.131	1.681	0	NA	128.19

Table 12. IBTS q1 survey 2010

Species	SD	Q	Gear	Sex	AgeC	nAge	CV_W %	CV_L %	CV_Sex %	CV_Mat %	CV_AC
COD_IBTS	sd20	1	OTB	Both	1	117	10.328	3.707	7.588	0	16.701
COD_IBTS	sd20	1	OTB	Both	2	143	7.123	2.275	7.382	3.43	14.087
COD_IBTS	sd20	1	OTB	Both	3	13	18.247	6.124	31.253	20.733	53.784
COD_IBTS	sd20	1	OTB	Both	4	16	4.194	2.015	19.671	0	36.51
COD_IBTS	sd20	1	OTB	Both	5	7	17.196	7.345	37.485	18.952	64.454
COD_IBTS	sd20	1	OTB	Both	6	4	0.272	0.124	0.292	0	4.33
COD_IBTS	sd20	1	OTB	Both	10	1	0	0	0	0	161.374
COD_IBTS	sd21	1	OTB	Both	1	68	6.848	2.198	5.463	0	8.831
COD_IBTS	sd21	1	OTB	Both	2	119	6.364	1.794	4.482	4.933	5.731
COD_IBTS	sd21	1	OTB	Both	3	4	19.666	6.885	33.183	0	68.872
COD_IBTS	sd21	1	OTB	Both	4	2	18.028	4.964	0	0	78.379
COD_IBTS	sd21	1	OTB	Both	5	7	30.566	11.721	35.049	0	55.757
COD_IBTS	sd21	1	OTB	Both	6	2	7.679	0	45.76	0	76.935
COD_IBTS	sd21	1	OTB	Both	7	1	0	0	0	0	89.816
COD_IBTS	sd23	1	OTB	Both	1	13	21.226	8.918			52.725
COD_IBTS	sd23	1	OTB	Both	2	140	3.517	1.197	3.138	3.208	3.95
COD_IBTS	sd23	1	OTB	Both	3	34	7.203	1.994	10.102	4.775	20.235
COD_IBTS	sd23	1	OTB	Both	4	32	7.153	2.558	10.737	0	22.695
COD_IBTS	sd23	1	OTB	Both	5	66	8.397	2.473	8.005	0	16.222
COD_IBTS	sd23	1	OTB	Both	6	23	15.507	5.117	15.651	0	29.56
COD_IBTS	sd23	1	OTB	Both	7	6	23.711	8.955	38.339	0	58.698
COD_IBTS	sd23	1	OTB	Both	8	3	34.864	11.362	0	0	77.53
COD_IBTS	sd23	1	OTB	Both	9	2	13.114	3.703	0	0	84.234
PLE_IBTSq1	IIIa	1	OTB	Both	1	1	0	0	0	0	144.338
PLE_IBTSq1	IIIa	1	OTB	Both	2	77	7.691	2.513	4.086	5.491	8.291
PLE_IBTSq1	IIIa	1	OTB	Both	3	228	3.637	1.191	2.737	2.822	6.383
PLE_IBTSq1	IIIa	1	OTB	Both	4	234	3.845	1.157	5.075	3.152	6.153
PLE_IBTSq1	IIIa	1	OTB	Both	5	126	5.138	1.844	4.914	4.967	7.588
PLE_IBTSq1	IIIa	1	OTB	Both	6	30	8.174	2.845	6.729	7.931	17.5
PLE_IBTSq1	IIIa	1	OTB	Both	7	10	27.386	7.117	27.722	16.001	34.505
PLE_IBTSq1	IIIa	1	OTB	Both	8	7	32.07	8.297	25.128	17.569	32.98
PLE_IBTSq1	IIIa	1	OTB	Both	9	4	14.563	4.886	0	0	71.429
PLE_IBTSq1	IIIa	1	OTB	Both	10	15	17.715	4.784	10.546	0	19.795
PLE_IBTSq1	IIIa	1	OTB	Both	11	9	23.098	3.967	11.668	0	35.377
PLE_IBTSq1	IIIa	1	OTB	Both	12	11	22.324	8.779	9.642	0	32.612
PLE_IBTSq1	IIIa	1	OTB	Both	13	2	28.062	11.005	53.452	0	47.246
HAD_IBTSq1	IIIa	1	OTB	Both	1	165	2.136	0.741	3.232	2.677	1.113
HAD_IBTSq1	IIIa	1	OTB	Both	2	44	6.691	2.118	18.374	18.835	22.706
HAD_IBTSq1	IIIa	1	OTB	Both	3	46	16.926	5.611	16.576	13.542	20.345
HAD_IBTSq1	IIIa	1	OTB	Both	4	13	34.641	11.394	8.839	8.839	75.066
HAD_IBTSq1	IIIa	1	OTB	Both	5	17	13.929	4.966	42.441	0	53.741
WIT_IBTS	IIIa	1	OTB	Both	1	11	10.252	3.283			28.533
WIT_IBTS	IIIa	1	OTB	Both	2	30	7.763	1.953	10.366	0	17.651
WIT_IBTS	IIIa	1	OTB	Both	3	43	4.78	1.41	8.61	5.44	11.092
WIT_IBTS	IIIa	1	OTB	Both	4	6	12.668	4.291	21.318	22.452	40.771
WIT_IBTS	IIIa	1	OTB	Both	5	2	5.553	2.372	35.348	35.348	71.442
WIT_IBTS	IIIa	1	OTB	Both	6	4	14.541	4.556	27.169	29.458	51.689
WIT_IBTS	IIIa	1	OTB	Both	7	3	13.106	3.677	0	31.348	49.13
WIT_IBTS	IIIa	1	OTB	Both	8	3	26.254	10.886	38.105	0	55.999
WIT_IBTS	IIIa	1	OTB	Both	9	1	0	0	0	0	84.965
her_IBTSq1	IIIa	1	OTB	Both	1	677	0.574	0.206	1.001	0	1.368

her_IBTSq1	IIIa	1	OTB	Both	2	393	2.846	0.73	5.511	1.968	6.702
her_IBTSq1	IIIa	1	OTB	Both	3	160	5.682	1.668	6.953	3.225	13.105
her_IBTSq1	IIIa	1	OTB	Both	4	90	4.534	0.988	11.996	1.68	26.579
her_IBTSq1	IIIa	1	OTB	Both	5	29	4.97	1.228	20.759	0	40.156
her_IBTSq1	IIIa	1	OTB	Both	6	17	28.949	11.341	40.825	0	48.428
her_IBTSq1	IIIa	1	OTB	Both	7	11	17.014	4.241	41.833	0	49.69
her_IBTSq1	IIIa	1	OTB	Both	8	6	22.699	4.049	0	0	81.65
her_IBTSq1	IIIa	1	OTB	Both	9	3	0	0	0	0	0
her_IBTSq1	IIIa	1	OTB	Both	10	2	14.539	3.449	0	0	0
spr_IBTSq1	IIIa	1	OTB	Both	1	241	3.175	0.981	4.382	3.622	9.25
spr_IBTSq1	IIIa	1	OTB	Both	2	135	1.216	0.303	5.619	0.348	5.586
spr_IBTSq1	IIIa	1	OTB	Both	3	32	1.502	0.444	5.325	1.835	12.882
spr_IBTSq1	IIIa	1	OTB	Both	4	104	0.79	0.227	3.157	0	6.48
spr_IBTSq1	IIIa	1	OTB	Both	5	24	3.85	1.525	7.34	0	12.096
spr_IBTSq1	IIIa	1	OTB	Both	6	37	1.844	0.778	4.308	0	14.277
spr_IBTSq1	IIIa	1	OTB	Both	7	6	3.164	1.524	23.719	0	29.346