ADDENDUM 2 to WGBIFS Report 2006

Report of the WGBIFS Workshop on BITS Data Quality Assurance

30 January to 3 February 2006

Gdynia, Poland

International Council for the Exploration of the Sea
Conseil International pour l'Exploration de la Mer

Contents

Executive summary

The Workshop was planned and conducted to evaluate and improve the quality of the Baltic International Fish Survey (BIFS) data stored in the DATRAS database managed by ICES. Missing haul information and incorrect use of the haul validity code had been identified and the catch data (CA) were incomplete and subjected to error. Cod biological parameters given in the CA records was found to include a substantial amount of outlying data points, which were not detected by the DATSU screening program that is used when uploading basic data to the database system. Furthermore, the cod weight at length information in the CA records for the period prior to 2004 has in some cases been registered as individual fish data and in others as aggregated data. The aggregated data cause problems for statistical analyses of data and modelling of growth.

At the WGBIFS meeting in 2005, a revision of the national data and resubmission to the database was decided, and the present workshop was planned to follow up the progress. Highest priority was given to the revision of haul information (HH) and biological parameters on cod (CA) from the Baltic International Trawl Surveys (BITS) in Subdivisions 22–29 for the period 1991–2005. In order to further improve the data quality, an additional screening procedure has been developed and used to check weight-length data before uploading to DATRAS. This includes identification of outliers in the length-weight relationship of cod and suggestions to use size limits for maturity stages to check the data validity. During the workshop each country presented their progress regarding the revision of national data. All countries had made substantial efforts to revise data. In most cases, the work is still ongoing as e.g. the extraction and resubmission of the cod biological data on individual level to obtain the single fish weight can be time consuming. The revision of data from the above mentioned surveys and period is expected finalized in September 2006.

An overview over existing data in DATRAS was elaborated during the meeting. Different tables were produced so that scientists working in different national laboratories can avail themselves with the information and check whether e.g. all hauls or biological parameters are included in the database. As the revised data have not been resubmitted yet, the DATRAS overview largely represents the starting point of the revision. All countries were found to use the species recording code correctly. However, not all species are reported as recommended in the BITS manual, some surveys were not included and specific hauls were lacking for some surveys. An overview over CA data including available maturity and age records was made, while the cod weight at length data were deleted from the database for surveys with average weight data. The CA data for these surveys will be resubmitted to reflect individual cod weight at length. In addition, an overview over existing national survey data was made by the participants for each country. These tables compared the data available in DATRAS showed that substantial information exists that could be used to extend data coverage in time, space and number of species (CA). The focus of the present workshop was cod data, but a similar revision of other species in the database is recommended to optimize the data quality and coverage.

Data evaluation and initial analysis cod maturity and weight data was planned to overview the data available for establishing maturity ogives and weight at age in the stock (WEST). The Baltic Fisheries Assessment Working Group (WGBFAS) has urged the need for updated time series as for use in the assessment of Baltic cod stocks as the data series have not been updated since 1997. An analysis of weight data awaits resubmission at individual level as a large number of records in the CA database will be replaced. Initial analyses of the national maturity data for cod showed some inconsistency in the staging. Maturity data are reported to ICES using the 5 level maturity scale described in the BITS manual, but the data are generally converted from national scale used during sampling. However, the conversion can not be made in a consistent way due to the nature of the national scales, which makes is impossible to

establish maturity ogives in the traditional sense as not all scales separate immature and adult, but group immature and adults in resting condition. However, it will be possible to estimate the proportion that will spawn based on ripening and spawning specimens. The maturity and weight data will be analysed as soon as the revision cod CA data is finalised. Final analyses will be conducted in relation to the ongoing EU-projects BECAUSE and UNCOVER.

Maturity and weight at age of herring and sprat are used by the WGBFAS in the annual assessment and data have been revised some years ago. A review of maturity and weight data of herring and sprat in the Eastern Baltic was provided showing substantial changes in maturation and growth over time. The overview tables showed that substantial information exist for herring and sprat on a national level, however not all surveys are suited for estimation of maturity. Finally, an overview over existing national survey and commercial data on flounder was explored. The information shows that substantial data exist on flounder in different areas of the Baltic. At present, only flounder in Subdivision 24–25 is assessed, but the potential likely exist to provide survey based biological information for additional areas, if assessment should be extended. Available information for other flatfish species was too limited in DATRAS at present to provide material for an analysis.

1 Opening of the meeting

The Workshop on BIFS Data Quality Assurance was opened by the Co-Chairs: Jonna Tomkiewicz (Denmark) and Rainer Oeberst (Germany), and Wlodzimierz Grygiel (Poland) who kindly hosted the meeting at the Sea Fisheries Institute in Gdynia. The Workshop was attended by 16 scientists and research assistants representing all countries presently conducting the Baltic International Trawl Surveys (BITS), i.e. Denmark, Estonia, Germany, Latvia, Lithuania, Poland, Russia and Sweden as well as ICES (Annex 1). The participants partly were members of the ICES Working Group Baltic International Fish Surveys (WGBIFS) and partly scientists from national fisheries institutes collecting or working with BIFS data.

2 Adoption of the agenda

The agenda of the workshop was presented and adopted by the participants. The agenda is provided as Annex 2. In addition a working paper was provided: Grygiel, Radtke and Nermer (SFI, Poland): “The southern Baltic cod, clupeids and flounder sexual maturation”, and a presentation was integrated in the program.

3 Objectives

During the 2005 WGBIFS meeting a need for quality assurance of the BIFS data maintained by ICES in the DATRAS database was identified. The WG suggested a revision of national datasets and an informal workshop to follow up this work. The workshop should include representatives from the institutes participating in the Kattegat, Western and Eastern Baltic surveys to provide a forum for evaluation of the quality of existing data to estimate stock abundance, maturity ogives and weight-at-age. The workshop should provide status of the national revision and identify further needs to optimise the DATRAS database. The ICES Working Group on Baltic Fisheries Assessment (WGBFAS) has for several years pointed at the need for improved maturity and weight data for the assessment of Kattegat and Baltic cod stocks. Preliminary analyses should be performed to evaluate the potential for updating these time series. The suggested workshop was approved by ICES in September 2005. The Terms of Reference are given in Annex 3.

4 Introduction

Fisheries independent estimates of stock abundance, distribution and parameters like weight at age or maturity ogives are required for stock assessment and management. Trawl and acoustic surveys in the Baltic Sea, which are coordinated by the WGBIFS, provide the data basis for the fisheries independent data.

WGBIFS is responsible for the planning of the Baltic international surveys, the elaboration of guidelines for data collection and for ensuring the quality of the data. The working group considers and implements necessary changes and improvements of the survey design and data analyses. All used methods are described in the WGBIFS manual, which is regularly updated, and further information can be found in the reports of the working group. The data of the trawl surveys are stored in the DATRAS database, which is hosted and managed by ICES. Procedures for screening the data are integrated in the DATRAS system. These procedures check whether the data are within predefined ranges and cross checks are made by comparing incoming data with similar data made from existing source data. However, different studies show that despite the current screening procedures, different kinds of errors or unreliable data still occur in the database. Also different shortcomings in the classification of data and missing data have been identified.

A validity code classifies the haul data and information (HH) stored in the databases in order to distinguish trawl hauls suitable for estimation of stock abundance from invalid hauls or hauls with alternative purposes. The validity code thus allows storing information about hauls that can not be used for the stock assessment, but are needed for e.g. analyses of inter-calibration hauls. In the analysis, these hauls are used to estimate conversion factors between the new standard gears and the former used national gears. The validity code ‘V’ is used for hauls that can be applied for the stock abundance estimation; ‘C’ identifies calibration hauls, while ‘I’ are hauls rendered invalid due to e.g. damage of he gear. All other hauls have the code ‘C’. In addition, the code ‘N’ identifies hauls with assumed 0-catch due to very low oxygen contents in the bottom water. These assumed 0-catches have in recent years been ascertained by acoustic tracks. Analyses of the database have, however, shown that the codes were not consistently used through out the database and some hauls were missing. The need for revision of the hauls information was discussed during the WGBIFS meeting in 2005.

Furthermore, data on individual fish stored as CA (age, length, sex, maturity, weight) records are subjected to different types of error. An example is that about 65% of all cod, caught by one country during a spring survey showed age zero. Such values are obviously wrong, as the surveys are conducted in February-March and spawning of cod in the Baltic Sea start at earliest in February in the more western located area and later in the Eastern Baltic. The error is likely due to that age of the fish is not determined. Outliers appear e.g. in the relation between length and weight of the cod stored in the CA records. Figure 4.1 shows the residuals of the weight-length regression which is based on multiplicative model. The data which are marked by red circle are outside the expected range. Checks of the database also have shown that some data routinely sampled during surveys, are not included in the database, e.g. weight were missing in CA data from one country.

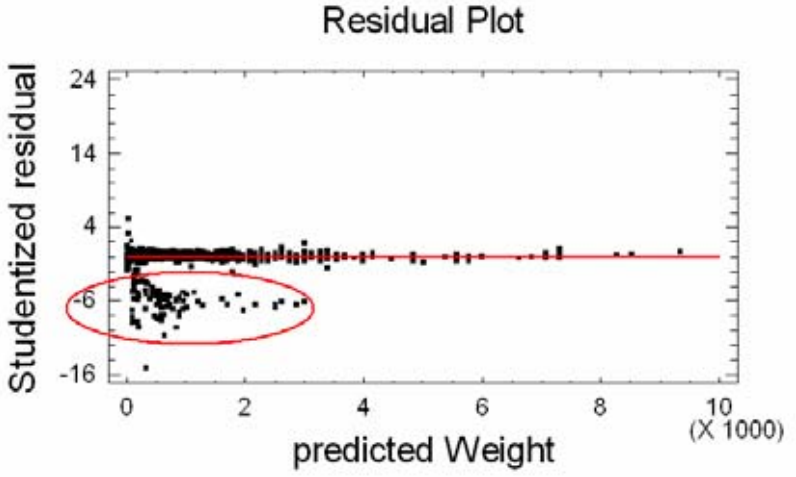

Figure 4.1: Residual plot of length weight relation of one country when $W=aL^b$ regression was used.

These preliminary analyses demonstrated that a fast and concerted action to revise the database was necessary, and the initiative to establish a sub-group to evaluate and improve the quality of data stored in the BITS/DATRAS database was taken during the WGBIFS meeting in 2005. The group should work by correspondence and meet for exchange of information and analyses of data during a WGBIFS workshop in January in order to provide improved data for WGBIFS meeting in 2006 to be used by the assessment working group in April 2006.

During autumn 2005, all countries have worked with revision of their national databases. The haul information has been checked with special attention to the validity code. Since the screening procedures integrated in the DATRAS database do catch some of the CA specific problems at present, an additional screening programme (DA_CA_Check.xls) elaborated by Rainer Oeberst was made available for all counties in autumn 2005.

Also the length distributions (HL) have been checked where problems were identified. The progress made on national databases and the status of BIFS data in DATRAS was presented at the workshop.

5 Status of BIFS data

Description of the status of national databases and data checks performed prior to the workshop in relation to HH: haul information, HL: length frequency distributions and CA: data on individual fish sampled in the catches, as well as intended further work to optimise the data quality.

5.1 Danish data

Denmark has carried out surveys since 1982. Cod CA data exist since 1995. The data uploaded in DATRES at present suffer from a number of deficiencies:

- Individual cod weight and age information are missing in some years due to submission of only preliminary data for 1 quarter.
- A number of calibration hauls, C, has not been submitted to DATRAS.
- A number of hauls for which zero-catch of cod, N, has been assumed due to low oxygen contents have not been submitted.
- Some gear information is missing.

- Some flatfish species has been reported in as measured in cm although they actually were measured in semi-cm.
- Some inaccuracy is detected in the depth information submitted.

In order to prevent such mistakes in the future the following actions have been taken

- New extraction program has been developed.
- Data are checked more consistently in the national database. Haul validity will be checked for all hauls.
- New procedures for submitting data to DATRAS has been adopted.
- All data back in time will be resubmitted to DATRAS.

The correction of HH data for the period 2000–2005 should be finalised before WGBFAS. Data check for previous years is ongoing and data from previous years will be uploaded to DATRAS before September 2006. Cod CA data have also being corrected and will similarly be resubmitted to DATRAS.

5.2 Estonian data

Estonian participation in the regular BITS surveys commenced in autumn 2005. The data from the first survey are in the checking process and will be uploaded to DATRAS in March 2006.

5.3 German data

Germany has carried out trawl surveys in spring and autumn since 1981. HH, HL and CA data from these surveys are available in the DATRAS database. In autumn 2005, the existing cod dataset were checked to identify unreliable data in the weight-length relation, unexpected large sizes (length) of immature cod (maturity stage 1) and unexpected data in the age-length relationship. The first and second type of data checks were made using screening tool where data were automatically marked when beyond the critical level. The tools were based on proposed algorithms or thresholds for outliers. The relation between age and length were visually checked using x-y plots of the data.

The identified potential outliers were compared with the raw data written in the protocols. Data were corrected where necessary. All CA data of checked surveys were resubmitted to ICES data centre in December 2005.

5.4 Latvian data

All Latvian HH, HL and cod CA data existing in the DATRAS database have been checked. Mistakes were corrected. Data for specimens that possessed unreliable information about fish age were deleted. Corrected CA data for cod and flounder were prepared in the new DATRAS format. Data until 2004 were prepared in summarized format. For the years from 2004 until now, all information is prepared on individual fish basis. The checked data have been sent to ICES in January and will be uploaded in the DATRAS database.

5.5 Lithuanian data

Lithuania is participating in BITS from autumn 2004. Data from 2004 quarter 4 and 2005 quarter 1 and 4 for all species have been submitted to DATRAS. All available HH, HL and Ca data have been checked and resubmitted.

5.6 Polish data

Overall, 27 BITS surveys conducted during the period 1990–2005 (mostly in February-March and November) by Polish research vessels are documented in the BIFS/DATRAS database. Data from in total 1226 bottom trawl catches are reported in the HH records. The HL records

concerning herring, sprat, cod and flounder originate from 13, 13, 27 and 22 surveys, respectively, are documented in the database. The same number of the CA records as above per species exists. All types of CA data have routinely been recorded for cod and flounder, but not herring and sprat.

Recently, data from a total of 23 the Polish BITS surveys carried out in the period of 1991–2005 were checked. Data were examined again by comparing with the originals stored in handwritten survey protocols (haul information, length distributions and ichthyological analyses) with the records stored in the BITS/DATRAS database. Unreliable CA data were detected by applying the checking programme (DA_CA_Check.xls).

In the process of the Polish data verification, the database was supplemented with 41 new HH records. These were previously omitted due to lacking catch of species recorded in the Polish BITS/DATRAS database (zero catch hauls). However, hauls not realized due to low oxygen content in the water bottom layers (assigned for realization by WGBIFS) were not included in the current database reworking at present, since it needs further clarification with assist of the cruise leaders. In addition, it is not clear how to fill fields in the DATRAS database for these types of hauls.

After checking the haul validity in the HH records, the status of seven records was changed from valid to invalid and for two records the status was changed from calibrated to invalid. It is not clear, however, how to indicate invalid information for the HL records in BITS database. In a field "haul validity" there were four changes from valid to calibrate. The strategy of marking hauls with valid or calibrated in the inter-calibration experiments needs further clarification.

Verification of the HL records resulted in the addition of in total 105 HL records with zero cod catch. It is not clear how the HL fields in the DATRAS database with species of zero catch should be filled in.

CA datasets were examined only for cod from February 2001–2005 surveys. Outliners from the length-mass relationship were the most frequently indicated errors (usually from a few to 30 cases). These errors, however, mainly referred to the smallest cod (from 10 cm to 25 cm) which were weighed on the scale using 5 grams accuracy intervals, which caused errors (one individual of the same length could weigh 10 g and another one 15 g). Other errors were due to punching errors, and these were recently corrected and updated in the database. Punching errors referred to mass, age (a few cases only) and in one case to length of the fish.

CA errors examining will be continued after the ICES workshop for the rest of the species recorded and the remaining surveys. However, it should be emphasized that the CA records for the surveys before 2000 do not contain individual fish mass.

5.7 Russian data

Russia has carried out trawl surveys in spring since 1993. Biological materials of demersal trawl surveys of 1993–2005 have been transmitted ICES and are available in the DATRAS database. However, no surveys were conducted in 1993–1994 and thus no Russian data are available in the database for these years.

The following quality checks have been performed with Russian HH and with cod and flounder CA-records from quarter 1 surveys during the years 1995–2005 and from quarter 4 surveys during the years 2001–2004. Quality check of the data submitted to the DATRAS database has been carried out using the DATRAS checking program and with the help of the additional CA screening program (DA_CA_Check.xls). Data examining and check of mistakes will continue after the ICES workshop for the rest of the species recorded and the remaining surveys.

5.8 Swedish data

The following quality checks have been performed with Swedish HH and CA-records from quarter 1 and 4 surveys during the years 1991–2005.

Length-weight and length-age relations for cod (no CA-records for others species exists) were plotted and outliers have been corrected. Some problems with maturity stages were detected, in particular the usage of different maturity scales in the past. Presently, the maturity stages have been converted to the 5-grade scale described in the BITS manual before submission to DATRAS. The IBTS 4-grade scale which has been used for some surveys in earlier time could not be converted to the BITS-scale. During surveys using the IBTS 4-grade scale BITS maturity stage 5 is included in IBTS stage 2 or 4.

Regarding HH, the validity codes of haul records have been checked and corrected. All BITS-data 1991-2005 quarter 1 and 4 were screened and errors corrected before resubmission and uploading to the DATRAS system.

6 Status of the data in the DATRAS database

The DATRAS database presently includes data from 1991 to present. Data from Sweden and Germany have been resubmitted to ICES previous to the workshop and the data have been screened with the DATSU program and loaded to the DATRAS database. Data from more countries will be resubmitted in near future and ICES will make sure that they are included into DATRAS immediately after receiving the data.

To provide an overview of the data in the database a number of extractions from DATRAS were made at the workshop:

1. Number of species according to species reporting codes (Table 6.1).

   Results:

   a. All countries use the species recording codes correct.
   b. Most countries report all species, however, in some years a few countries only delivered cod, or cod and flounder.
   c. Poland only provides data for standard species and for some surveys only cod.

2. Number of hauls per ship per quarter and year (Table 6.2)

   Results:

   a. 4th quarter data are missing from Russia.

3. Number of maturity records (Annex 4).

   Results:

   a. Maturity of cod is determined by all countries and data are submitted to DATRAS on a regular basis
   b. Maturity data on herring and sprat have been provided for some years by Germany, Russia, Poland and in 2005 by Lithuania
   c. Maturity data on flounder are provided by all countries except Sweden and Denmark
   d. Maturity on other flatfish have been provided for some years by Germany and for a few years by Russia
   e. Large numbers of CA records are missing maturity information. This will improve when all countries have resubmitted data, however, the maturity have not been determined for a number of fish and will therefore never be in the database.

4. Number of age records (Annex 5).

Results:

a. Age data on cod is collected and provided to DATRAS on a regular basic for all countries.
b. Age data on flounder are provided from all other countries than Sweden and Denmark.
c. Age data on herring and sprat have been provided in some years from Germany, Russia, and Poland and from 2005 from Lithuanian.
d. Age on other flatfish has been provided for some years from Germany and in a few years from other countries as well.
e. Large numbers of SMALK records are missing age information. This will change when all countries have resubmitted data, however, the age have not been identified in a number of fish and will therefore never be in the database.

The data on individual weight of cod represents a special problem. The CA data in DATRAS are not necessarily recorded as single specimens and in the manual, the reporting of weight data as individual data or as average by length, age, sex and maturity has been optional. In addition, the DATRAS database combines identical records. Consequently, the data on cod weight in DATRAS are stored as a mixture of average and individual weights by category (length, age, sex and maturity) and it is not possible to separate the types of combined data. The problem primarily relates to data from the period before 2004, when the DATRAS database and reporting system was set up.

This problem made it necessary to delete the weight data for cod stored in DATRAS and to resubmit cod CA data on individual level. This has been agreed by all countries and this revision of the CA data is ongoing and expected to be accomplished in August/September 2006. This revision of cod weight is crucial for updating weight at length and age for the use by the WGBFAS. Data on cod weight at age and maturity ogives has not been updated since 1997.

Table 6.1: Species reporting code by country.

Country	Standard reporting code	Bycatch reporting code
DEN	1	1
GFR	1 3 3	1 1 0
LAT	1	1
LTU	1	0
POL	1 4 3	0 0 0
RUS	1 3 4	1 1 1
SWE	1	1
EST	1 4	1 0

Table 6.2: Number of hauls per ship.

Quarter	Year	Ship	Number of hauls
1	1991	ARG	36
		DAN2	69
		GDY	66
		SOL	125
		ZBA	62
	1992	ARG	39
		CLP	21
		DAN2	64
		GDY	16
		SOL	95
	1993	ARG	43
		BPE	25
		CLP	21
		DAN2	71
		GDY	50
		SOL	61
	1994	ARG	43
		BAL	68
		CLP	10
		DAN2	69
		SOL	83
	1995	ARG	46
		BAL	47
		CLP	11
		DAN2	68
		MON	44
		MONL	23
		SOL	63
	1996	ARG	50
		BAL	64
		DAN2	55
		MON	57
		MONL	28
		SOL	63
	1997	ARG	45
		ATL	41
		BAL	133
		CLP	10
		DAN2	50
		SOL	28
	1998	ARG	44
		ATLD	43
		BAL	119
		CLP	11
		DAN2	64
		SOL	63
	1999	ARG	44
		ATL	40
		BAL	62
		CLV	18
		DAN2	68
		SOL	70
	2000	ARG	49
		ATL	37
		BAL	52
		CLV	24
		DAN2	57
		HAF	46
		SOL	52
	2001	ARG	42
		ATL	52
		BAL	68
		CLV	28
		DAN2	55
		HAF	45
		SOL	66
	2002	ARG	39
		BAL	23
		CLV	21
		DAN2	37
		HAF	41
		SOL	60
		VSH	44
	2003	ARG	39
		ATL	50
		BAL	30
		CLV	25
		DAN2	45
		SOL	58
	2004	ARG	39
		ATL	48
		BAL	34
		CLV	30
		DAN2	39
		SOL	59
	2005	ARG	39
		ATL	54
		BAL	40
		CLV	33
		DAN2	35
		DAR	4
		SOL	54
2	1991	ZBA	1
	1993	BPE	11
		MON	27
	1994	MON	33
		MONL	45
	1995	KOH	22
	1996	BAL	19
		CLP	8

Quarter	Year	Ship	Number of hauls
		KOH	11
	1997	ATL	4
		CLV	15
2	1998	ATLD	7
		CLV	16
	1999	CLV	12
	2000	KOOT	13
3	1991	ARG	30
		ZBA	50
	1992	ARG	31
	1993	ARG	34
	1994	ARG	11
	1995	ARG	23
	1995	KOH	8
	1996	KOH	45
4	1991	ARG	29
	1991	SOL	50
	1992	SOL	50
	1993	ARG	33
		SOL	65
	1994	ARG	34
		SOL	57
	1995	ARG	31
		KOH	9
		SOL	48
	1996	ARG	33
		KOH	12
		SOL	59
	1997	ARG	44
		CLV	20
		SOL	61
	1998	ARG	37
		SOL	62
	1999	ARG	35
		CLV	20
		DAN2	29
		HAF	46
		SOL	43
	2000	ARG	32
		CLV	30
		DAN2	45
		HAF	37
		KOOT	12
		SOL	46
	2001	ARG	33
		CLV	24
		DAN2	35
		HAF	37
		SOL	54
	2002	ARG	34
		BAL	5
		CLV	25
		DAN2	42
		HAF	39
		SOL	59
	2003	ARG	29
		BAL	21
		CLV	25
		DAN2	28
		SOL	55
	2004	ARG	12
		BAL	30
		CLV	24
		DAN2	33
		DAR	6
		SOL	53
	2005	BAL	39

7 Improvement of database coverage in time and space

An overview over existing national survey data and additional relevant sampling information was made by the participants for each country (Annex 6). These tables compared the data available in DATRAS showed that substantial information exists that could be used to extend data coverage in time, space and number of species (CA).

On a temporal scale, DATRAS included data from 1991– 2005 at time of the workshop. The first BITS database was set up in 2000 based on an EU funded project. In the project, recourses were not sufficient compiling all the historical data and only data from 1991 and onwards were submitted to the database. However, some countries have preformed surveys before 1991 and in e.g. Sweden and Denmark. These data are stored electronically and only resources to compile and validate the data are required in order to submit the data to the DATRAS database. In other cases e.g. in Latvia/Russia, Poland and Germany and, the data are stored as hard copies or in systems where converting the data into the DATRAS exchange format will require more resources. The workshop recommends that the needed recourses are found in order to make the database as comprehensive as possible for the use in stock assessment.

The data reported to DATRAS cover all areas from Subdivisions 22–29. All BITS surveys have been reported except the Danish survey performed by Havfisken in Subdivisions 21–24 in recent years. Kattegat (Subdivision 21) was not included in the original setup of DATRAS, but Swedish data from the IBTS are hosted in DATRAS. As The WGBFAS assesses Kattegat cod e.g., it is recommended to include Subdivision 21 in DATRAS in general. In order for DATRAS to create indices in the future for Kattegat and western Baltic cod these data should be provided by Denmark. These data are particularly important as only Sweden and Denmark sample Subdivisions 21 and 23 and only Denmark and Germany sample Subdivision 22 – with the exclusively the Danes covering the Straits.

The number of species reported to DATRAS was found to be sub-optimal. As seen from Table 6.1 not all countries are reporting the 4 main species (cod, flounder, herring and sprat) to DATRAS that should be uploaded according to the guidelines. A number of countries only reporting cod and flounder as standard while in other cases only cod, herring and sprat are reported. The DATRAS database is often requested for biodiversity studies and with increased request on integrated assessment it is important that the database stores all species caught in the survey. It is therefore recommended that all countries provide information on all the species including bycatch species to the DATRAS database. The focus of the present workshop was cod data, but a similar revision of other species in the database is recommended to optimize their data quality and coverage.

8 Data quality assurance

Screening of national data

Data of the trawl surveys must pass the DATSU screening program of ICES database system before the data can be uploaded to the DATRAS database. The procedures of the DATSU screening program are described in the BITS manual (ICES, 2002) and in the documentation of the DATRAS database (www.ices.dk). These procedures check e.g. whether the data are inside defined ranges. Furthermore, cross checks are made e.g. tow distance calculated based on the positions of the haul is compared with the tow distance based on the combination of the tow duration and the mean velocity during the haul. However, errors may occur, which will be detected by the present screening procedures integrated in the DATSU program. General

check of the basic data e.g. CA data are mostly carried out at institute level before uploading, however, these procedures are not standardised.

Additional tools for screening CA data

An example of an outlier that is not accounted for by the established screening procedures is a cod with a total length of 27 cm and a weight of 920 gram. Both records are inside of the defined range in DATSU. However, it is an outlier according to the general relationship between weight and length, which can be described by the regression model: $W_j = a\ L_j^b\ \varepsilon_j$, where W is the weight, and L is the length of the individual j, and ε represents the error term. Figure 8.1 illustrates the weight-length relationship of cod caught during the German trawl survey in the fourth quarter of 2000. The unrealistic data point (length: 27 cm versus weight: 920 gram) is marked by a circle.

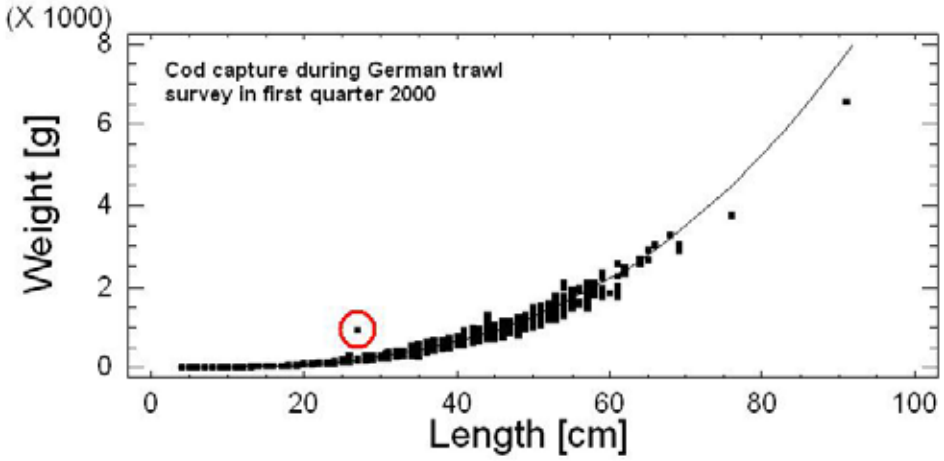

Figure 8.1: Plot of the length-weight relationship of cod. The encircled data point is inside the expected range of DATSU but is an unlikely data combination. The line represents the relationship predicted by the regression model.

Such unreliable data combinations need additional screening tools to be detected. Preliminary additional screening procedures and criteria were developed prior to the workshop (DA_CA_Check.xls) by Rainer Oeberst. The additional screening procedures were discussed and agreed during the workshop. The first checking procedure uses the weight-length relationship by species and survey. After log-normal transformation of weight and length a linear regression model can be fitted to the data (Figure. 8.2).

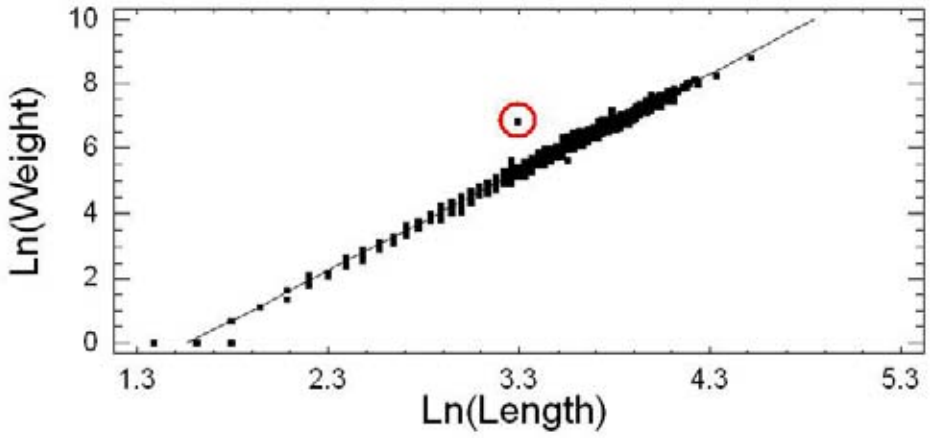

Figure 8.2: Plot of the log-normal transformed weight and length of cod and the relationship fitted by the regression model. The encircled data point is outside of the expected range and is an unreliable data combination.

The residuals, ε_j, of this linear regression that can be calculated as $\varepsilon_j = \ln(W_j) - \ln(a\ L_j^b)$ are expected to follow a normal distribution (Figure 8.3). The standard deviation of the residuals is 0.12 based on 1040 data points. Analyses of data for different species from German surveys suggest that the standard deviation of the residuals varies among surveys (Table 8.1). However, within the surveys and species analysed the standard deviation was close to 0.1.

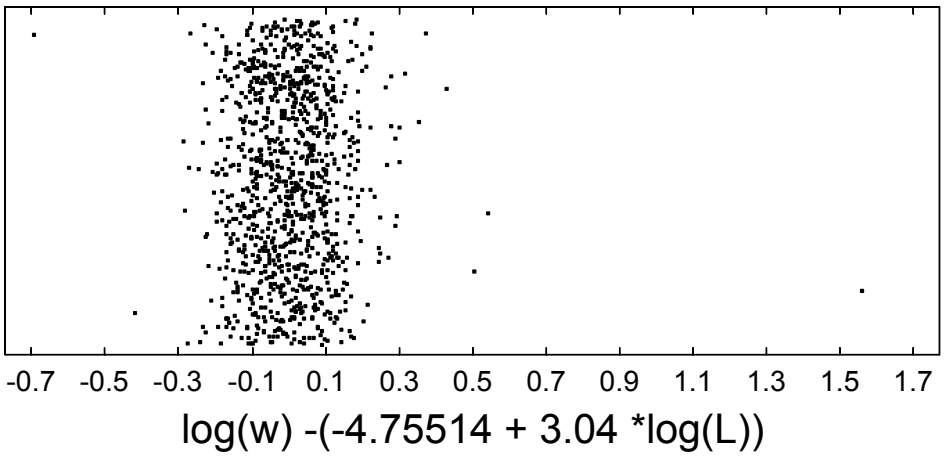

Figure 8.3: Distribution of the residuals of log-normal transformed length-weight data of cod.

Thus, the residuals of the weight-length relation may be used to identify unreliable length-weight combinations in the CA data. Data points can be marked and checked when the absolute value of the residuals is larger than a given limit, $abs(\varepsilon_j) \geq \delta$. It was agreed at the workshop to use a constant value of $\delta = 0.2$ for all species as a starting point (Table 8.2). Further analyses of the data from the trawl survey in 2006 are suggested to optimize the threshold value of δ. All institutes will evaluate how many of the data points that fall in the range of $abs(\varepsilon_j)$ between 0.2 and 0.3 are true outliers or data errors that needs to be corrected. Depending on the outcome of the study new values of δ can be defined by WG BIFS for the different species and areas.

Table 8.1: Estimates of the standard deviation of the residuals, S_r, of length-weight relationship based on German trawl surveys in SD 22, 24 and 25 (partly).

Year	Quarter	Cod	Flounder	Turbot	Plaice
1999	1	0.103	0.124	-	-
1999	4	0.120	0.116	0.100	0.097
2000	1	0.108	0.124	-	-
2000	4	0.121	0.119	0.110	0.091
2002	1	0.105	0.129	0.106	0.094
2002	4	0.125	0.111	0.111	0.086

Table 8.2: Suggested thresholds for checking the weight-length relation by species and area.

Species	Area	Relation	Regression parameter	Data which must be checked
Cod	SD21	$W = aL^b$	based on survey data	$abs(LN(W_j\text{-}aL_j^b)) \geq 0.2$
Cod	SD22, 24	$W = aL^b$	based on survey data	abs(LN(Wj-aLjb)) ≥ 0.2
Cod	SD25 -	$W = aL^b$	based on survey data	abs(LN(Wj-aLjb)) ≥ 0.2
Flounder	SD21	$W = aL^b$	based on survey data	$abs(LN(W_j\text{-}aL_j^b)) \geq 0.2$
Flounder	SD22, 24	$W = aL^b$	based on survey data	abs(LN(Wj-aLjb)) ≥ 0.2
Flounder	SD25 -	$W = aL^b$	based on survey data	abs(LN(Wj-aLjb)) ≥ 0.2
Herring	SD21	$W = aL^b$	based on survey data	$abs(LN(W_j\text{-}aL_j^b)) \geq 0.2$
Herring	SD22, 24	$W = aL^b$	based on survey data	abs(LN(Wj-aLjb)) ≥ 0.2
Herring	SD25 -	$W = aL^b$	based on survey data	abs(LN(Wj-aLjb)) ≥ 0.2
Sprat	SD21	$W = aL^b$	based on survey data	$abs(LN(W_j\text{-}aL_j^b)) \geq 0.2$
Sprat	SD22, 24	$W = aL^b$	based on survey data	abs(LN(Wj-aLjb)) ≥ 0.2
Sprat	SD25 -	$W = aL^b$	based on survey data	abs(LN(Wj-aLjb)) ≥ 0.2

Preliminary analyses of the CA data in the DATRAS database have shown that the conversion of national data to the BITS maturity stages differ among countries (See Section 10). Therefore, screening tools were suggested to ascertain the separation among immature and mature fishes. Two options were discussed. Detection of data points beyond a lower size limit for maturity stage 1 (immature), which may need to be checked. Similarly, a lower size limit could be used for stage 2 (maturing) and 3 (spawning) could be used to check data. Time did not allow a detailed review, but for cod, sprat and herring data preferably histologically based maturity data exist that could be applied as size limits.

Furthermore, a screening procedure to identify outliers the relationship between age and length would be valuable. Unfortunately, no automatic procedure for detecting unreliable data combinations has been elaborated yet. Therefore, it was agreed that x-y plots of age-length data by species and surveys should be checked at the national level, however, there is a need for standardised procedures as age reading among institutes may to differ e.g. double rings

may be interpreted differently and this may be detected for specific years and areas at an early stage by a checking procedure.

The new screening procedures developed by the BIFS working group are intended incorporated in the DATSU screening program when they have been finally checked. At present it recommended at all countries apply the suggested additional data check before submitting data to ICES for inclusion in DATRAS.

9 Reliability of different record types

The demersal trawl surveys are used to estimate fisheries independent stock indices of cod and flatfishes and other required stock parameters like maturity ogives, weight at age etc. in the Baltic Sea and Kattegat. Besides the target species bycatch of herring, sprat and other species is recorded. The catches of pelagic species, which are distributed in the entire water column, are not representatively captured in many cases. However, it is agreed and described in the BITS manual that catches and biological parameter of these species should be reported to ICES. These data are used for different analyses but it is emphasised that the clupeid data are not likely to be representative of the population and cannot be used as reliable estimates of stock abundance or distribution.

To reduce the danger of misinterpretations of the data stored in the DATRAS database, the reliability of the data related to different stock parameters were discussed. A subjective judgement of the reliability of different parameters is presented in Table 9.1 by area, species and survey. The analyses have shown that the reliability of the trawl and acoustic surveys, which are conducted in the Kattegat and in the Baltic Sea concerning the stock indices by age groups, the weight at age and the maturity ogive, can vary among surveys. Therefore, the reliability of the different surveys in the different areas related to the stock parameters are described in Table 9.1 by species and age groups. These overview tables are intended to assist users of the data in their interpretation of the results of analyses based on these survey data.

Table 9.1: Preliminary list of stock parameters which can be estimated based on trawl and acoustic surveys with required accuracy. In case where no judgement could be made a question mark was applied.

A. Kattegat

AREA	SPECIES	SURVEY TYPE	SURVEY PERIOD	POTENTIAL ESTIMATES	RELIABLE YES/NO	AGE GROUPS
SD 21	Cod	Trawl survey	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y Y	1+ 1+ 1+
SD 21	Cod	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N	0+ 1+
SD 21	Flounder	Trawl survey	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	? ? ?	
SD 21	Flounder	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	? ? ?	
SD 21	Herring	Trawl survey	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y Y	1+ 1+ 1+
SD 21	Herring	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N	0+ 0+
SD 21	Sprat	Trawl survey	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y Y	1+ 1+ 1+
SD 21	Sprat	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N	1+ 1+
SD 21	Sprat	Acoustic surveys	May	Stock indices by age groups Weight at age of stock Maturity ogive	? ? ?	
SD 21	Sprat	Acoustic surveys	October	Stock indices by age groups Weight at age of stock Maturity ogive	? ? ?	
SD 21	Herring	Acoustic surveys	October	Stock indices by age groups Weight at age of stock Maturity ogive	? ? ?	

Table 9.1: Continued.

B. Western Baltic Sea

AREA	SPECIES	SURVEY TYPE	SURVEY PERIOD	POTENTIAL ESTIMATES	RELIABLE YES/NO	AGE GROUPS
SD 22–24	Cod	Trawl surveys	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y Y	1+ 1+ 1+
SD 22–24	Cod	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N	0+ 0+
SD 22–24	Flounder	Trawl survey	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y Y	2+ 2+ 2+
SD 22–24	Flounder	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	? ? ?	
SD 22–24	Herring	Trawl survey	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	N Y N	
SD 22–24	Herring	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	N N N	
SD 22–24	Sprat	Trawl survey	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	N N N	
SD 22–24	Sprat	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	N N N	
SD 22–24	Sprat	Acoustic survey	May	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N	
SD 22–24	Sprat	Acoustic surveys	October	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N	
SD 22–24	Herring	Acoustic surveys	October	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N	0+

Table 9.1. Continued.

C. Eastern Baltic Sea

AREA	SPECIES	SURVEY TYPE	SURVEY PERIOD	POTENTIAL ESTIMATES	RELIABLE YES/NO	AGE GROUPS	NOTE
SD 25–32	Cod	Trawl surveys	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y Y	2+ 2+ 1+	
SD 25–32	Cod	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N	1+ 1+	
SD 25–32	Flounder	Trawl survey	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y Y	3+ 3+ 3+	1) 1) 2)
SD 25–32	Flounder	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	? Y ?	2+ 2+ 2+	3) 3) 3)
SD 25–32	Herring	Trawl survey	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	N Y Y		
SD 25–32	Herring	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N	0; 1 0; 1	
SD 25–32	Sprat	Trawl survey	Spring	Stock indices by age groups Weight at age of stock Maturity ogive	N N Y		
SD 25–32	Sprat	Trawl survey	Autumn	Stock indices by age groups Weight at age of stock Maturity ogive	Y N N	0; 1	SD26
SD 25–32	Sprat	Acoustic surveys	May	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N		
SD 25–32	Sprat	Acoustic surveys	October	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N		
SD 25–32	Herring	Acoustic surveys	October	Stock indices by age groups Weight at age of stock Maturity ogive	Y Y N		

1) Hauls less than 20m depth contains almost no 1–2 years fish

2) Depends on hauling depth; maturity ogive is ok for fish larger than 21 m (commercial size/target)

3) Almost all fish which is caught in water depth of less than 40 m depth.

10 Cod maturity and weight at age in the stock

An important objective of the workshop was to evaluate the quantity and quality of cod weight and maturity data stored in DATRAS and plan further work to establish weight at age in the stock (WEST) and maturity ogives for assessment of cod SSB for the Kattegat and Baltic cod stocks. A preliminary analysis was conducted for eastern Baltic stock in the late 1990s, but has not been followed up. A review and an analysis of existing data on cod maturity for the Kattegat, western and eastern Baltic cod stocks was conducted by a sub-group the WGBFAS during 1997 to establish maturity ogives for the stocks (Tomkiewicz *et al*., 1997). The

analysis of maturity data showed that maturity differed substantially among sexes with females maturing at older age than males (Figure 10.1). The analysis also suggested that maturation happens later in life the further east and north the area, i.e. a tendency towards later maturation from SD 21–28 particularly for females. This trend, however, is similar to the effect that would be expected from the documented discrepancies in age reading among countries in the Baltic area. The longevity of females exceeded male and caused a skewed sex ratio with a considerable overweight of females in the older age groups (Figure 10.2). The area differences were considered using a weighted average based on the distribution of the population within the stock. The maturity data applied in the assessment as average combined female and male ogives for 5 years periods in former time and for the years 1995–1997. Differences in the proportion of mature females among time periods are shown in Figure 10.3 – the largest differences were at ages 4 and 5. However, the data series have not been updated since 1997 and the Baltic Fisheries Assessment Working Group (WGBFAS) has urged the need for updated time series for both maturity and weight at age for use in the assessment of Baltic cod stocks.

The data used in the previous analysis of cod data were based on national time series of maturity at age by sex and sex ratio at age, while the updated analysis will be based on the CA records in DATRAS. This allows establishing weight and maturity at length as well as at age in order to test potential effects age reading discrepancies that could interfere with the results. Consequently efforts have been allocated to revise and optimise the DATRAS database as a number of shortcomings were revealed prior to the WGBFAS meeting in 2005 and discussed during the meeting. The cod weight at length information in the CA records for the period prior to 2004 has in some cases been registered as individual fish data and in others as aggregated data. The averaged weight data cause problems for statistical analyses of data and modelling of growth. For some countries weight data had been sampled but had not been submitted to ICES for inclusion in DATRAS. Consequently, the cod weight at length data were deleted from the database for surveys with average weight data except for resubmitted, revised data. The analysis of weight data awaits resubmission at individual level for the remaining countries and surveys.

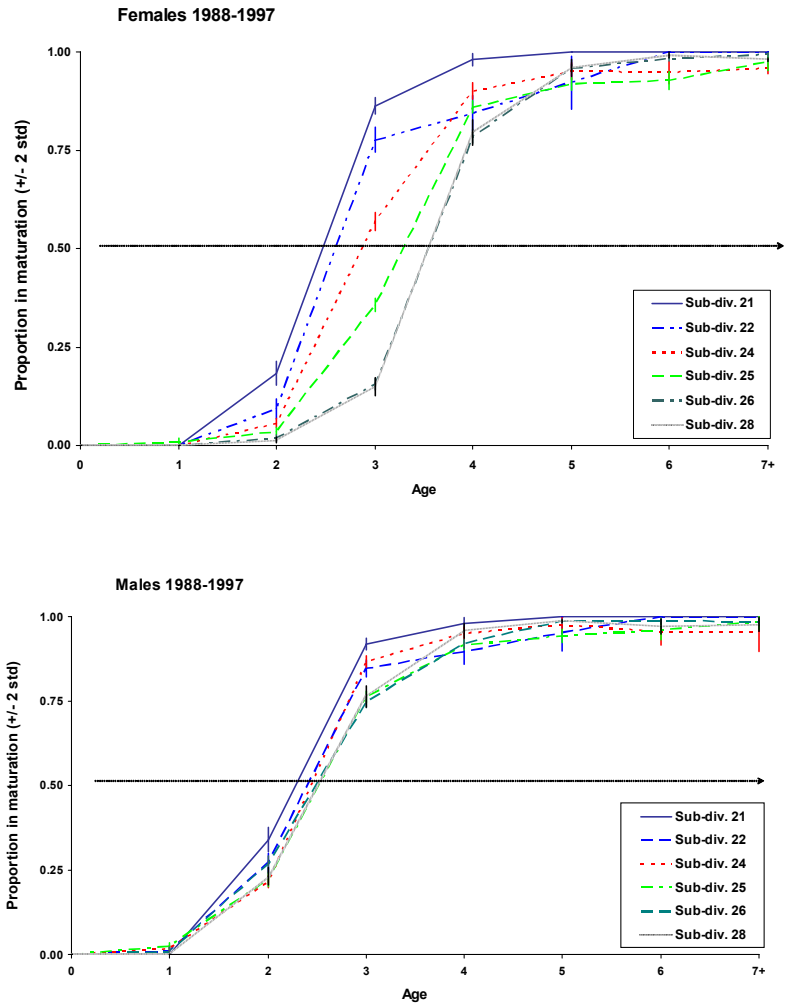

Figure 10.1: Maturity ogives of females and male cod derived from a maturity database based on national BITS data (modified from Tomkiewicz *et al.*, 1997).

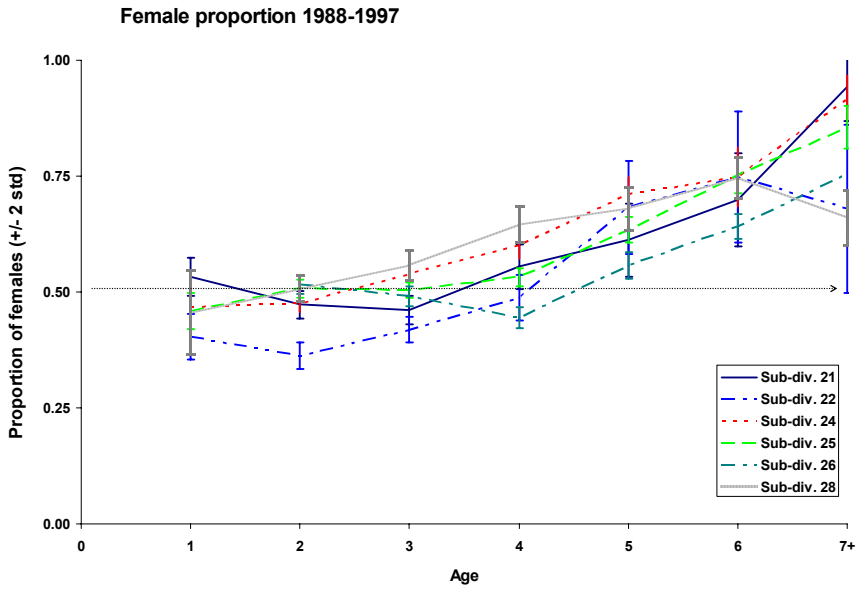

Figure 10.2: Average sex ratio of cod in the stock derived from national BITS data (modified from Tomkiewicz *et al.*, 1997).

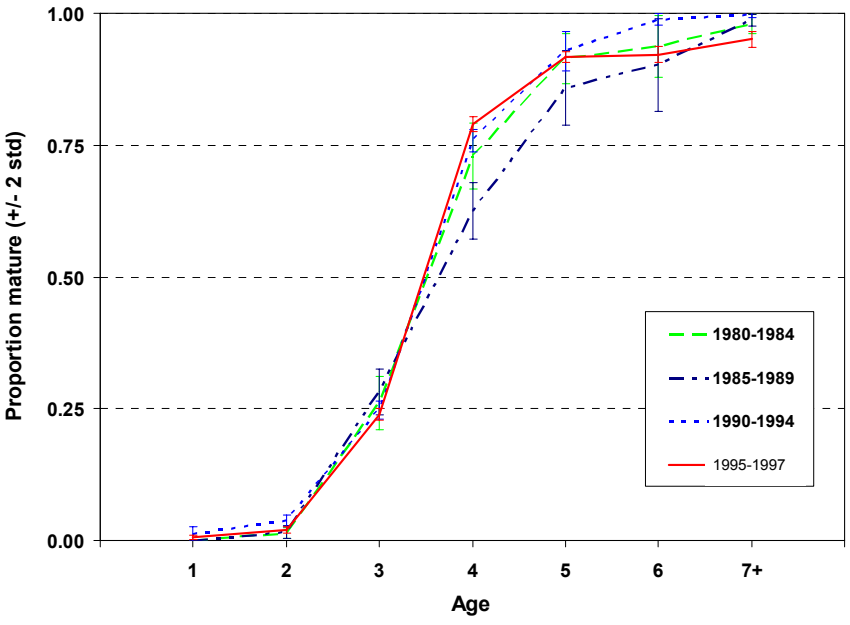

Figure 10.3: Average proportion mature females at age during different time periods in Subdivision 25 based on national BITS data (modified from Tomkiewicz *et al.*, 1997).

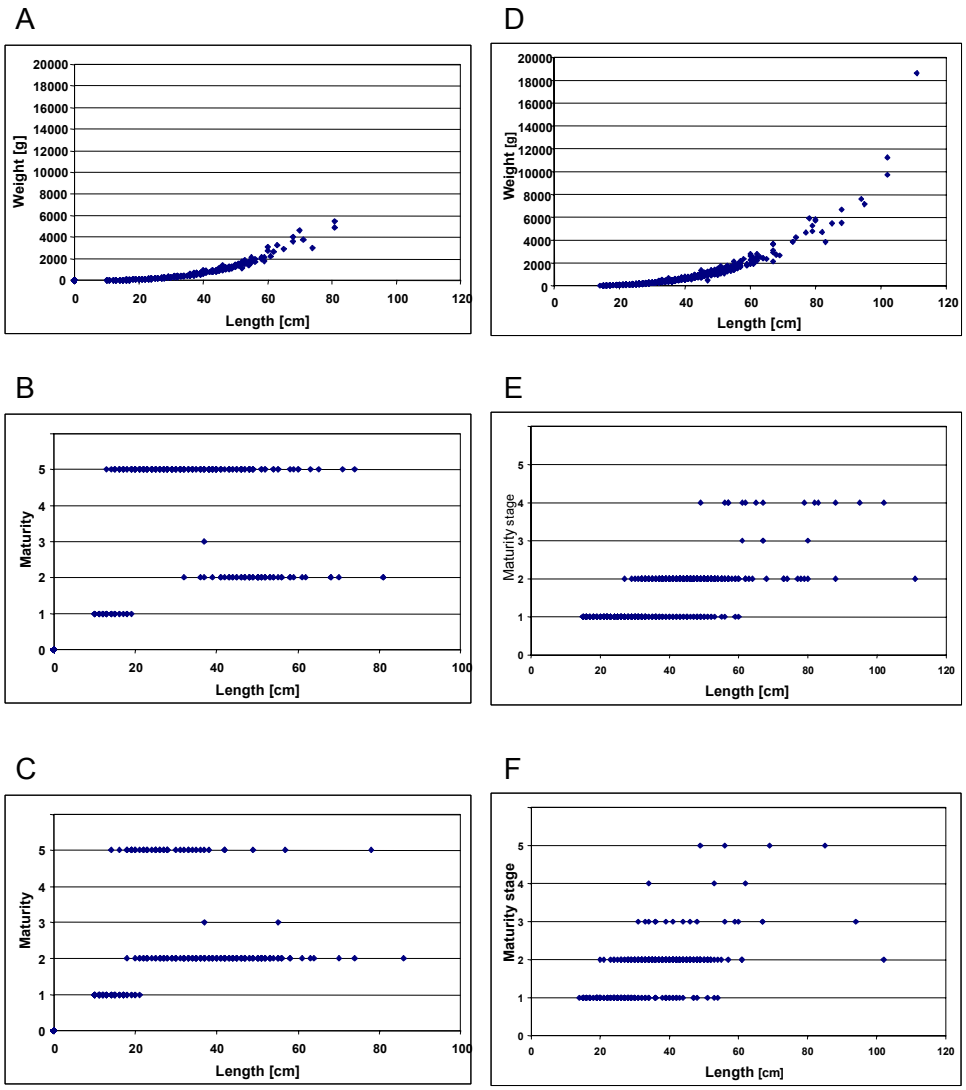

Figure 10.4: Plot of cod weight (A) and female (B) and male (C) maturity against length for Polish BITS data spring 2001 and similar Danish data (D, E and F). The maturity scale refers to 1: immature, 2: maturing, 3: spawning, 4: spent and 5: resting.

The timing of the BITS spring surveys are well suited for sampling cod maturity (Tomkiewicz *et al*., 2003; Table 9.1), as almost all cod will have started the ripening process, but it is still so early that the migration to the spawning areas in the deep basins have not begun. However, the initial analyses of the national maturity data for cod showed some inconsistency in the staging, i.e. the size range of fish tended to differ substantially among national data. Figure 10.4 compares Polish and Danish records from the spring surveys in 2001. While the length-weight relationships are similar, the staging differs substantially due to differences in stage determination. Maturity data are reported to ICES using the 5 level maturity scale described in the BITS manual, but the data are generally sampled according to a national scale and afterwards converted to the BITS scale (1: immature, 2: maturing, 3: spawning, 4: spent and 5: resting). However, the conversion can not be made in a consistent way due to the nature of the national scales. In the example in Figure 10.4, the Polish data are sampled according to the Maier scale that does not separate large immature specimens and resting individuals, because these stages generally are difficult to separate by visual stage determination. During the conversion these fish are converted to stage 5: resting, which intentionally should refer to adults in resting condition in between spawning seasons or omitting spawning. This extends the range to lower sizes compared to the Danish data that separates the large immature and the resting stage using the DIFRES maturity manual (Tomkiewicz *et al*., 2002; 2003). This makes it impossible to establish maturity ogives in the sense that sexually immature and adult fish are distinguished. However, it will be possible to estimate the proportion that will spawn based on the proportion of ripening and spawning specimens in the stock, i.e. the spawning proportion, from the spring BIT-surveys, as almost all cod that will spawn in the approaching spawning season will be ripening or spawning at his time. The maturity and weight data will be analysed by a sub-group of WGBFAS representing the various countries contributing data, when the revision the cod CA data is finalised.

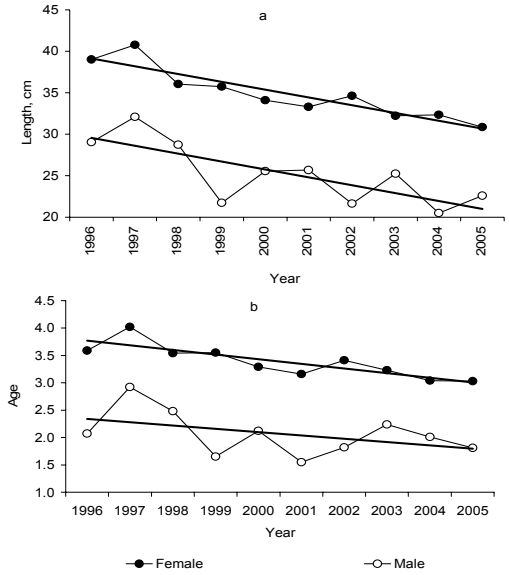

Figure 10.5: Length (a) and age (b) at 50% maturity of male and female cod in 26 SD of Baltic Sea based on Russian spring surveys 1996–2005) (Igor Karpushevskiy, AtlantNIRO, Russia, unpubl. data)

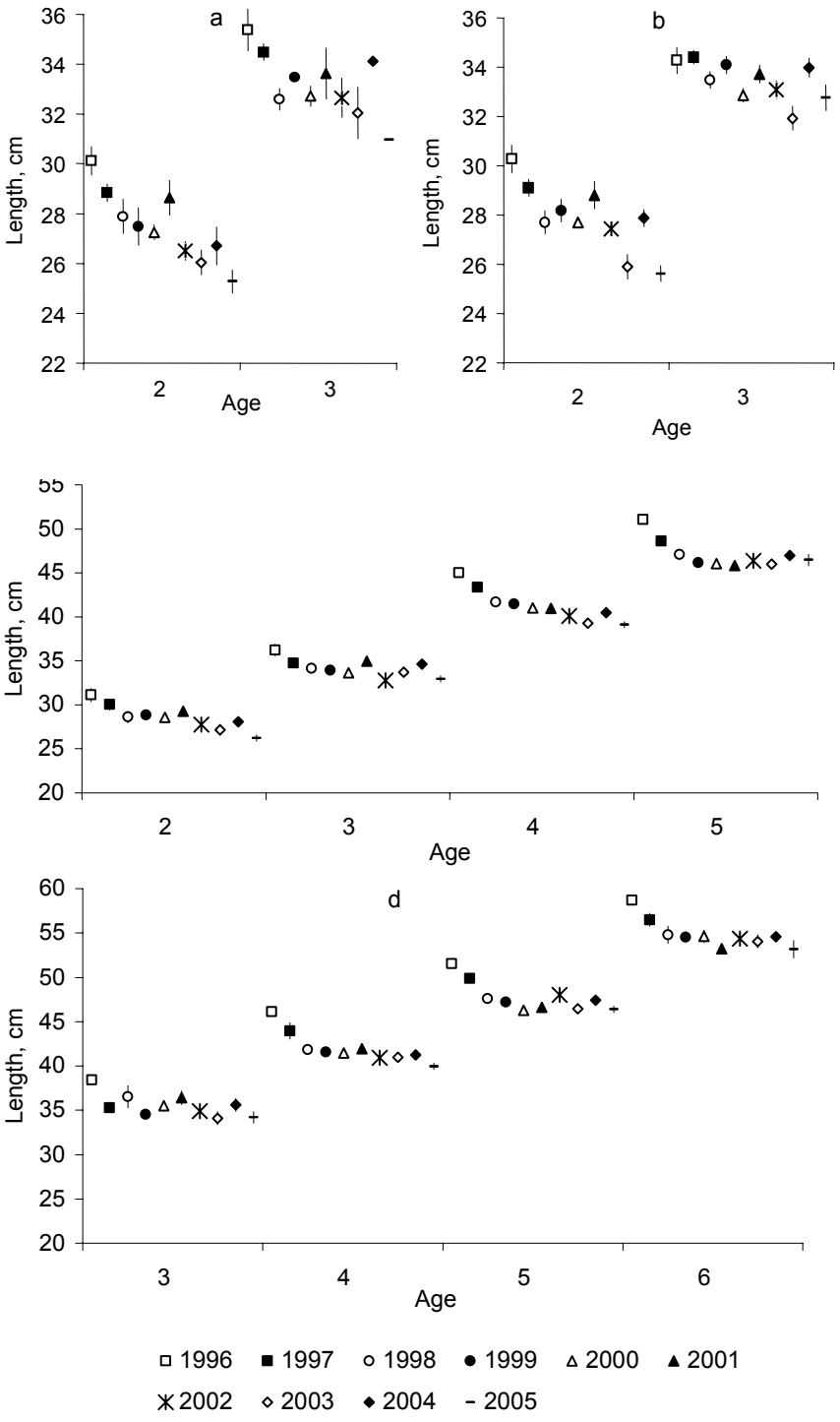

Figure 10.6: Mean length at age for immature male (a) and female (b) cod, and mature male (c) mature cod female (d) in 26 SD of Baltic Sea based on Russian spring surveys 1996–2005 (Igor Karpushevskiy, AtlantNIRO; Russia, unpubl. data)

Preliminary analyses of Russian maturity data show that the trend towards earlier maturation observed from mid 1980s until 1997 (Figure 10.5) has continued in recent years (Figure 10.6). The decrease in age at maturity accompanies a decrease in length at 50% maturity in the stock. The changes in maturation pattern relate to changes in the general population dynamics of the cod stocks both with immature and mature cod being smaller at age (Figure 10.5). These aspects will be considered in the analyses of cod, which are carried out as part of the EU-projects BECAUSE (Critical Interactions Between Species and their Implications for a Precautionary Fisheries Management in a variable Environment - a Modelling Approach) and UNCOVER (Understanding the Mechanisms of Stock Recovery).

11 Sprat and herring maturity and weight at age in the stock

11.1 Information in DATRAS

The data in DATRAS includes catch length and CA data for herring and sprat, but not data from the hydroacoustic surveys. An overview over sprat and herring monitoring data is included in Annex 6. The bottom trawl sampling during the BITS surveys is not considered representative at population level, maturity data from the spring surveys may be useful for establishment of maturity data (Table 9.1, Annex 4 and 6). Maturity and weight at age of herring and sprat was not focus of the workshop and no analyses of data were planned, but review of maturity and weight data of herring and sprat in the Eastern Baltic was provided showing substantial changes in maturation and growth over time. The maturity data used for assessment of sprat and herring were revised some years ago but variable time series are not used in the assessment. The overview tables show that substantial information exist for herring and sprat on a national level and addition data exist from e.g. the EU-project STORE (Environmental and Fisheries Influences on Fish Stock Recruitment in the Baltic Sea), which also includes seasonal egg production estimates derived from ichthyoplankton data.

11.2 Review of herring and sprat maturity and weight at age

As a consequence of changes in seawater temperature, salinity and food resources, the percentage of maturing herring and sprat from different year classes can change in separate populations, but also in relation to sex in the same population (Koshelev, 1971; Polivajko, 1982; Szypuła, 1992; Grygiel and Wyszyński, 2002; 2003a). Mild winters may have modified the maturation of fish - spawning started earlier and more fish spawned earlier than normal, for example as in 1990 with herring in the northern Baltic (Rajasilta *et al*., 1996). The influence of the season in which the first spawning in the life cycle of a given population of fishes take place is usually retained in their "memories" in the following years of life, e.g. in Baltic herring for 3–4 years (Anokhina, 1969). In herring from northern seas, e.g. those from the White Sea, a loss of separateness of spawning seasons often takes place (Cheprakova, 1971).

According to some authors, the process of fish sexual maturation is connected with the following:

- growth rate of fish length and weight, but not their age (Lapin and Jurovitskij, 1959);
- minimum weight and age and geographical location of spawning grounds, e.g. in reference to plaice from the North Sea – this process is susceptible to annual changes (Bromley 2000); age, rather than length, e.g. in reference to cod from the Irish Sea (Armstrong *et al*., 2001).

Over the 1974–1999 period the ICES working groups estimated the Baltic herring (with the exception of the ICES Subdivisions 30 and 31) and sprat stock sizes using constant, fixed and combined sex proportions mature per age groups and for the various ICES Subdivisions

(Anon. 2001a; Table 11.1). This parameter was not verified until 2002. Since 2003, the WGBFAS has assumed that 17% of sprat matures at age 1, 93% at age 2 and the fraction of mature fish at age 3 and older is 100%. However, the results of the study conducted in the Gulf of Finland and in the ICES Subdivision 29 by the Estonian Marine Institute (Tallinn) indicated that the maturity key used by WGBFAS, gives a somewhat higher estimation for the sprat spawning stock biomass (the proportion of mature sprat in the studied northern areas was lower in all age groups and only seldom reached 100%).

At the end of the 1990s, scientists from the most Baltic countries undertook joint investigations of herring and sprat (separately for female and male) maturity ogives as well as the sex ratio in exploited stocks with regard to the age and length structure of fish. In 1999, the ICES Study Group on Baltic Herring and Sprat Maturity (SGBHSM) and the ICES Working Group on Baltic Fisheries Assessment (WGBFAS) initiated these investigations (Anon. 1998, 1999, 2001a, 2001b).

There are a few examples of publications from the last 25 years, which report results of investigations on Baltic herring and sprat sexual maturation and sex ratio versus age and length (Shirokov, 1990; Wyszyński, 1997; Feldman *et al*., 2000; Reglero and Mosegaard, 2001; Grygiel and Wyszyński 2002; 2003a; 2003b; Kaljuste and Raid, 2002).

The periods from January to April and from February to May were designated by Grygiel and Wyszyński (2002; 2003a) as representative of the pre-spawning and spawning seasons for herring and sprat in the southern Baltic, respectively.

The herring biomass of the 1980s was higher in relation to the long-term mean, while that in the 1990s was lower. During this same period, changes in sprat stock biomass were opposite. The lesser decline in herring stock abundance in comparison with biomass was caused by the decrease in the mean weight at age. The high numbers of the few recruiting year classes and the decrease of the mean weight in age groups 2–4 caused a smaller increase in sprat stock biomass in comparison with its abundance.

The average values of the increase (1981) and decrease (1998 – herring, 1997 – sprat) in the mean weight of clupeoids inhabiting the southern Baltic in all the examined age groups (Figures 11.1 and 11.2) in relation to the long-term (1980–2001) mean are listed below:

- increases of 49 and 14% in herring and sprat, respectively – from the Bornholm Basin and of 35 and 30% in the same species, respectively – from the Gdansk Basin;
- decreases of 29 and 23% in herring and sprat, respectively – from the Bornholm Basin and of 28 and 20% in the same species, respectively – from the Gdansk Basin (Grygiel and Wyszyński, 2003a).

The results presented in Grygiel and Wyszyński (2002; 2003a; Table 11.1) papers indicate that there is a greater proportion of sexually mature herring (excluding age group 1) and sprat in younger age groups inhabiting the southern Baltic than was assumed by the ICES working groups up to 2000.

Table 11.1: Proportion (numerical percentage) of mature herring and sprat in younger age groups, assumed by ICES working groups and calculated by Grygiel and Wyszyński (2003a).

	AGE GROUPS >	1	2	3	4
herring	the authors data	0	75–80, Bornholm Basin 82–92, Gdansk Basin	98–100	100
	ICES data	0	70	90	100
sprat	the authors data	26–38, Bornholm Basin 15–18, Gdansk Basin	91–100	100	100
	ICES data	0	70	100	100

As the herring growth rate in weight decreased in 1980–1999, the mean percentage of mature males and females (combined) from age group 2 acceding to first spawning decreased from 79.5 to 74.8 in the Bornholm Basin and from 91.8 to 82.2 in the Gdansk Basin (Grygiel and Wyszyński, 2003a). The mean value of this variable decreased from 88.1 to 80.3% in all the investigated areas. The proportion of mature males and females of herring from age group 2 was about 7–19% higher, on average, in the Gdansk Basin (in the examined groups of years) in comparison to the Bornholm Basin. Moreover, a slightly higher percentage (1–5) of mature males versus mature females was noted in all year groups (except for 1993–1999 in the Bornholm Basin). The proportion of mature herring in older age groups (3–9) ranged from 97.6 to 100.0%. In contrast, the fraction of young mature herring from age group 1 was generally equal to zero.

The investigations conducted by the above-mentioned authors indicate that in comparison to the 1980s, the proportion of sprat from age group 1 entering their first spawning in the 1990s increased by approximately 13% in the Bornholm Basin and by 4% in the Gdansk Basin (Figure 11.3). In contrast, the proportion of sexually mature herring from age group 2 decreased by about 5% in the Bornholm Basin and by 10% in the Gdansk Basin (Figure 11.4). Moreover, the proportion of mature, young clupeoids was about 7–19% higher, on average, for herring and about 5–26% lower, on average, for sprat in the Gdansk Basin than in the Bornholm Basin.

Estonian investigations showed that the mean share of mature sprat increased in the beginning of 1990s and this was observed in all age groups. The earlier maturation of sprat is caused by beneficial hydrological conditions – the beginning of a warm period in the late 1980s in the northern part of the Baltic Sea.

The fraction of mature males from younger sprat age groups in comparison with the fraction of mature females in both the Bornholm Basin and the Gdansk Basin was greater in every period of years analysed by Grygiel and Wyszyński (2003a). For example, in the 1980s and 1990s, the fractions of mature males and females (from age group 1) in the two analysed basins were as follow (in number percentages):

39.5 (1980s) and 57.2 (1990s) for males, and 12.5 (1980s) and 22.1 (1990s) for females from the Bornholm Basin;

21.1 (1980s) and 31.7 (1990s) for males, and 7.6 (1980s) and 6.2 (1990s) for females from the Gdansk Basin.

Moreover, the proportion of mature sprat from age group 1 (except for 1980–1981) was higher in the Bornholm Basin than in the Gdansk Basin, e.g.:

- for males about 18% in the 1980s and 26% in the 1990s, on average;
- for females about 5% in the 1980s and 16% in the 1990s, on average.

The percentage of mature southern Baltic herring and sprat specimens is length dependent, and this percentage increases successively in length classes. The results obtained by Grygiel and Wyszyński (2002; 2003a) indicate that there are statistically significant relationships between these variables (best fitted according to the linear model in regression analysis applied). Similar analyses of results for Baltic herring and sprat were not found in the literature, although results obtained by Torstensen (1998) demonstrate that the maturation of sprat from Norwegian fjords is also length dependent. The length at 50% maturity was 9.3 cm. Sprat from this region normally mature as 1-year-olds at a minimum length of 8.0–9.0 cm. They spawn during the same season as older fish, but start a little later.

The decline of the southern Baltic herring mean weight at age in period 1980–1999 was accompanied by a decrease in the length of first sexual maturation in both males and females. In comparison to the 1980–1984 period, the indicatory length (L50% – 50% of specimens are

mature) of herring decreased by an average of 2.55 cm from 1993–1999, i.e. from 19.7 to 16.7 cm in the Bornholm Basin and from 18.4 to 16.3 cm in the Gdansk Basin (Table 11.2). In comparison to the 1980s, the decline in sprat indicatory length in the 1990s was an average of 0.25 cm, i.e. from 9.84 to 9.66 cm in the Bornholm Basin and from 9.74 to 9.45 cm in the Gdansk Basin. In 1980–1981, the differences in the indicatory length of sprat from the two Baltic basins were 1.22 cm for males and 1.66 cm for females, but in 1996–1997, these differences were smaller by 0.55 cm (males) and 0.83 cm (females). Nearly 100% of the herring males larger than 19.0 cm and females larger than 20.0 cm and sprat males ≥ 10.0 cm and females ≥ 11.0 cm were mature (Grygiel and Wyszyński, 2002; 2003a).

The percentage of young herring (age group 2) and sprat (age group 1) which spawned for the first time in the Bornholm Basin in the 1980–2001 period was dependent on some biotic and abiotic factors (Grygiel and Wyszyński, 2002; 2003a; Figure 11.1). The results of regression analysis indicate that the percentage of mature young sprat was statistically significantly dependent on seawater and air temperatures (in the first quarter) and on sprat stock abundance in age group 1. The same was also found between the percentage of young herring from the spring spawning population which were spawning for the first time and the mean length and weight of fish (in the first quarter).

Physical factors such as the duration of ice cover, seawater temperature and light levels in the sea can also affect fish feeding conditions during winter in the pre-spawning season (Rajasilta *et al*., 1996: Krasovskaya, 2002). These factors are strongly correlated, thus it is difficult to analyse their role separately from the collected data (Rajasilta *et al*., 1996).

The differentiation in the sexual maturation of the southern Baltic herring and sprat in relation to the age and length structure of the exploited stocks, sex, year groups and regions is mostly due to variation in ecological conditions, to selected biotic and abiotic parameters and the specificity of species inhabiting the western and eastern parts of the southern Baltic Sea. In comparison with the 1980s, the mean percentage of sprat from age group 1, which spawn for the first time, increased in the 1990s from 26 to 38% in the Bornholm Basin and from 14 to 18% in the Gdansk Basin (Grygiel and Wyszyński, 2003a). During these two decades, the fraction of herring from age group 2, which began spawning for the first time, decreased from 80 to 75% in the Bornholm Basin and from 92 to 82% in the Gdansk Basin. These results differed from the data used by ICES working groups in 1974–2000.

Table 11.2: Values of herring and sprat length at first sexual maturity ($L_{50\%}$), i.e. length at which 50% of specimens enter the first spawning season in their life cycle (after Grygiel and Wyszyński, 2003a).

Sex	HERRING			SPRAT		
	Years	Length - $L_{50\%}$ [cm]		Years	Length - $L_{50\%}$ [cm]	
		the Bornholm Basin	the Gdansk Basin		the Bornholm Basin	the Gdansk Basin
Males females combined	1980–1984	19.0 19.9 19.7	18.2 18.5 18.4	1980–1981	9.47 10.85 9.78	8.25 9.19 8.54
Males females combined	1985–1989	18.6 18.0 18.4	17.0 17.0 17.0	1991–1992	7.84 10.27 8.09	9.89 10.92 10.22
Males females combined	1993–1999	16.8 16.5 16.7	16.1 16.4 16.3	1996–1997	9.36 10.49 9.66	8.80 9.66 8.99
Males females combined		- - -	- - -	the 1980s	9.73 9.98 9.84	9.57 10.09 9.74
Males females combined		- - -	- - -	the 1990s	9.33 10.29 9.66	9.11 9.78 9.45

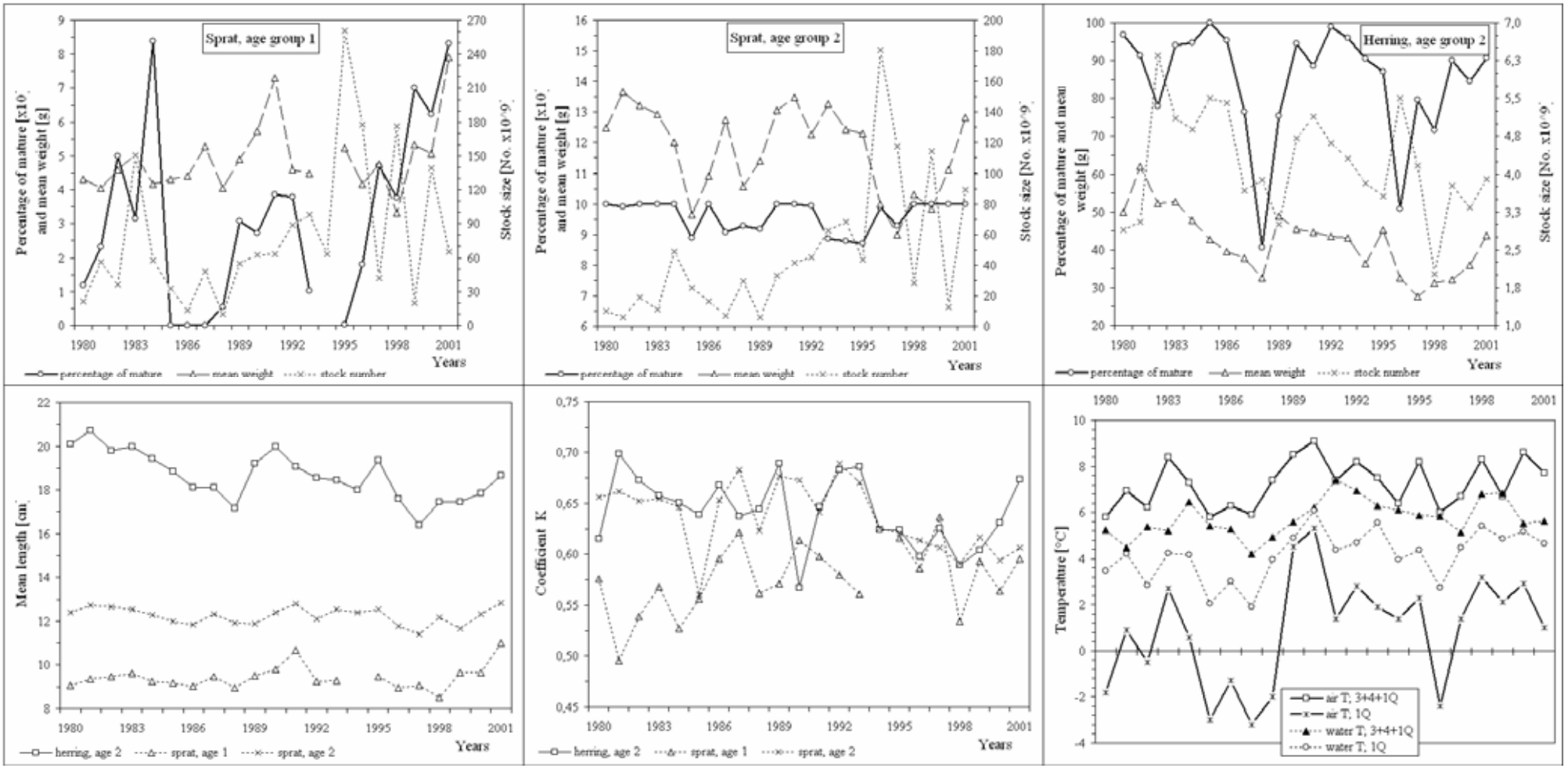

Figure 11.1: Annual (1980–2001) changes of the Baltic sprat and herring stocks abundance, mean weight and length, body condition coefficient, air and seawater temperatures and percentage of mature young clupeoids specimens caught in the Bornholm Basin (after Grygiel and Wyszyński, 2003a).

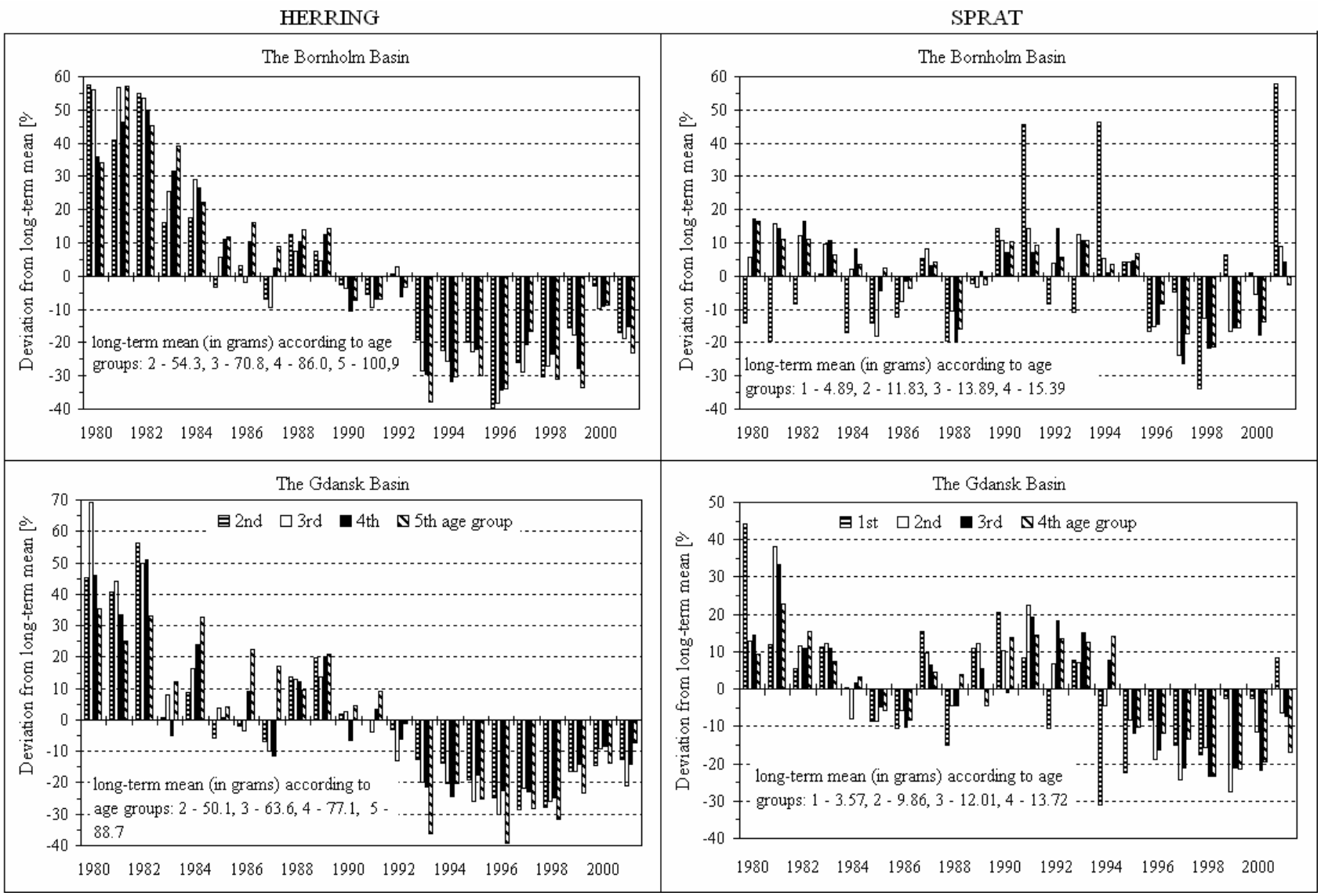

Figure 11.2: Deviation (in %) of mean weight at age of herring and sprat from the long-term (1980–2001) mean; based on sampling results - herring in the second half of the year, sprat in the first quarter; data for age group 1 of sprat from the Bornholm Basin caught in 1990 and 1994 are not fully representative (after Grygiel and Wyszyński, ,2003a).

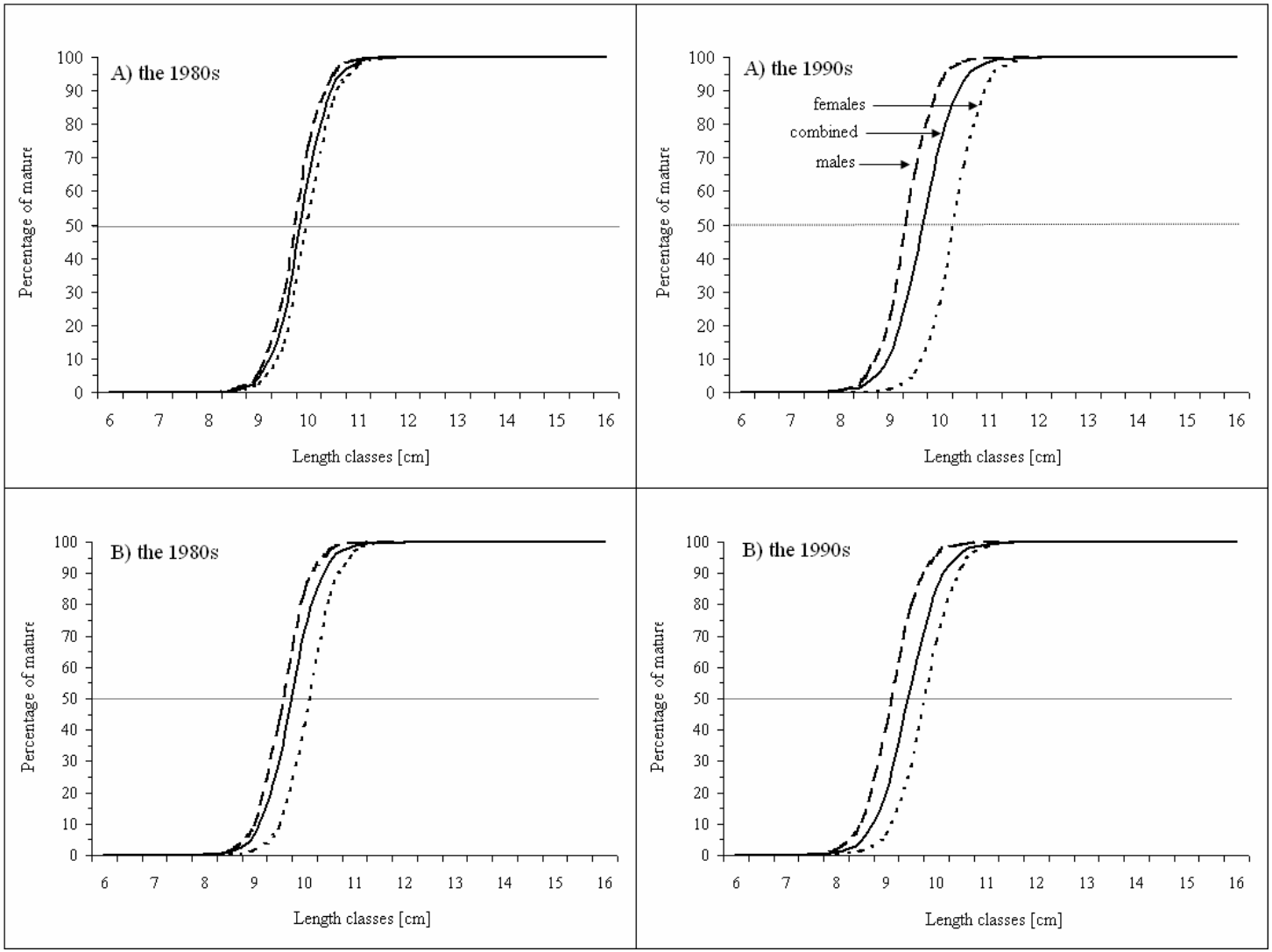

Figure 11.3: Maturity ogives of the sprat males and females caught in the Bornholm Basin (A) and the Gdansk Basin (B) in the 1980s and 1990s vs. length classes (after Grygiel and Wyszyński, 2003a).

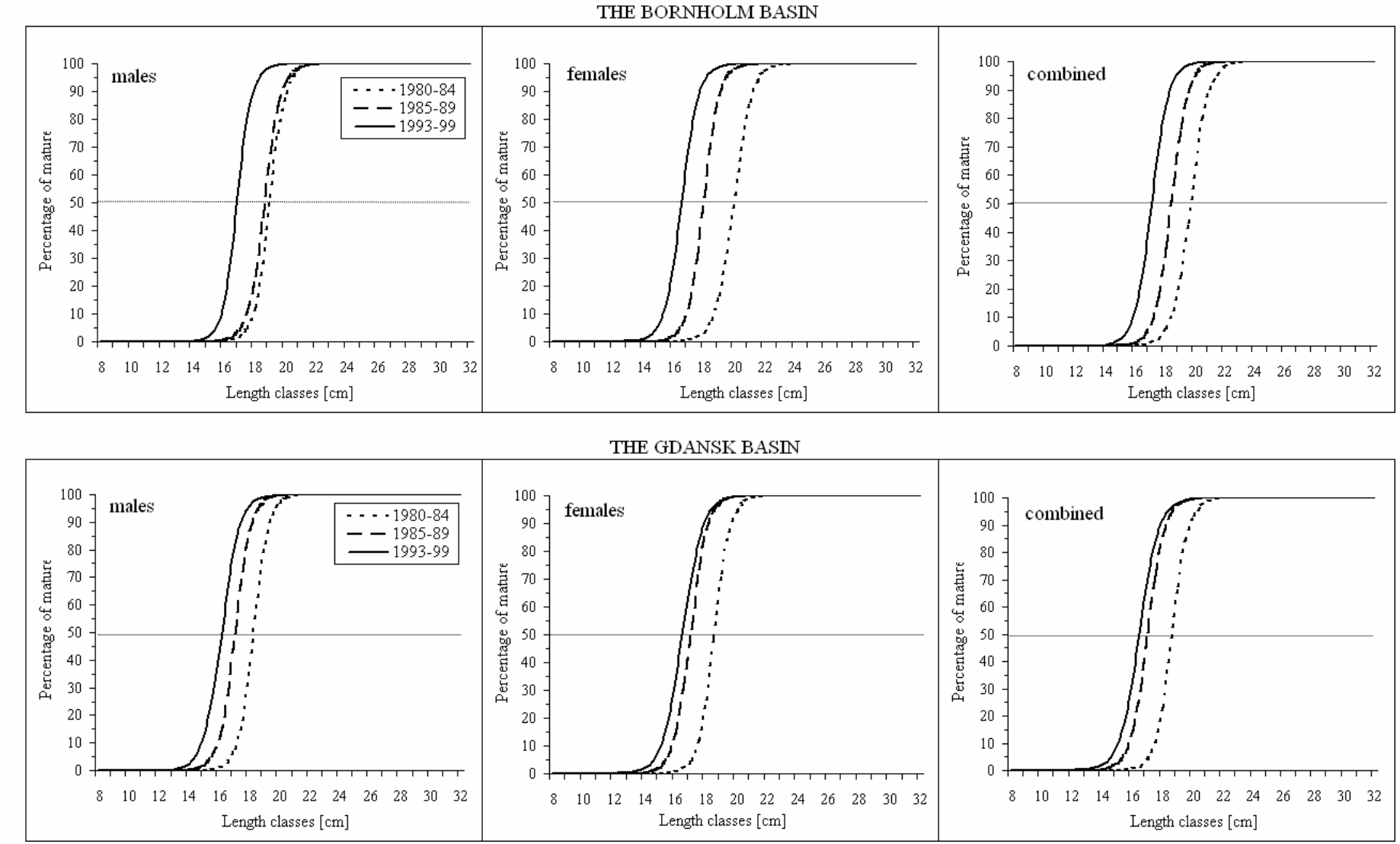

Figure 11.4: Maturity ogives of herring, caught in the Bornholm Basin and the Gdansk Basin in selected groups of years vs. length classes of males and females (after Grygiel and Wyszyński, 2003a).

12 Flatfish maturity and weight at age in the stock

Flatfish data available in DATRAS as CA data including age and maturity are provided in Annex 4 and 5, and additional data in national laboratories are given in Annex 6. The only flatfish data that that were available in sufficient amounts in the DATRAS database at present to produce a more detailed data overview was flounder.

12.1 Flounder

WGBFAS makes a stock assessment of the flounder in 24–25 SD. All other Subdivisions are not assessed presently, which is reported to be due to lack of data. However, there seems not to be a lack of data in general, but lack of reporting to DATRAS and availability of data to the assessment working group. In fact, almost all countries have flatfish landings data from 1991 (http://www.ices.dk/reports/ACFM/2005/WGBFAS/4-Flounder.pdf <table 4.1; page 3 of 27>) and HH, HL and CA data for BITS surveys (following table).

In Table 12.1 the aggregated BITS data concerning flounder from all Baltic countries are presented. Data coverage varies in many SDs and quarter. Presently not all of these data are included in the DATRAS database. That is because many countries used to submit only cod data to the former BITS database, but it has now been agreed that the full data set of all species should be submitted as soon as possible. After this has been accomplished, it could be possible to provide data for assessment of flounder in other SDs as well (26 for instance).

Table 12.1: Availability of data on flounder from different Subdivisions and years.

Flounder data	BITS			L-length	a-age	w-weight	m-maturity		
SD	Quarter	1978	1979	1980	1981	1982	1983	1984	1985
21	I								
21	II								
21	III								
21	IV								
22	I				a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
22	II								
22	III								
22	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
23	I								
23	II								
23	III								
23	IV								
24	I				a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
24	II								
24	III								
24	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
25	I				a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
25	II								
25	III								
25	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
26	I								
26	II								
26	III								
26	IV								
27	I								
27	II								
27	III								
27	IV								
28	I								
28	II								
28	III								
28	IV								
29	I								
29	II								
29	III								
29	IV								

Table 12.1. Continued.

SD	Quarter	1986	1987	1988	1989	1990	1991	1992	1993
21	I								
21	II								
21	III								
21	IV								
22	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
22	II								
22	III								
22	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
23	I						L	L	L
23	II								
23	III						L	L	L
23	IV						L	L	L
24	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
24	II								
24	III						L	L	L
24	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
25	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
25	II								
25	III						L	L	L
25	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
26	I						a,m,L	a,m,L	a,m,w,L
26	II						L		a,m,w,L
26	III						L	L	L
26	IV						L	L	L
27	I						L	L	a,m,w,L
27	II						L		a,m,w,L
27	III						L	L	L
27	IV						L	L	L
28	I						L	L	a,m,w,L
28	II						L		a,m,w,L
28	III						L	L	L
28	IV						L	L	L
29	I								
29	II								
29	III								
29	IV								

Table 12.1. Continued.

SD	Quarter	1994	1995	1996	1997	1998	1999	2000	2001
21	I								
21	II								
21	III								
21	IV								
22	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
22	II								
22	III								
22	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
23	I	L	L	L	L	L	L	L	L
23	II								
23	III	L	L	L	L	L	L	L	L
23	IV	L	L	L	L	L	L	L	L
24	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
24	II								
24	III	L	L	L	L	L	L	L	L
24	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
25	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
25	II								
25	III	L	L	L	L	L	L	L	L
25	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
26	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
26	II	a,m,w,L			a,m,w,L	a,m,w,L	a,m,w,L		
26	III	L	L	L	L	L	L	L	L
26	IV	L	L	L	L	L	L	L	L
27	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
27	II	a,m,w,L			a,m,w,L	a,m,w,L	a,m,w,L		
27	III	L	L	L	L	L	L	L	L
27	IV	L	L	L	a,m,w,L	L	a,m,w,L	a,m,w,L	L
28	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
28	II	a,m,w,L			a,m,w,L	a,m,w,L	a,m,w,L		
28	III	L	L	L	L	L	L	L	L
28	IV	L	L	L	a,m,w,L	L	a,m,w,L	a,m,w,L	L
29	I								
29	II								
29	III								
29	IV								

Table 12.1. Continued.

SD	Quarter	2002	2003	2004	2005
21	I				
21	II				
21	III				
21	IV				
22	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
22	II				
22	III				
22	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
23	I	L	L	L	L
23	II				
23	III	L	L	L	L
23	IV	L	L	L	L
24	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
24	II				
24	III	L	L	L	L
24	IV	a,m,w,L	a,m,w,L	a,m,w,L	A,m,w,L
25	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
25	II				
25	III	L	L	L	L
25	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
26	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
26	II				
26	III	L	L	L	L
26	IV	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
27	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
27	II				
27	III	L	L	L	L
27	IV	L	L	L	a,m,w,L
28	I	a,m,w,L	a,m,w,L	a,m,w,L	a,m,w,L
28	II				
28	III	L	L	L	L
28	IV	L	L	L	a,m,w,L
29	I				
29	II				
29	III				
29	IV				a,m,w,L

In Table 12.2, Lithuanian, Polish and Russian flounder specialists knowledge about flounder data quality is expressed. BITS demersal trawl hauls are usually performed in deep waters (2nd depth strata and deeper). In spring flounder is divided into two groups based on length-age-maturity. 1–2 years old fishes stay in shallow waters less than 20 m, older ones moves to deeper waters. In autumn all age groups are still aggregated in shallow waters. Current BITS survey usually catches older and bigger flounders (spring survey) or very few fishes (autumn survey). In order to obtain an unbiased overview of the flounder population, differences of trawl catches in shallow and deep waters need to be taken into account. And probably, this aspect needs special attention of flounder specialists, if flounder stock assessment should be expanded.

Table 12.2: Overview over flounder data with specialists' evaluation and comments about data quality.

Survey time	Characteristic	Age	Validity	Comments
Spring	Stock indices by age groups	3+	Y	Depends on hauling depth; hauls less than 20m depth contains almost no 1–2 years fish
Spring	Weight at age of stock	3+	Y	Depends on hauling depth; hauls less than 20m depth contains almost no 1–2 years fish
Spring	Maturity ogive	3+	Y	Depends on hauling depth; maturity ogive is ok for fish bigger than 21 cm (commercial size/target)
Autumn	Stock indices by age groups	2+	?	Depends on hauling depth; almost all fish were caught in less than 40 m depth.
Autumn	Weight at age of stock	2+	Y	Depends on hauling depth; almost all fish were caught in less than 40 m depth.
Autumn	Maturity ogive	2+	?	Depends on hauling depth; almost all fish were caught in less than 40 m depth.

In order to support the suggested BITS survey flounder data interpretation, the following table was made. DATRAS flounder catch data from the period 1999–2005, I quarter, all ships, all SDs were pooled, i.e. only hauls containing flounder. The table indicates that the length and probably also the age composition in the BITS survey catches depends on the hauling depth (Table 12.3). More detailed investigation is needed to evaluate data.

Table 12.3: Depth stratification of hauls with flounder catches and avg. length (+ std.) of flounder per stratum.

Hauls depth	Avg. length (cm)	Std. avg. length	No. of fish measured
<40 m	20.8	0.0192	66824
>41 m	25.5	0.0048	460120

13 Improvement of maturity sampling and data analysis

Maturity determination of cod and other species is made according to national scales and afterwards converted into the BITS maturity scale in different ways. In order to improve the maturity staging of the 4 BITS target species a sampling program and two related workshops are suggested. Sampling of cod, sprat, herring and flounder should be performed during the autumn and spring BITS survey and herring and sprat in addition during the acoustic surveys in May-June. The gonads should be photographed with a size indication and the gonads preserved in histo-buffered formalin or Bouin's fluid for histological examination in the laboratory. Institutes that do not perform histological studies will send their samples to Denmark, Russia and Sweden for analysis. A workshop in August/September 2007 would be held to compare staging, pictures and histological results. The tissue analysis will serve as evidence of correct staging as this method is very precise. This way, a comparison between the stage determinations made on national scales can be converted into the BITS scales in a consistent way. The BITS scales may also be revised by the workshop. A second workshop is suggested in spring 2008, in order to stage fish in practice. The workshop should be held at an institute with access to fresh catches of the species e.g. from a chartered fishing vessel. Accuracy in staging and the possible support of light microscopy would be applied.

In addition, it would be useful to analyse the sampling size and sampling frequency needed to obtain reliable estimates of maturity of cod, herring, sprat and flounder. For some species, e.g. sprat the maturity can vary considerably among years, while for others trends over time are obvious. Also substantial variation seems to exist between areas for all species. As all species show significant sexual dimorphism with males maturing earlier than females for all species it is important to analyse data by sex. In fact, all countries sample and provide maturity data by sex, which makes it possible to apply sex ratios and female maturity ogives to estimate the female spawning stock biomass. The present procedure that uses a combined female and male spawning stock biomass ignores that females mature later than males. Since the spawning stock serves as an indicator of the egg production, the combined female and male SSB used in assessment, tend to overestimate the egg production particularly in the heavily fished stocks where the elder cohorts are strongly reduced. This will bias the stock recruitment relationships, which are basis for biological reference point and management decision rules.

14 Conclusions and recommendations to the WGBIFS

The Workshop participants agreed that the data revision should continue and the present work on BITS demersal trawl surveys in SD 21–25 for the period 1995–2005 should be finalised in August/September including the ongoing revision of cod weight data. It was agreed that further work on data quality check for other species is needed and a revision of flounder data was planned to be finished in 2007. The inclusion of existing survey data from the period before 1991 into the DATRAS database and an extension to cover more species than at present also for the period 1991–2005, was discussed. It was suggested that the extension in time, space and number of species should be considered by the WGBIFS and potentially included in the Terms of Reference of the WG for 2007 in relation to a follow up on the data revision. The extension of the database back in time might be useful for calculation of survey indices, but will be resource requiring e.g. in cases where only handwritten records exist. In the light of a future open database policy this investment may, however, not be desirable for the national institutes.

In order to improve the maturity staging of the 4 BITS target species, a sampling program and two related workshops were suggested. Sampling of cod, sprat, herring and flounder could be performed during autumn and spring BITS survey and herring and sprat in addition during the acoustic surveys in May-June. The gonads should be photographed with a size indication and the gonads preserved in histo-buffered formalin or Bouin's fluid for histological examination in the laboratory. Institutes that do not perform histological studies will send their samples to Denmark, Russia and Sweden for analysis. A workshop in August/September 2007 would be held to compare staging, pictures and histological results. The tissue analysis will serve as evidence of correct staging as this method is very precise. This way a comparison between the stage determinations made on national scales can be converted into the BITS scales in a consistent way. The BITS scales may also be revised by the workshop to avoind to present inconsistency in the staging. A second workshop is suggested in spring 2008, in order to stage fish in practice. The workshop should be held at an institute with access to fresh catches of the species e.g. from a chartered fishing vessel. Accuracy in staging and the possible support of light microscopy would be applied.

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Annex 2: Agenda

Tuesday, 31 January 2006 (at SFI - Boris Dixon conference room, VIII floor)

10.00 Opening of the workshop by Rainer Oeberst, Jonna Tomkiewicz and Wlodzimierz Grygiel.

Welcome and practical information.

Adoption of the agenda.

Introduction based on the terms of reference of the workshop, the work planned during the last WGBIFS and the related activities during autumn and winter.

- Ascertain the data quality of data stored in the ICES database related to BIFS
- Improve the database coverage in time and space.
- Perform initial analysis of cod weight and maturity at age for use in the assessment WG.
- Discuss and summarize further needs for maturity data and weight at age for species covered by BITS.

11.00 Coffee break

11.20 Current status of the reworking of the database (countries, area, years, surveys, species, etc.) – 15–20 minutes per country.

Status of German data by Rainer Oeberst.

Status of Danish data by Henrik Degel and Jonna Tomkiewicz.

Status of Swedish data by Barbara Bland.

Status of Russian data by Igor Karpushevskiy.

Status of Latvian data by Ivo Sics.

13.00 Lunch break

14.00 Current status – continued…

Status of Estonian data by Tiit Raid.

Status of Lithuanian data by Domas Morciunas.

Status of Polish data by Wlodzimierz Grygiel.

Contributions from ICES about DATRAS and data status by Lena Larsen.

Discussion of problems identified.

15.00 Coffee break

15.15 General discussion of the aim of the trawl surveys and their databases. Some persons are of the opinion that all problems can be solved with the database. This is not true. Therefore it is useful to describe the potential of the trawl surveys as they are realised now. What are the target species?

In this context, it will be useful to discuss and summarize for which species further effort is needed to provide maturity ogives and weight at age, which times of the year are the best for estimating maturity ogives for the species, and how is the quality of the data stored in the database for these species.

17.00 End of the day.

Wednesday, 1 February 2006

09.00 Practical work to collect and combine updated data and information (Rainer).

Identification of further work required to ascertain the data quality of existing data and improve the database coverage in time and space.

Agreement on standard procedures that can be used to detect unreliable data in the CA datasets on national basis.

Establishment of a procedure that provides an overview to check whether all survey data (institutes, areas, periods, species, variables,...) are stored in the database.

11.00 Coffee break

11.15 Practical work and discussion continued….

13.00 Lunch break

14.00 Availability and quality of data for estimating maturity ogives and weight at age (WEST) for different species in the database, identification of species to be considered by the WGBIFS, and methodology to be used. (Jonna)

Discussion about status of cod weight and maturity data at length and age.

Discussion about the availability of maturity and weight data for flatfishes (possibly only flounder?) and their potential application.

Discussion about the availability and quality of clupeid weight and maturity data from bottom trawl surveys and their applicability.

15.00 Coffee break

15.15 Division into sub-groups according to previous discussion to work on:

a) initial analysis of cod weight and maturity at age for use in the assessment WG,

b) discuss and evaluate the availability of maturity and weight data for flatfishes in the database, their potential application and potential future efforts,

c) further discuss and summarize the availability and quality of clupeid weight and maturity data, evaluate sampling strategy and timing of sampling in relation to existing knowledge.

17.00 End of the day.

Thursday, 2 February 2006

09.00 Continued work in sub-groups on cod, flatfish and clupeid maturity and weight at length and age.

11.00 Coffee break

11.15 Continued work in sub-groups.

13.00 Lunch break

14.00 Continued work in sub-groups.

15.00 Coffee break

15.15 Finalize work in sub-groups.

17.00 End of the day.

Friday, 3 February 2006

09.00 Report and present the progress made on cod, flatfish and clupeid weight and maturity at age.

- evaluation of data, information and their applicability,
- data and methodology suited for estimation of weight and maturity at age,
- plans for finalizing the work,
- future efforts required concerning sampling strategy and timing of sampling, etc.

11.00 Coffee break

11.15 Discussion and proposals concerning tools, which should be available in the DATRAS system like routine procedures for estimating maturity ogives, weight at age, etc. and related necessary data quality check.

Discussion on the reporting and closing remarks.

12.30 End of the workshop

Annex 3: Workshop Terms of Reference 2006

The term of reference of the WGBIFS Workshop in Gdynia 2006:

- ascertain the BIFS data quality in DATRAS by species, area and record type;
- improve the database coverage in time and space and;
- perform initial analysis of cod maturity ogives and weight at age (WEST) for use in the assessment WGs.

In addition, the potential for utilisation of BIFS data to establish maturity ogives and weight at age for other species (flatfishes and clupeids) might be evaluated.

Annex 4: Number of maturity records in DATRAS

A. CA data (SMALK) without maturity

BITS			
Quarter	Country	Species	Number
1	DEN	161789	36
		164712	7992
		172902	1385
		173001	40
	GFR	161722	2005
		161789	3203
		164712	698
		172749	8
		172881	522
		172894	2573
		172902	672
		616195	424
	LAT	164712	419
		172894	4
	LTU	161722	8
		161789	94
		164712	20
		172894	3
	POL	161722	4
		161789	3
		164712	391
		172894	13
	RUS	164712	9
	SWE	161722	1
		164712	1068
2	EST	164712	2
		172894	14
	GFR	172881	100
	LAT	164712	155
		172894	19
	POL	164712	1
3	LAT	164712	31
	SWE	164712	463
4	DEN	161722	29
		161789	310
		164712	114
		172902	1765
		173001	89
	EST	172894	8
	GFR	161722	1811
		161789	3370
		164712	38
		172881	912
		172894	1438
		172902	519
		616195	538
	LAT	164712	170
	LTU	161722	30
		164712	242
		172894	10
	SWE	161722	11
		164712	932

B. Number of maturity records for cod in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
DEN	DAN2	GRT	1999	1697
			2000	2669
		TVL	1999	159
			2001	943
			2002	855
			2003	427
			2004	911
			2005	1905
	HAF	TVS	2000	694
			2001	475
			2002	297
GFR	CLP	SON	1993	411
			1994	161
			1995	349
			1997	199
	SOL	H20	1993	1497
			1994	1654
			1995	1434
			1996	1298
			1997	519
			1998	995
			1999	975
			2000	1126
		SON	1994	240
			1999	550
		TVS	2001	1144
			2002	1216
			2003	1124
			2004	1185
			2005	1527
LAT	BPE	LBT	1993	295
	CLV	LBT	1999	404
			2000	314
		TVS	1999	26
			2000	129

			2001	237
			2002	409
			2003	287
			2004	712
			2005	419
	MONL	DT	1995	418
			1996	305
	ZBA	LBT	1991	682
LTU	DAR	TVS	2005	99
POL	BAL	P20	1994	823
			1995	737
			1996	1394
			1997	1555
			1998	1587
			1999	772
			2000	437
			2001	139
		TVL	1999	298
			2000	81
			2001	371
			2002	355
			2003	609
			2004	451
			2005	643
	GDY	P20	1991	847
			1992	46
			1993	657
RUS	ATL	HAK	1997	856
			1999	534
			2000	510
		TVL	2001	2105
			2003	513
			2004	763
			2005	815
	ATLD	HAK	1998	829
	MON	DT	1995	550
			1996	744
	VSH	TVL	2002	406
SWE	ARG	FOT	1991	383
			1992	68
			1993	251
			1994	717
			1996	1546
			1997	1321
			1998	1096
			1999	1041
			2000	225
		GOV	1991	113
			1992	405
			1993	261
			1994	581
			1995	1350
			1999	248
			2000	1045
		TVL	1999	52
			2001	1036
			2002	1023
			2003	1049
			2004	1308
			2005	975

BITS quarter 2

Country	Ship	Gear	Year	Number
EST	KOOT	TVS	2000	7
GFR	CLP	SON	1996	184
LAT	BPE	LBT	1993	57
		LPT	1993	22
	CLV	LBT	1997	198
			1998	132
			1999	35
		TVS	1999	40
	MONL	DT	1994	300
	ZBA	LBT	1991	32
POL	BAL	P20	1996	155
RUS	ATL	HAK	1997	28
	ATLD	HAK	1998	3
	MON	DT	1993	404
			1994	837

BITS quarter 3

Country	Ship	Gear	Year	Number
LAT	ZBA	LBT	1991	405
SWE	ARG	FOT	1991	340
			1993	244
			1994	463
		GOV	1992	413
			1993	298
			1995	911

BITS quarter 4

Country	Ship	Gear	Year	Number
DEN	DAN2	GRT	2000	34
		TVL	1999	829
			2000	1082
			2001	853
			2002	962
			2003	414
			2004	2809
	HAF	TVS	1999	485

			2000	356
			2001	193
			2002	226
EST	KOOT	TVS	2000	41
GFR	SOL	H20	1991	308
			1992	1171
			1993	1189
			1994	1048
			1995	711
			1996	833
			1997	750
			1998	816
			1999	1003
			2000	1040
		SON	1993	125
			1994	226
			1995	71
			1996	128
			1997	212
			1998	397
		TVS	2001	1056
			2002	906
			2003	1194
			2004	1213
LAT	CLV	LBT	1997	369
			1999	87
			2000	385
		TVS	1999	25
			2000	104
			2001	389
			2002	138
			2003	403
			2004	430
LTU	DAR	TVS	2004	174
POL	BAL	TVL	2002	285
			2003	388
			2004	470
			2005	522
SWE	ARG	FOT	1991	378
			1993	199
			1994	1123
			1995	1577
			1996	1045
			1997	1215
			1998	1168
			1999	451
		GOV	1993	260
			1996	173
			1999	737
			2000	1192
		TVL	2001	848
			2002	861
			2003	866
			2004	672

C. Number of maturity records for herring in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
DEN	DAN2	TVL	2001	583
GFR	SOL	H20	1993	225
			1996	591
			1997	234
			1998	733
			1999	506
			2000	216
LTU	DAR	TVS	2005	318
POL	BAL	P20	1994	468
			1995	1133
			1996	837
			1997	1174
			1998	602
			1999	958
			2000	837
		TVL	1999	169
			2000	145
	GDY	P20	1991	330
			1992	189
			1993	836
RUS	ATL	HAK	1997	402
			1999	634
			2000	894
		TVL	2001	1518
			2005	1562
	ATLD	HAK	1998	938
	MON	DT	1995	741

BITS quarter 2				
Country	Ship	Gear	Year	Number
EST	KOH	ESB	1995	754
			1996	406
POL	BAL	P20	1996	282
RUS	ATLD	HAK	1998	100
	MON	DT	1993	786
			1994	276

BITS quarter 3				
Country	Ship	Gear	Year	Number
EST	KOH	ESB	1995	51
			1996	1405

BITS quarter 4				
Country	Ship	Gear	Year	Number
DEN	DAN2	GRT	2000	46
		TVL	2000	643
			2001	571
			2002	635
			2004	524
EST	KOH	ESB	1995	290
			1996	253
GFR	SOL	H20	1992	343
			1996	514
			1997	541
			1998	741
			1999	589
			2000	578
LTU	DAR	TVS	2004	190
SWE	ARG	FOT	1991	1624

D. Number of maturity records for sprat in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
GFR	SOL	H20	1997	109
LTU	DAR	TVS	2005	162
POL	BAL	P20	1994	500
			1995	293
			1996	100
			1997	402
			1998	475
			1999	349
			2000	323
		TVL	1999	161
			2000	51
	GDY	P20	1991	508
			1992	243
			1993	517
RUS	ATL	HAK	1999	489

BITS quarter 2				
Country	Ship	Gear	Year	Number
EST	KOH	ESB	1995	121
POL	BAL	P20	1996	85
RUS	MON	DT	1994	155

BITS quarter 4				
Country	Ship	Gear	Year	Number
DEN	DAN2	TVL	2004	200

E. Number of maturity records for dab in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
GFR	SOL	TVS	2004	275

BITS quarter 4				
Country	Ship	Gear	Year	Number
GFR	SOL	H20	1996	323
			1998	28
			2000	190
		SON	1996	117
			1998	239

F. Number of maturity records for flounder in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
GFR	SOL	H20	1996	743
			1997	378
			1998	950
			1999	900
			2000	881
		TVS	2001	547
			2002	925
			2003	540
			2004	467
			2005	554
LAT	BPE	LBT	1993	377
	CLV	LBT	1999	250
			2000	248
		TVS	1999	24
			2000	99
			2001	156
			2005	155
	MONL	DT	1995	332
			1996	304
LTU	DAR	TVS	2005	81
POL	BAL	P20	1994	195
			1995	397
			1996	163
			1997	289
			1998	321
			1999	261
			2000	399

		TVL	1999	49
			2000	113
			2001	158
			2002	118
			2003	242
			2004	199
			2005	209
	GDY	P20	1991	223
			1992	72
			1993	145
RUS	ATL	HAK	1997	790
			1999	915
			2000	841
		TVL	2001	2571
			2003	1003
			2005	1012
	ATLD	HAK	1998	661
	MON	DT	1995	752
			1996	883
	VSH	TVL	2002	860

BITS quarter 2				
Country	Ship	Gear	Year	Number
EST	KOOT	TVS	2000	206
LAT	BPE	LBT	1993	95
	CLV	LBT	1997	137
			1998	286
			1999	147
		TVS	1999	72
	MONL	DT	1994	291
POL	BAL	P20	1996	59
RUS	ATLD	HAK	1998	184
	MON	DT	1993	125
			1994	148

BITS quarter 4				
Country	Ship	Gear	Year	Number
DEN	DAN2	GRT	2000	7
		TVL	2000	399
EST	KOOT	TVS	2000	465
GFR	SOL	H20	1995	445
			1996	500
			1997	490
			1998	471
			1999	378
			2000	317
		TVS	2001	653
			2002	627
			2003	508
			2004	538
LAT	CLV	LBT	1997	159
			1999	140
			2000	199
		TVS	2000	149
LTU	DAR	TVS	2004	117
POL	BAL	TVL	2002	113
			2003	176
			2004	187
			2005	225

G. Number of maturity records for plaice in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
GFR	SOL	H20	1996	273
			1997	168
			1998	187
		TVS	2001	246
			2002	157
			2003	272
			2004	190
RUS	ATL	TVL	2001	1
			2005	5

BITS quarter 4				
Country	Ship	Gear	Year	Number
GFR	SOL	H20	1995	192
			1996	297
			1998	168
			1999	196
			2000	155
		TVS	2001	50
			2002	209
			2003	310
			2004	326

H. Number of maturity records for turbot in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
GFR	SOL	H20	1997	59
			1998	99
		TVS	2001	58
			2002	59
			2003	41
			2004	66
			2005	48
LAT	CLV	TVS	2005	17

RUS	ATL	HAK	2000	9
		TVL	2001	29
	MON	DT	1996	69

BITS quarter 4				
Country	Ship	Gear	Year	Number
GFR	SOL	H20	1996	196
			1998	117
			1999	70
			2000	82
		SON	1996	7
		TVS	2001	49
			2002	162
			2003	99
			2004	130

Annex 5: Number of age records in DATRAS

A. CA data (SMALK) without age

Country	Ship	Gear	Species	Number
DEN	DAN2	GRT	161722	1
			164712	9
		TVL	161722	41
			161789	1
			164712	294
			172894	3
	HAF	TVS	164712	1
			172902	6
EST	KOH	ESB	161722	1044
LTU	DAR	TVS	161722	29
			164712	240
			172894	17
RUS	ATL	TVL	164712	1505
			172894	1335
SWE	ARG	FOT	161722	13
			164712	33
		GOV	161722	1
			164712	14
		TVL	164712	6

B. Number of age records for cod in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
DEN	DAN2	GRT	1995	2160
			1996	1615
			1997	1625
			1998	2525
			1999	1695
			2000	2690
		TVL	1999	159
			2001	943
			2002	855
			2003	430
			2004	656
			2005	1902
	HAF	TVS	2000	700
			2001	476
			2002	297
GFR	CLP	SON	1992	75
			1993	411
			1994	161
			1995	349
			1997	199
	SOL	CHP	1992	49
		H20	1992	455
			1993	1497
			1994	1654
			1995	1434
			1996	1298
			1997	519
			1998	995
			1999	975
			2000	1126
		SON	1992	119
			1994	240
			1999	550
		TVS	2001	1144
			2002	1216
			2003	1124
			2004	1185
			2005	1527
LAT	BPE	LBT	1993	315
	CLV	LBT	1999	404
			2000	318
		TVS	1999	31
			2000	134
			2001	237
			2002	409
			2003	287
			2004	794
			2005	420
	MONL	DT	1995	418
			1996	306
	ZBA	LBT	1991	983
LTU	DAR	TVS	2005	114
POL	BAL	P20	1994	955
			1995	781
			1996	1468
			1997	1607
			1998	1590
			1999	772
			2000	437
			2001	139
		TVL	1999	298
			2000	81
			2001	371
			2002	355
			2003	609

			2004	451
			2005	643
	GDY	P20	1991	906
			1992	46
			1993	684
RUS	ATL	HAK	1997	856
			1999	535
			2000	510
		TVL	2001	608
			2003	513
			2004	763
			2005	815
	ATLD	HAK	1998	829
	MON	DT	1995	550
			1996	744
	VSH	TVL	2002	406
SWE	ARG	FOT	1991	383
			1992	68
			1993	564
			1994	718
			1996	1552
			1997	1351
			1998	1147
			1999	1058
			2000	224
		GOV	1991	117
			1992	407
			1993	519
			1994	625
			1995	1356
			1999	278
			2000	1118
		TVL	1999	53
			2001	1092
			2002	1078
			2003	1051
			2004	1385
			2005	1002

BITS quarter 2				
Country	Ship	Gear	Year	Number
EST	KOOT	TVS	2000	9
GFR	CLP	SON	1996	184
LAT	BPE	LBT	1993	65
		LPT	1993	22
	CLV	LBT	1997	203
			1998	225
			1999	35
		TVS	1999	42
	MONL	DT	1994	311
	ZBA	LBT	1991	68
POL	BAL	P20	1996	156
RUS	ATL	HAK	1997	28
	ATLD	HAK	1998	3
	MON	DT	1993	404
			1994	837

BITS quarter 3				
Country	Ship	Gear	Year	Number
LAT	ZBA	LBT	1991	436
SWE	ARG	FOT	1991	338
			1993	357
			1994	455
		GOV	1992	413
			1993	601
			1995	949

BITS quarter 4				
Country	Ship	Gear	Year	Number
DEN	DAN2	GRT	2000	34
		TVL	1999	867
			2000	1079
			2001	852
			2002	962
			2003	413
			2004	2808
	HAF	TVS	1999	538
			2000	378
			2001	193
			2002	225
EST	KOOT	TVS	2000	41
GFR	SOL	H20	1991	346
			1992	1171
			1993	1189
			1994	1048
			1995	711
			1996	833
			1997	750
			1998	816
			1999	1003
			2000	1040
		SON	1993	125
			1994	226
			1995	71
			1996	128
			1997	212
			1998	397
		TVS	2001	1056
			2002	906
			2003	1194

			2004	1213
LAT	CLV	LBT	1997	369
			1999	180
			2000	385
		TVS	1999	56
			2000	104
			2001	406
			2002	139
			2003	408
			2004	453
LTU	DAR	TVS	2004	181
POL	BAL	TVL	2002	285
			2003	388
			2004	470
			2005	522
SWE	ARG	FOT	1991	378
			1993	438
			1994	1123
			1995	1578
			1996	1063
			1997	1306
			1998	1202
			1999	455
		GOV	1993	573
			1996	174
			1999	776
			2000	1222
		TVL	2001	878
			2002	877
			2003	950
			2004	686

C. Number of age records for herring in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
DEN	DAN2	TVL	2001	577
GFR	SOL	H20	1991	381
			1992	365
			1993	335
			1994	656
			1995	408
			1996	591
			1997	234
			1998	733
			1999	506
			2000	301
LTU	DAR	TVS	2005	325
POL	BAL	P20	1994	468
			1995	1133
			1996	839
			1997	1175
			1998	602
			1999	958
			2000	837
		TVL	1999	169
			2000	145
	GDY	P20	1991	330
			1992	190
			1993	836
RUS	ATL	HAK	1997	402
			1999	634
			2000	894
		TVL	2001	1518
			2005	1562
	ATLD	HAK	1998	938
	MON	DT	1995	741

BITS quarter 2				
Country	Ship	Gear	Year	Number
EST	KOH	ESB	1996	406
POL	BAL	P20	1996	282
RUS	ATLD	HAK	1998	100
	MON	DT	1993	786
			1994	276

BITS quarter 3				
Country	Ship	Gear	Year	Number
EST	KOH	ESB	1995	51
			1996	1405

BITS quarter 4				
Country	Ship	Gear	Year	Number
DEN	DAN2	GRT	2000	45
		TVL	2000	619
			2001	569
			2002	648
			2004	531
EST	KOH	ESB	1996	253
GFR	SOL	H20	1991	458
			1992	452
			1993	285
			1994	322
			1995	484
			1996	514
			1997	541
			1998	894
			1999	589
			2000	578

LTU	DAR	TVS	2004	192
SWE	ARG	FOT	1991	1622

D. Number of age records for sprat in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
DEN	DAN2	TVL	2001	36
GFR	SOL	H20	1991	200
			1992	114
			1993	60
			1994	321
			1995	629
			1996	534
			1997	109
			1998	525
			1999	397
			2000	423
LTU	DAR	TVS	2005	256
POL	BAL	P20	1994	501
			1995	295
			1996	100
			1997	402
			1998	475
			1999	349
			2000	323
		TVL	1999	161
			2000	51
	GDY	P20	1991	508
			1992	243
			1993	517
RUS	ATL	HAK	1999	489

BITS quarter 2				
Country	Ship	Gear	Year	Number
EST	KOH	ESB	1995	121
POL	BAL	P20	1996	85
RUS	MON	DT	1994	155

BITS quarter 4				
Country	Ship	Gear	Year	Number
DEN	DAN2	TVL	2002	298
			2004	211
GFR	SOL	H20	1991	139
			1992	223
			1993	126
			1994	394
			1995	291
			1996	210
			1997	569
			1998	368
			1999	526
			2000	492
		SON	1991	32

E. Number of age records for brill in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
GFR	SOL	H20	1995	7
		SON	1994	1

F. Number of age records for dab in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
GFR	CLP	SON	1994	223
			1995	149
			1998	150
	SOL	TVS	2004	275

BITS quarter 2				
Country	Ship	Gear	Year	Number
GFR	CLP	SON	1996	100

BITS quarter 4				
Country	Ship	Gear	Year	Total
GFR	SOL	H20	1994	362
			1995	68
			1996	323
			1997	49
			1998	28
			2000	190
		SON	1995	256
			1996	117
			1997	177
			1998	239

G. Number of age records for flounder in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
GFR	CLP	SON	1993	25
	SOL	H20	1992	312
			1993	456
			1994	755
			1995	997
			1996	743

			1997	378
			1998	950
			1999	900
			2000	881
		SON	1994	28
		TVS	2001	547
			2002	925
			2003	540
			2004	467
			2005	554
LAT	BPE	LBT	1993	377
	CLV	LBT	1999	250
			2000	248
		TVS	1999	24
			2000	99
			2001	157
			2005	155
	MONL	DT	1995	332
			1996	307
LTU	DAR	TVS	2005	75
POL	BAL	P20	1994	201
			1995	397
			1996	163
			1997	290
			1998	321
			1999	261
			2000	399
		TVL	1999	49
			2000	113
			2001	158
			2002	118
			2003	242
			2004	199
			2005	209
	GDY	P20	1991	223
			1992	78
			1993	145
RUS	ATL	HAK	1997	790
			1999	915
			2000	841
		TVL	2001	1236
			2003	1003
			2005	1012
	ATLD	HAK	1998	661
	MON	DT	1995	752
			1996	883
	VSH	TVL	2002	860

BITS quarter 2				
Country	Ship	Gear	Year	Number
EST	KOOT	TVS	2000	220
LAT	BPE	LBT	1993	95
	CLV	LBT	1997	154
			1998	286
			1999	147
		TVS	1999	73
	MONL	DT	1994	292
POL	BAL	P20	1996	59
RUS	ATLD	HAK	1998	184
	MON	DT	1993	125
			1994	148

BITS quarter 4				
Country	Ship	Gear	Year	Number
DEN	DAN2	GRT	2000	7
		TVL	2000	396
EST	KOOT	TVS	2000	473
GFR	SOL	H20	1991	354
			1992	358
			1993	283
			1994	443
			1995	445
			1996	500
			1997	490
			1998	471
			1999	378
			2000	317
		TVS	2001	653
			2002	627
			2003	508
			2004	538
LAT	CLV	LBT	1997	159
			1999	140
			2000	199
		TVS	2000	149
LTU	DAR	TVS	2004	119
POL	BAL	TVL	2002	113
			2003	176
			2004	187
			2005	225

H. Number of age records for plaice in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
DEN	HAF	TVS	2000	397
			2001	482
			2002	506
GFR	SOL	H20	1994	293

			1995	375
			1996	273
			1997	168
			1998	187
		SON	1994	4
		TVS	2001	246
			2002	157
			2003	272
			2004	190
RUS	ATL	TVL	2001	1
			2005	5

BITS quarter 4				
Country	Ship	Gear	Year	Number
DEN	HAF	TVS	1999	421
			2000	490
			2001	381
			2002	467
GFR	SOL	H20	1994	298
			1995	239
			1996	297
			1997	174
			1998	168
			1999	196
			2000	155
		TVS	2001	50
			2002	209
			2003	310
			2004	326

I. Number of age records for sole in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
DEN	HAF	TVS	2001	10
			2002	30

BITS quarter 4				
Country	Ship	Gear	Year	Number
DEN	HAF	TVS	1999	51
			2001	36
			2002	2

J. Number of age records for turbot in DATRAS

BITS quarter 1				
Country	Ship	Gear	Year	Number
GFR	SOL	H20	1994	161
			1995	182
			1996	80
			1997	59
			1998	99
		SON	1994	1
		TVS	2001	58
			2002	59
			2003	41
			2004	66
			2005	48
LAT	CLV	TVS	2005	17
RUS	ATL	HAK	2000	9
		TVL	2001	29
	MON	DT	1996	69

BITS quarter 4				
Country	Ship	Gear	Year	Number
GFR	SOL	H20	1992	61
			1994	146
			1995	131
			1996	196
			1997	199
			1998	117
			1999	70
			2000	82
		SON	1996	7
			1997	1
		TVS	2001	49
			2002	162
			2003	99
			2004	130

Annex 6: Existing national data and available information

Danish HL and CA data by species (cod, sprat, herring, flounder and other flatfishes), Subdivision and sampling type, data quality assurance and date of submission to DATRAS or expected update.

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA ONLY		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Denmark	SD 21, 22, 23	BITS quarter 1, Trawl survey	1 Cod	X	X	A / M / W	1996–2005	Yes	Yes	1.3.06
Denmark	SD 24	BITS quarter 1, Trawl survey	1 Cod	X	X	age	1982–1994	Yes	Yes	1.3.06
Denmark	SD 24	BITS quarter 1, Trawl survey	1 Cod	X	X	A / M / W	1995–2005	Partly	Yes	1.3.06
Denmark	SD 25, 26, 28	BITS quarter 1, Trawl survey	1 Cod	X	X	age	1982–1994	Yes	Yes	1.3.06
Denmark	SD 25, 26, 28	BITS quarter 1, Trawl survey	1 Cod	X	X	A / M / W	1995–2005	Partly	Yes	1.3.06
Denmark	SD 21, 22, 23	BITS quarter 4, Trawl survey	1 Cod	X	X	A / M / W	1996–2005	Yes	Yes	1.3.06
Denmark	SD 25, 26, 28	BITS quarter 4, Trawl survey	1 Cod	X	X	A / M / W	1998–2005	Partly	Yes	1.3.06
Denmark	SD 25, 26, 28	BITS quarter 1	2 Herring	X	X	age, weight, maturity	1984–2005	Yes	Yes	
Denmark	SD 25, 26, 28	BITS quarter 4	2 Herring	X	X	age, weight, maturity	1999–2005	Yes	Yes	
Denmark	SD 21, 22, 24–29	Commercial sampling	2 Herring	X	X	age, weight, maturity	1980–2005			
Denmark	SD 25, 26, 28	BITS quarter 1	2 Sprat	X	X	age, weight, maturity	1984–2005	Yes	Yes	
Denmark	SD 25, 26, 28	BITS quarter 4	2 Sprat	X	X	age, weight, maturity	1999–2005	Yes	Yes	

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA ONLY		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Denmark	SD 21, 22, 24–29	Commercial sampling	2 Sprat	X	X	age, weight	1980–2000			
Denmark	SD 21, 22, 24–29	Commercial sampling	2 Sprat	X	X	age, weight, maturity	2000–2005			
Denmark	SD 25	BITS quarter 1, Trawl survey	3 Flounder	X			1982–2006	Yes	Yes	1.3.06
Denmark	SD 25	BITS quarter 1, Trawl survey	3 Flounder		X	A / M	1998–2005	No	Yes	1.3.06
Denmark	SD 21, 22, 23	BITS quarter 1, Trawl survey	4 Sole	X	X	A / W	1996–2005	Yes	Yes	1.3.06
Denmark	SD 21, 22, 23	BITS quarter 1, Trawl survey/commercial sampling	4 Sole	X	X	A / W	2004–2005	Yes	Yes	1.3.06
Denmark	SD 21, 22, 23	commercial sampling	4 Sole	X	X	A / W / M	1990–2005			

Estonian HL and CA data by species (cod, sprat, herring, flounder and other flatfishes), Subdivision and sampling type, data quality assurance and date of submission to DATRAS or expected update.

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Estonia	SD 28	BITS quarter 4	1 Cod	X	X	A / M / W	2005–	No	No	15.3.06
Estonia	SD 29	BITS quarter 4	1 Cod	X	X	A / M / W	2005–	No	No	15.3.06
Estonia	SD 28	AC quarter 4	2 Herring	X	X	A / M / W	2001–2005			

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Estonia	SD 29	AC quarter 4	2 Herring	X	X	A / M / W	2001–2005			
Estonia	SD 28	AC quarter 4	2 Sprat	X	X	A / M / W	2001–2005			
Estonia	SD 28	BITS quarter 4	3 Flounder	X	X	A / M / W	2005–	No	No	15.3.06
Estonia	SD 29	BITS quarter 4	3 Flounder	X	X	A / M / W	2005–	No	No	15.3.06

German HL and CA data by species (cod, sprat, herring, flounder and other flatfishes), Subdivision and sampling type, data quality assurance and date of submission to DATRAS or expected update.

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA ONLY (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Germany	SD 22	BITS quarter 1	1 Cod	Y	Y	A / M / W	1981–2005	Yes	1991– 2005	81 – 90 91 – 05
Germany	SD 24	BITS quarter 1	1 Cod	Y	Y	A / M / W	1981–2005	Yes	1991– 2005	81 – 90 91 – 05
Germany	SD 25	BITS quarter 1	1 Cod	Y	Y	A / M / W	1981–2001	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 22	BITS quarter 4	1 Cod	Y	Y	A / M / W	1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 24	BITS quarter 4	1 Cod	Y	Y	A / M / W	1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 25	BITS quarter 4	1 Cod	Y	Y	A / M / W	1978–2001	Yes	1991–2005	81 – 90 91 – 04

Country	Sub-division	Sampling time and type (trawl/acoustic survey, commercial sampling)	Species	Record type		CA data (age/ maturity/ weight)	Year range	Survey data only (yes, no or date)		
				HL	CA			In DATRAS presently	Checked years	Update / submitted
Germany	SD 22, 24, 25	Commercial samples	1 Cod	Y	Y	A / M / W	1992–2005	No	No	
Germany	SD 22	BITS quarter 1	2 Herring	Y	Y	A / M / W	1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 24	BITS quarter 1	2 Herring	Y	Y	A / M / W	1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 25	BITS quarter 1	2 Herring	Y	Y	A / M / W	1981–2001	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 22	BITS quarter 4	2 Herring	Y	Y	A / M / W	1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 24	BITS quarter 4	2 Herring	Y	Y	A / M / W	1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 25	BITS quarter 4	2 Herring	Y	Y	A / M / W	1978–2001	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 22, 24	Commercial samples	2 Herring	Y	Y	A / M / W	1992–2005	No	No	
Germany	SD 22	BITS quarter 1	2 Sprat	Y	Y	A / M / W	198–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 24	BITS quarter 1	2 Sprat	Y	Y	A / M / W	1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 25	BITS quarter 1	2 Sprat	Y	Y	A / M / W	1981–2001	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 22	BITS quarter 4	2 Sprat	Y	Y	A / M / W	1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 24	BITS quarter 4	2 Sprat	Y	Y	A / M / W	1978–2005	Yes	1991–2005	81 – 90 91 – 04

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA ONLY (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Germany	SD 25	BITS quarter 4	2 Sprat	Y	Y	A / M / W	1978–2001	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 22	BITS quarter 1	3 Flounder	Y	Y	A / M / W	1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 24	BITS quarter 1	3 Flounder	Y	Y	A / M / W	1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 25	BITS quarter 1	3 Flounder	Y	Y	A / M / W	1981–2001	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 22	BITS quarter 4	3 Flounder	Y	Y	A / M / W	1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 25	BITS quarter 4	3 Flounder	Y	Y	A / M / W	1978–2001	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 24	BITS quarter 41	3 Flounder	Y	Y	A / M / W	1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 22, 24	Commercial samples	3 Flounder	Y	Y	A / M / W	1992–2005	No	No	
Germany	SD 22	BITS quarter 1	4 Brill	Y	N		1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 24	BITS quarter 1	4 Brill	Y	N		1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 25	BITS quarter 1	4 Brill	Y	N		1981–2001	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 22	BITS quarter 4	4 Brill	Y	N		1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 24	BITS quarter 4	4 Brill	Y	N		1978–2005	Yes	1991–2005	81 – 90 91 – 04

Country	Sub-division	Sampling time and type (trawl/acoustic survey, commercial sampling)	Species	Record type		CA data (age/ maturity/ weight)	Year range	Survey data only (yes, no or date)		
				HL	CA			In DATRAS presently	Checked years	Update / submitted
Germany	SD 25	BITS quarter 4	4 Brill	Y	N		1978–2001	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 22	BITS quarter 1	4 Plaice	Y	N		1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 24	BITS quarter 1	4 Plaice	Y	N		1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 25	BITS quarter 1	4 Plaice	Y	N		1981–2001	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 22	BITS quarter 4	4 Plaice	Y	N		1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 24	BITS quarter 4	4 Plaice	Y	N		1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 25	BITS quarter 4	4 Plaice	Y	N		1978–2001	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 22	BITS quarter 1	4 Sole	Y	N		1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 24	BITS quarter 1	4 Sole	Y	N		1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 25	BITS quarter 1	4 Sole	Y	N		1981–2001	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 22	BITS quarter 4	4 Sole	Y	N		1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 24	BITS quarter 4	4 Sole	Y	N		1978–2005	Yes	1991–2005	81 – 90 91 – 04

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA ONLY (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Germany	SD 25	BITS quarter 4	4 Sole	Y	N		1978–2001	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 22	BITS quarter 1	4 Turbot	Y	N		1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 24	BITS quarter 1	4 Turbot	Y	N		1981–2005	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 25	BITS quarter 1	4 Turbot	Y	N		1981–2001	Yes	1991–2005	81 – 90 91 – 05
Germany	SD 22	BITS quarter 4	4 Turbot	Y	N		1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 24	BITS quarter 4	4 Turbot	Y	N		1978–2005	Yes	1991–2005	81 – 90 91 – 04
Germany	SD 25	BITS quarter 4	4 Turbot	Y	N		1978–2001	Yes	1991–2005	81 – 90 91 – 04

German age, weight and maturity data are available for plaice, turbot, brill and sole in survey protocols for some years. It will be checked whether these data can be made available to the DATRAS database.

Latvian HL and CA data by species (cod, sprat, herring, flounder and other flatfishes), Subdivision and sampling type, data quality assurance and date of submission to DATRAS or expected update.

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Latvia	SD 25	BITS survey quarter 1	1 Cod	X			1991	Yes	Yes	

Country	Sub-division	Sampling time and type (trawl/acoustic survey, commercial sampling)	Species	Record type		CA data (age/ maturity/ weight)	Year range	Survey data (yes, no or date)		
				HL	CA			In DATRAS presently	Checked years	Update / submitted
Latvia	SD 26–28	BITS survey quarter 1	1 Cod	X	X		1991, 1993, 1995, 1996 1999–2005	Yes	Yes	
Latvia	SD 26–28	BITS survey quarter 2	1 Cod	X	X		1991, 1993, 1994, 1997–1999	Yes	Yes	
Latvia	SD 26–28	Trawl survey quarter 3	1 Cod	X			1991	Yes	Yes	
Latvia	SD 26–28	BITS survey quarter 4	1 Cod	X	X		1997, 1999–2005	Yes	Yes	
Latvia	SD 25	BITS survey quarter 1	3 Flounder	X			1991	Yes	No	???
Latvia	SD 26–28	BITS survey quarter 1	3 Flounder	X	X		1993, 1995, 1996, 1999–2001, 2005	Yes	No	???
Latvia	SD 26–28	BITS survey quarter 1	3 Flounder	X			1991, 2002–2004	Yes	No	???
Latvia	SD 26–28	BITS survey quarter 2	3 Flounder	X	X		1993, 1994, 1997–1999	Yes	No	???
Latvia	SD 26–28	BITS survey quarter 2	3 Flounder	X			1991	Yes	No	???
Latvia	SD 26–28	Trawl survey quarter 3	3 Flounder	X			1991	Yes	No	???
Latvia	SD 26–28	BITS survey quarter 4	3 Flounder	X	X		1997, 1999, 2000, 2005	Yes	No	???
Latvia	SD 26–28	BITS survey quarter 4	3 Flounder	X			2001–2004	Yes	No	???

Lithuanian HL and CA data by species (cod, sprat, herring, flounder and other flatfishes), Subdivision and sampling type, data quality assurance and date of submission to DATRAS or expected update.

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Lithuania	26	BITS 1 Q	1 Cod	X	X	A / M / W	2005	yes	no	06.03.20
Lithuania	26	BITS 4 Q	1 Cod	X	X	A / M / W	2004–2005	2004 yes	no	06.03.20
Lithuania	26	Commercial 4 Q	1 Cod	X	X	Age	2005	No	no	
Lithuania	26	Acoustic 1 Q	2 Herring	X	X	A / M / W	2005	Not sure	no	06.03.20
Lithuania	26	Acoustic 4 Q	2 Herring	X	X	A / M / W	2005	Not sure	no	06.03.20
Lithuania	26	BITS 1 Q	2 Herring	X	X	A / M / W	2005	yes	No	06.03.20
Lithuania	26	BITS 4 Q	2 Herring	X	X	A / M / W	2004–2005	2004 yes	No	06.03.20
Lithuania	26	Commercial 4 Q	2 Herring	X	X	Age	2005	No	no	
Lithuania	26	Acoustic 1 Q	2 Sprat	X	X	A / M / W	2005	Not sure	no	06.03.20
Lithuania	26	Acoustic 4 Q	2 Sprat	X	X	A / M / W	2005	Not sure	no	06.03.20
Lithuania	26	BITS 1 Q	2 Sprat	X	X	A / M / W	2005	yes	No	06.03.20

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Lithuania	26	BITS 4 Q	2 Sprat	X	X	A / M / W	2004–2005	2004 yes	No	06.03.20
Lithuania	26	Commercial 4 Q	2 Sprat	X	X	Age	2005	No	no	
Lithuania	26	BITS 1 Q	3 Flounder	X	X	A / M / W	2005	yes	no	06.03.20
Lithuania	26	BITS 4 Q	3 Flounder	X	X	A / M / W	2004–2005	2004 yes	no	06.03.20
Lithuania	26	Commercial 4 Q	3 Flounder	X	X	Age	2005	No	no	

Polish HL and CA data by species (cod, sprat, herring, flounder and other flatfishes), Subdivision and sampling type, data quality assurance and date of submission to DATRAS or expected update.

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Poland	SD 25 & 26	BITS quarter 1	1 Cod	X	X	A / M / W	2000, 2005–2006	Yes	Partly	15.03.06
Poland	SD 25 & 26	BITS quarter 1	1 Cod	X	X	A / M / W	2001	Yes	Yes	03.02.06
Poland	SD 25 & 26	BITS quarter 1	1 Cod	X	X	A / M / W	1991–1999	Yes	No	01.12.06
Poland	SD 25 & 26	BITS quarter 1 & 4	1 Cod	X	X	A / M / W	2002– 2004	Yes	Yes	03.02.06
Poland	SD 25 & 26	commercial sampling most of the year with some years missing	1 Cod	X	X	A / M / W	Mid 1980's-present			

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Poland	SD 25 & 26	BITS quarter 1	2 Herring	X	X	A / M / W	1991–2000	Yes	No	
Poland	SD 25 & 26	BITS quarter 1 & 4	2 Herring	X	X	A / M / W	2002–2005	No	No	
Poland	SD 25 & 26	commercial sampling almost all months	2 Herring	X	X	A / M / W	1990–2005			
Poland	SD 25 & 26	BITS quarter 1	2 Sprat	X	X	A / M / W	1991–2000	Yes	No	
Poland	SD 25 & 26	BITS quarter 1 & 4	2 Sprat	X	X	A / M / W	2002–2005	No	No	
Poland	SD 25 & 26	commercial sampling almost all months	2 Sprat	X	X	A / M / W	1990–2005			
Poland	SD 25 & 26	BITS quarter 1	3 Flounder	X	X	A / M / W	1991–2001	Yes	No	01.06.07
Poland	SD 25 & 26	BITS quarter 1 & 4	3 flounder	X	X	A / M / W	2005–2006	Yes	No	15.03.06
Poland	SD 25 & 26	BITS quarter 1 & 4	3 Flounder	X	X	A / M / W	2002–2004	Yes	No	01.12.06
Poland	SD 25 & 26	commercial sampling all months except Feb-June	3 Flounder	X	X	A / M / W	Early 1990's - 2005			

Russian HL and CA data by species (cod, sprat, herring, flounder and other flatfishes), Subdivision and sampling type, data quality assurance and date of submission to DATRAS or expected update.

COUNTRY	SUBDIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Russia	SD 26	BITS quarter 1	1 Cod	X	X	A / M / W	1993–1994	No	No	1.7.06
Russia	SD 26	BITS quarter 1	1 Cod	X	X	A / M / W	1995–2005	Yes	Partly	1.7.06
Russia	SD 26	BITS quarter 4	1 Cod	X	X	A / M / W	2003–2005	No	No	20.3.06
Russia	SD 26	BITS quarter 1	2 Herring	X	X	A / M / W	1993–1994	No	No	1.7.06
Russia	SD 26	BITS quarter 1	2 Herring	X	X	A / M / W	1995–2005	Yes	Partly	1.7.06
Russia	SD 26	BITS quarter 4	2 Herring	X	X	A / M / W	2003–2005	No	No	20.3.06
Russia	SD 26	BITS quarter 1	2 Sprat	X	X	A / M / W	1993–1994	No	No	1.8.06
Russia	SD 26	BITS quarter 1	2 Sprat	X	X	A / M / W	1995–2005	No	No	1.8.06
Russia	SD 26	BITS quarter 4	2 Sprat	X	X	A / M / W	2003–2005	No	No	20.3.06
Russia	SD 26	BITS quarter 1	3 Flounder	X	X	A / M / W	1995–2005	Yes	Partly	1.7.06
Russia	SD 26	BITS quarter 4	3 Flounder	X	X	A / M / W	2003–2005	No	No	20.3.06
Russia	SD 26	BITS quarter 1	3 Flounder	X	X	A / M / W	1993–1994	No	No	1.7.06

Swedish HL and CA data by species (cod, sprat, herring, flounder and other flatfishes), Subdivision and sampling type, data quality assurance and date of submission to DATRAS or expected update.

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA ONLY (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Sweden	SD 23	BITS quarter 1	1 Cod	X			1992–1995, 2004	yes?	no	01.3.07
Sweden	SD 23	BITS quarter 1	1 Cod		X	A / M / W	1992–1993, 2004	yes?	no	01.3.07
Sweden	SD 23	BITS quarter 3	1 Cod	X			1992, 1995	yes?	no	01.3.07
Sweden	SD 23	BITS quarter 3	1 Cod		X	A / M / W	1992	yes?	no	01.3.07
Sweden	SD 23	BITS quarter 4	1 Cod	X	X	A / M / W	1993–1996	yes?	no	01.3.07
Sweden	SD 24	BITS quarter 1	1 Cod	X	X	A / M / W	1991–2000	yes	yes	01.3.07
Sweden	SD 25	BITS quarter 1	1 Cod	X	X	A / M / W	1991– 2005*	yes	yes	31.3.06
Sweden	SD 26	BITS quarter 1	1 Cod	X	X	A / M / W	1991–2005*	yes	yes	
Sweden	SD 27	BITS quarter 1	1 Cod	X	X	A / M / W	1991–2005*	yes	yes	
Sweden	SD 28	BITS quarter 1	1 Cod	X	X	A / M / W	1991–2005*	yes	yes	
Sweden	SD 24	BITS quarter 3	1 Cod	X	X	A / M / W	1991–1993* 1995	?	no	01.3.07
Sweden	SD 25	BITS quarter 3	1 Cod	X	X	A / M / W	1991–1995*	no?	no	01.3.07

Country	Sub-division	Sampling time and type (trawl/acoustic survey, commercial sampling)	Species	Record type		CA data (age/ maturity/ weight)	Year range	Survey data only (yes, no or date)		
				HL	CA			In DATRAS presently	Checked years	Update / submitted
Sweden	SD 26	BITS quarter 3	1 Cod	X	X	A / M / W	1992,1993, 1995	no?	no	01.3.07
Sweden	SD 27	BITS quarter 3	1 Cod	X	X	A / M / W	1991–1995*	no?	no	01.3.07
Sweden	SD 28	BITS quarter 3	1 Cod	X	X	A / M / W	1991–1993*, 1995	no?	no	01.3.07
Sweden	SD 24	BITS quarter 4	1 Cod	X	X	A / M / W	1991,1993–2000**	yes	yes	31.3.06
Sweden	SD 25	BITS quarter 4	1 Cod	X	X	A / M / W	1991, 1993– 2005*	Yes	yes	
Sweden	SD 26	BITS quarter 4	1 Cod		X	A / M / W	1991,1994 – 2000, 2003	Yes	yes	
Sweden	SD 26	BITS quarter 4	1 Cod	X		A / M / W	1991, 1994–2000, 2003, 2004			
Sweden	SD 27	BITS quarter 4	1 Cod	X	X	A / M / W	1991, 1993–2005*	Yes	yes	
Sweden	SD 28	BITS quarter 4	1 Cod	X	X	A / M / W	1991, 1993–2005*	Yes	yes	
Sweden	SD 24, 25–28	Commercial	1 Cod			Age, weight	1992–2005			
Sweden	SD 21	IBTS quarter 1 and 3	1 Cod	X	X	A / M / W	1991?–2005	yes	no	31.3.06
Sweden	SD 23	IBTS quarter 1and 3	1 Cod	X	X	A / M / W	1991–2005?????	partly	no	01.3.07

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA ONLY (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Sweden	SD25–29S	BIAS quarter 4	2 Herring	X	X	A / M / mean W	1986–2005****			
Sweden	SD 23	BITS quarter 1	2 Herring	X			1992–1995 2004	yes		
Sweden	SD 24	BITS quarter 1	2 Herring	X			1991–2000	yes		
Sweden	SD 25–28	BITS quarter 1	2 Herring	X			1991–2005	yes		
Sweden	SD 23	BITS quarter 3	2 Herring	X			1992,1995	yes		
Sweden	SD 24	BITS quarter 3	2 Herring	X			1991–1993, 1995	Yes		
Sweden	SD 25–28***	BITS quarter 3	2 Herring	X			1991–1995	Yes		
Sweden	SD 23	BITS quarter 4	2 Herring	X			1993–1996	Yes		
Sweden	SD 24	BITS quarter 4	2 Herring	X			1991, 1993–2000	yes		
Sweden	SD 25–28***	BITS quarter 4	2 Herring	X			1991–2005	yes		
Sweden	SD 24 – 31	Commercial	2 Herring	X	X	A / M / W	1970?–2005			

Country	Sub-division	Sampling time and type (trawl/acoustic survey, commercial sampling)	Species	Record type		CA data (age/ maturity/ weight)	Year range	Survey data only (yes, no or date)		
				HL	CA			In DATRAS presently	Checked years	Update / submitted
Sweden	SD 25–29S	BIAS quarter 4	2 Sprat	X	X	A / M / W	1986–2005****			
Sweden	SD 23	BITS quarter 1	2 Sprat	X			1992–1995, 2004	yes		
Sweden	SD 24	BITS quarter 1	2 Sprat	X			1991–2000	yes		
Sweden	SD 25–28***	BITS quarter 1	2 Sprat	X			1991–2005	yes		
Sweden	SD 23	BITS quarter 3	2 Sprat	X			1992,1995	yes		
Sweden	SD 24	BITS quarter 3	2 Sprat	X			1991–1993, 1995	yes		
Sweden	SD 25,27	BITS quarter 3	2 Sprat	X			1991–1995	yes		
Sweden	SD 26, 28***	BITS quarter 3	2 Sprat	X			1991–1993, 1995	yes		
Sweden	SD 23	BITS quarter 4	2 Sprat	X			1993–1996	yes		
Sweden	SD 24	BITS quarter 4	2 Sprat	X			1991, 1992–2000	yes		
Sweden	SD 25,27	BITS quarter 4	2 Sprat	X			1991 1993–2005	yes		

COUNTRY	SUB-DIVISION	SAMPLING TIME AND TYPE (TRAWL/ACOUSTIC SURVEY, COMMERCIAL SAMPLING)	SPECIES	RECORD TYPE		CA DATA (AGE/ MATURITY/ WEIGHT)	YEAR RANGE	SURVEY DATA ONLY (YES, NO OR DATE)		
				HL	CA			IN DATRAS PRESENTLY	CHECKED YEARS	UPDATE / SUBMITTED
Sweden	SD 26, 28***	BITS quarter 4	2 Sprat	X			1991, 1993–2001, 2003–2005	yes		
Sweden	SD 23, 24	BITS quarter 1	3 Flounder	X			1991–2005	yes		
Sweden	SD 25–28	BITS quarter 1	3 Flounder	X			1991–2005	yes		
Sweden	SD 23, 24	BITS quarter 3	3 Flounder	X			1991–1995	Yes		
Sweden	SD 25–28	BITS quarter 3	3 Flounder	X			1991–1995	Yes		
Sweden	SD 23, 24	BITS quarter 4	3 Flounder	X			1991–2005	Yes		
Sweden	SD 25–28	BITS quarter 4	3 Flounder	X			1991–2005	yes		
Sweden	SD 25–28	BITS quarter 4	3 Flounder	X			1991–2005	yes		
Sweden	SD 25–28?	Commercial	3 Flounder		X	A / M / W	2004–2005			

***Year1993 – weight, sex and maturity data incomplete**

**** Years 1993 and 1996 – weight, sex and maturity data incomplete**

***** length data from Subdivision 26 is incomplete**

****** no survey performed in 1993 and 1997, 1995 SD 25 sampled only**