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Report of the Baltic International Fish Survey Working Group (WGBIFS)

26–30 March 2012

Helsinki, Finland

ICES International Council for the Exploration of the Sea

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Executive summary

The ICES Baltic International Fish Survey Working Group (WGBIFS) met at rented conference room in the Restaurant Vltava, Helsinki, Finland, from 26–30 March 2012 to compile the survey results from 2011 and first half of 2012 and to coordinate and plan the schedule for surveys in second half of 2012 and first half of 2013. Furthermore, the common survey manuals were updated according to decisions made during the meeting. All fish stock assessment relevant surveys in the Baltic Sea with international participation (both bottom-trawl surveys and acoustic surveys) were coordinated. In total, 22 participants, representing nine countries around the Baltic Sea, attended in the WGBIFS meeting. The group was chaired by Olavi Kaljuste, Sweden.

The results of the survey (BIAS, BASS, BITS) standard data compilation can be found under the relevant sections. Time-series of the acoustic tuning fleets are presented in Annex 5.

The evaluation of the realized trawl and acoustic surveys showed that stock indices based on the surveys present realistic estimates of the current stocks. The discussion of the survey results and the planning of the next surveys clearly showed that it is necessary that the cruise leaders inform the coordinators of the surveys as soon as possible, if planned control-stations cannot be realized or planned areas cannot be covered due to technical failure or weather conditions to offer the opportunity of alternative solutions.

Different methodical aspects of the acoustic surveys were discussed. However, statistical analyses were commonly based on a subset of the data because the database of acoustic source data does not work. The group strongly recommends that ICES realizes necessary further development of FishFrame 5.0. Based on an available database, new methods can be developed and validated to improve the quality of the stock indices based on the acoustic surveys.

A large part of the working time was committed by discussions of additional terms of reference based on recommendations of other expert groups of EU and ICES. All these requests are replied in the current report.

1 Opening of the meeting

The meeting took place from 26 to 30 March 2012 at rented conference room in the Restaurant Vltava, Helsinki, Finland. The meeting was opened by the Chair at 10 am. Mr Jukka Pönni, the organizer of the meeting from the Finnish side informed the participants about the household rules.

The Terms of Reference for the meeting were:

The **Baltic International Fish Survey Working Group** (WGBIFS), chaired by Olavi Kaljuste*, Sweden, will meet in Helsinki, Finland, 26–30 March 2012 to:

a) Combine and analyse the results of spring and autumn 2011 acoustic surveys and experiments and report to WGBFAS;

b) Update the hydroacoustic databases BAD1 and FishFrame;

c) Plan and decide on acoustic surveys and experiments to be conducted in autumn 2012 and spring 2013;

d) Discuss the results from BITS surveys performed in autumn 2011 and spring 2012 and review the upload and development status of DATRAS;

e) Plan and decide on demersal trawl surveys and experiments to be conducted in autumn 2012 and spring 2013;

f) Update and correct the Tow Database;

g) Review and update the Baltic International Trawl Survey (BITS) manual;

h) Review and update the Baltic International Acoustic Survey (BIAS) manual;

i) Review of new results on the vertical distribution of the cod during the BITS;

j) Discuss the indices of acoustic surveys based on different methods for combining the data of fishing stations in compilation of acoustic indices and draft recommendations as appropriate;

k) Evaluate the new uncertainty estimates for the BIAS abundance indices derived from a simulation model and draft recommendations as appropriate;

l) Evaluate the characteristics of TVL and TVS standard gears used in BITS based on the details gear check according to the BITS manual and provide written documentation of findings;

m) Evaluate the BITS data stored in DATRAS for describing biodiversity in the Baltic Sea covers by BITS in spring and autumn and draft recommendations as appropriate;

n) Coordinate stomach sampling programme in the Baltic International Trawl Survey (BITS).

Additional Terms of Reference were added based on the recommendations made by other Experts groups:

- Review and update the structure of the BIAS database to incorporate the estimates of two herring stocks in one subdivision. (Rec. by WGBIFS).
- Evaluate the proportion of WBSS in SD 25 and SD 26 during the BIAS. (Rec. by WGBIFS).
- Discuss the suggested new maturity scales for flatfish. (Outcome of WKMSSPDF2).

- Discuss the suggested increase of the spatial overlap between "Solea" and "Havfisken". (Rec. by WGBFAS).
- Discuss whether a modification of the BITS survey design would give a better sampling of the older age-classes of cod. (Rec. by WGBFAS).
- Discuss how to provide standardized time-series of flounder and plaice from the BITS survey. (Rec. by WGBFAS).
- Discuss the suggested collection and storage of marine litter information in the Baltic International Trawl Survey. (Based on EC's Marine Strategy Framework Directive (MSFD), WKMAL).
- Discuss how to estimate the survey sampling variance. (Rec. by WGMG).

2 Adoption of the agenda and organization of the meeting

The agenda was presented by the Chair (see Annex 2) and was adopted without any changes. To each task one delegate was assigned as "text responsible" and one or more as "assistant text responsible".

Two subgroups were formed; the first one dealing with demersal trawl survey (BITS) issues and the other one dealing with issues related to acoustic surveys (BIAS, BASS). The subgroups were responsible for the discussion of the relevant issues listed in the meeting agenda. The "text responsible" persons were obligated for the preparation of the draft text and the presentations in plenary. Plenary was held whenever needed and before the end of the meeting all responsible persons presented their results in plenary.

3 Combine and analyse the results of spring (BASS) and autumn (BIAS) 2011 acoustic surveys and experiments and report to WGBFAS

3.1 Combined results of the Baltic International Acoustic Survey (BIAS)

In 2011, the following acoustic surveys were conducted between September and November:

Vessel	Country	ICES Subdivisions
Dana	Sweden	25, 26, 27, 28, 29,
Dana	Sweden/Finland	30
Baltica	Poland	Parts of 24, 25 and 26
Baltica	Latvia/Poland	Parts of 26 and 28
Baltica	Estonia/ Finland/ Poland	Parts of 28, 29 and 32
Darius	Lithuania	Part of 26
Solea	Germany/Denmark	21, 22, 23, 24
Atlantniro	Russia	Part of 26

Stock indices of herring and sprat by age-groups of the different cruises are stored in the BIAS database. The standard reports from BIAS 2011 cruise are presented in Annex 8 using the standard format.

3.1.1 Area under investigation and overlapping areas

Each the ICES statistical rectangle of the area under investigation was allocated to one country during the WGBIFS meeting in 2005, thus each country has a mandatory responsible area. That means that area shall be acoustically investigated by about 60 NM and at least two control-hauls. However, it is allowed for all nations to cover also other areas, the results from the responsible country are used if these data are available.

The Figure 3.1.1.1 illustrates that the planned coverage of the Baltic Sea during the acoustic (BIAS) survey in September-October 2011, was realized. The area coverage of the Baltic with the BIAS/2011 survey was the same as required by the WGBIFS 2011.

In 2011, seven statistical rectangles were investigated by more than one country (Figure 3.1.1.1). Differences in the results of these overlapped areas can be explained by the various coverage of different depth ranges and the temporal variability of fish distribution. These differences, however, have no significant effect on the calculation of the tuning fleet indices. Therefore, in the calculation of the indices, the data from the country responsible for specific rectangle was used. However, in cases of three ICES rectangles (38G4, 38G9, and 40G 9) the mean values from two different national-surveys were calculated.

It should be mentioned that in July 2011, the Estonian-Latvian acoustic survey in the Gulf of Riga was accomplished, as was planned during WGBIFS 2011 meeting. The survey results from recent years are accessible at the national level, however, were not uploaded to the WGBIFS BIAS database.

Since autumn 2006, the Baltic International Acoustic Survey is covering the Gulf of Finland (SD 32) only partly, i.e. in the Estonian and Finnish EEZs. The recent BIAS surveys were performed on the Polish RV "BALTICA". The WGBIFS (meeting in

2011) discussed the proposal of Russian delegate from the GosNIORH - St Petersburg, to include the above-mentioned institute as a participant in the BIAS with all obligations originated from the current BIAS manual.

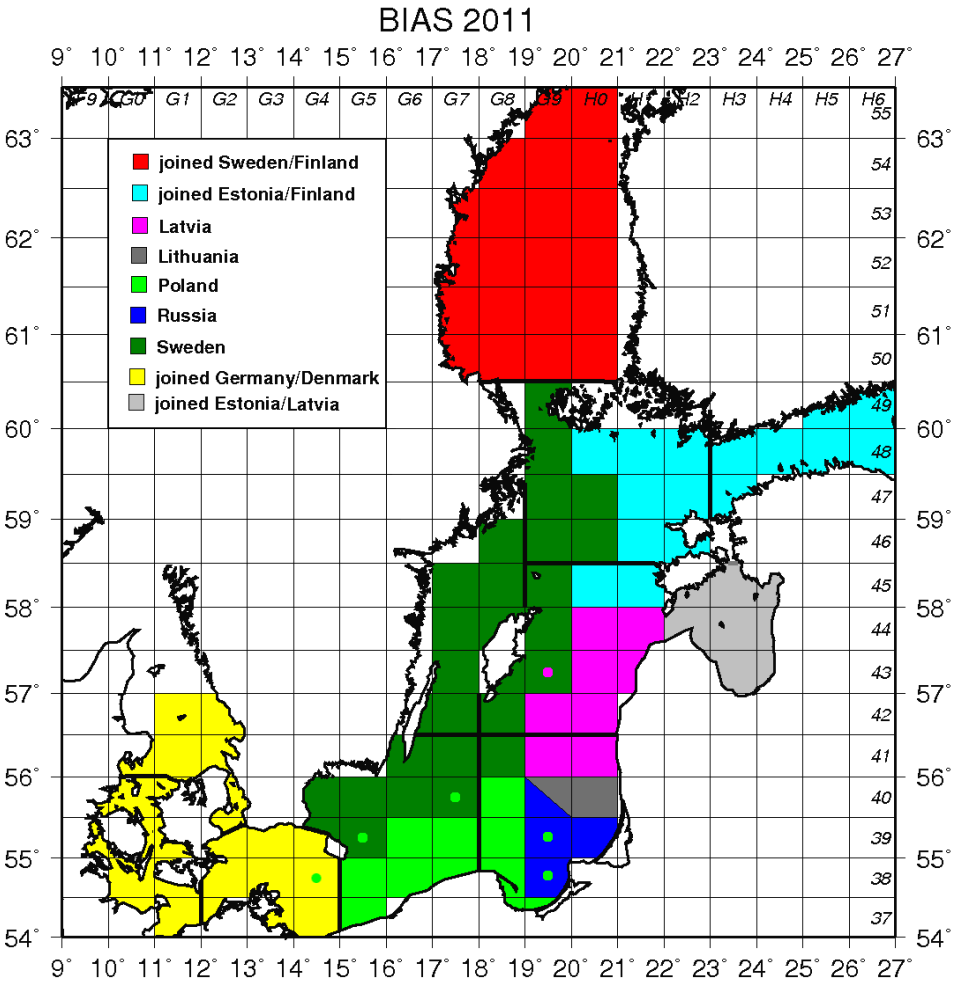


Figure 3.1.1.1. Map of BIAS surveys conducted in September-October 2011. Various colours indicate the countries, which covered specific ICES-rectangles and delivered data to BAD1-database, thus was responsible for this rectangle. Dot with different colour within a rectangle explain additional data in BAD1 partly or totally covered by other countries.

The WGBIFS (meeting in 2012) was informed about the results of the complex ecosystem survey carried out in Russian EEZ (SD 32) by GosNIORH in October 2011. The WGBIFS was informed that due to objective reasons the acoustic measurements were not accomplished during that survey. That did not allow incorporating the Russian 2011 survey data (SD 32) into the BIAS 2011. However, the group considered that the biological data from fish control-catches (species composition, size structure and distribution pattern) are comparable to the respective data from BIAS 2011 in the rest of the Gulf of Finland and can be used in the analysis of biology, distribution and their habitat conditions of pelagic fish in the Gulf of Finland.

The summary of the BIAS and BASS national cruises results from 2011 is presented in the Annex 8.

3.1.2 Total results

The fish abundance estimates, which are based on the BIAS surveys in September-October 2011 are presented per ICES rectangles and fish age groups in Tables 3.1.2.1, 3.1.2.2 and 3.1.2.3 for herring, sprat and cod, respectively. In addition, the abundance estimates for herring and sprat are presented in Tables 3.1.2.4 and 3.1.2.5 per ICES Subdivisions and fish age groups. Geographical distribution of herring, sprat and cod abundance in the Baltic, according to inspected the ICES rectangles is illustrated in Figures 3.1.2.1–3.1.2.3.

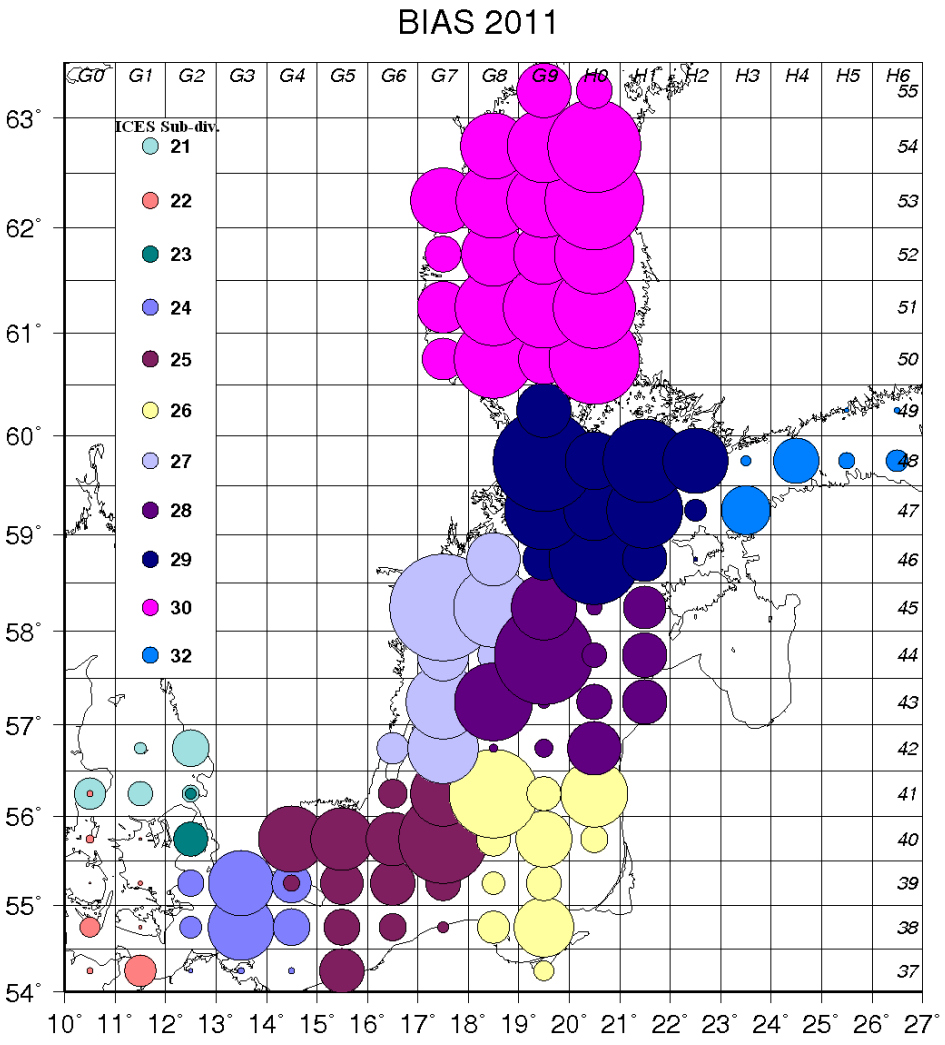


Figure 3.1.2.1. Covered the ICES-rectangles in September/October 2011 with the abundance of herring (the area of the circles indicates the estimate number of herring in 10^6 indiv. in the rectangle, the colour indicates the ICES Subdivision).

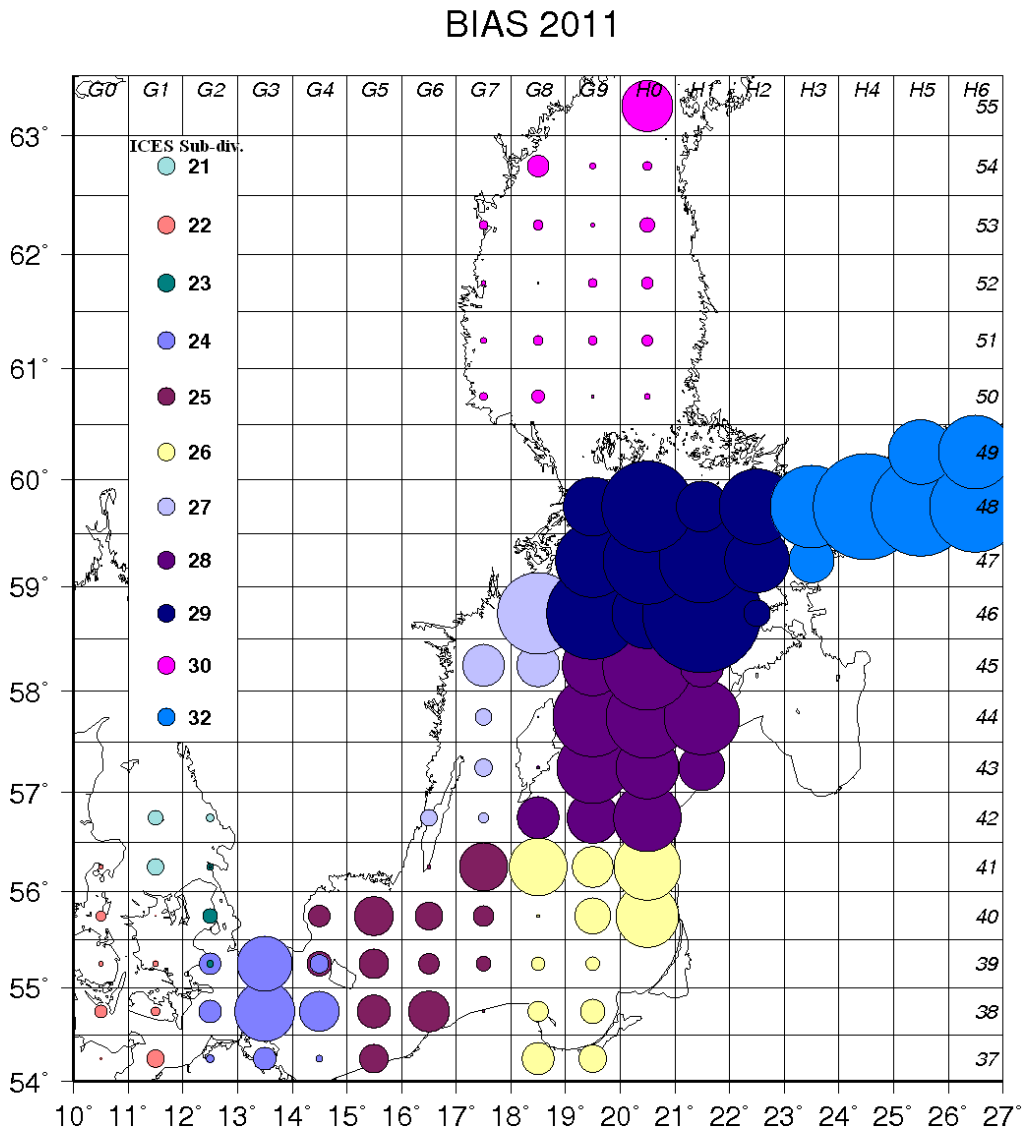


Figure 3.1.2.2. Covered the ICES-rectangles in September/October 2011 with the abundance of sprat (the area of the circles indicates the estimate number of sprat in 10^6 indiv. in the rectangle, the colour indicates the ICES Subdivision).

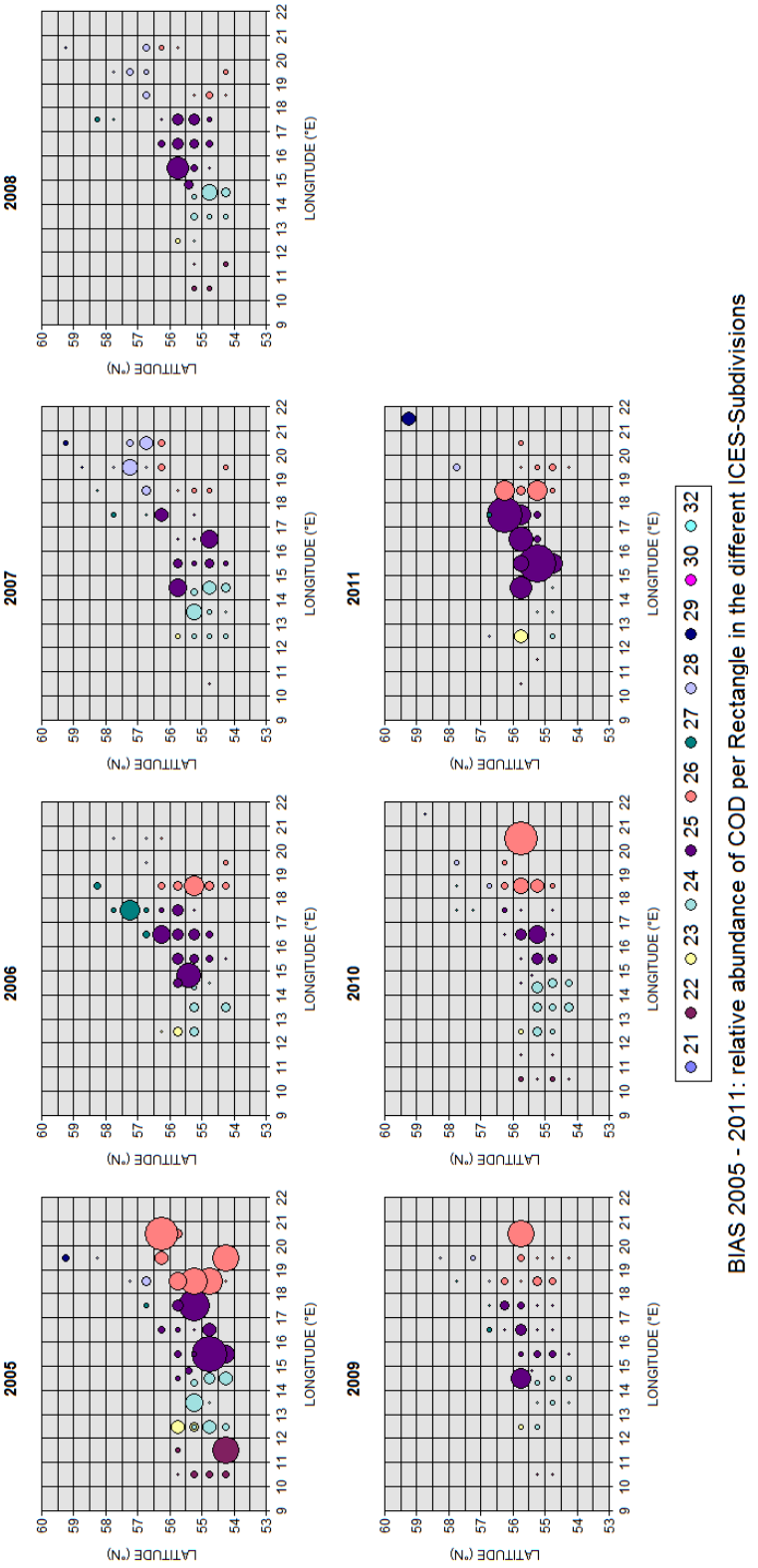


Figure 3.1.2.3. Covered the ICES-rectangles in September/October 2005–2011 with the abundance of cod (the area of the circles indicates the estimate number of cod in 10^6 indiv. in the rectangle, the colour indicates the ICES Subdivision).

3.1.3 Area corrected data

During WGBIFS meeting in 2006 possible improvement of presenting the results from acoustic surveys was discussed, and correction factor for each ICES Subdivision and year was introduced because of the coverage of the investigated area differed in the years. This factor is the proportion between the total area of subdivision that are presented in the BIAS manual (see Table 2.2 in IBAS manual) and the area of rectangles, which was covered during the survey. Some disagreements appeared about the appropriate area of ICES Subdivision 28. It was agreed that the Gulf of Riga must be excluded from the total area of SD 28. All other subdivision kept their areas from the manual (see Section 3.3). The area corrected abundance estimates for herring and sprat per ICES Subdivisions and age groups are summarized in Tables 3.1.3.1 and 3.1.3.2, respectively. Biomass for herring and sprat per ICES Subdivisions and age groups are given in Tables 3.1.3.3 and 3.1.3.4.

3.1.4 Tuning fleets for WGBFAS

3.1.4.1 Herring in the ICES Subdivisions 25–29

Tuning fleet is presented from the September/October 1991–2011 BIAS surveys for the assessment of the Central Baltic herring stock, the area corrected combined results of the ICES Subdivisions 25–29 are presented in Annex 5 (Table 1) and recruitment index for herring (age 0) is presented in Annex 5 (Table 2).

In the years, 1993, 1995 and 1997 the area coverage was very poor. The results were therefore not recommended to be used. It is recommended that these data should also not be used in future.

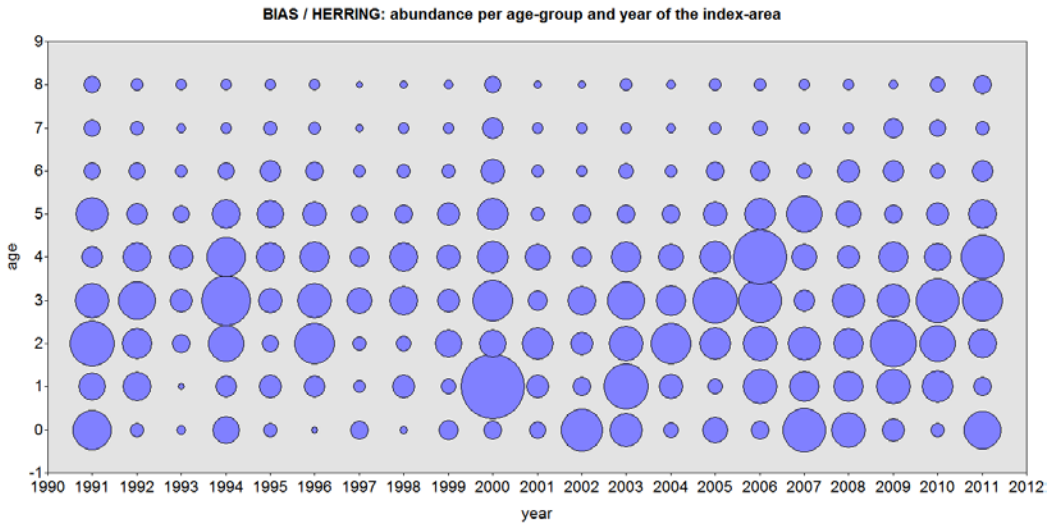


Figure 3.1.4.1.1. Autumn (BIAS) tuning fleet index (abundance per age groups and years) for herring in the ICES Subdivisions 25–29.

In 2000, a large discrepancy between old and new dataset was observed. The high herring abundance values occurred in year 2000 because of the very dense herring concentrations (large numbers) appearance in the northern part of the ICES Subdivision 29. The BIAS surveys have covered this area in years 1991, 2000 and 2005–2011, however, in years 1991, 2005 and 2006 the area coverage of SD 29N was low. Nevertheless, high density of herring has been recorded there always.

In response to WGBFAS recommendation from 2010, the alternative tuning index was calculated with the exclusion of the data from inconsistently covered area of the ICES Subdivision 29N. In the calculations, the data from consistently covered the ICES Subdivision 29S was used instead and extrapolated for whole area of the ICES Subdivision 29. This new tuning fleet, presented in Annex 5 (Table 6), is proposed only for testing in the next benchmark assessment of the Central Baltic herring.

3.1.4.2 Sprat in the ICES Subdivisions 24–29

Tuning fleet is presented from the September/October 1991–2011 BIAS surveys for the sprat assessment of the Central Baltic stock, the area corrected combined results of the ICES Subdivisions 24–29 are presented in Annex 5 (Table 3) and recruitment index for sprat (age 0) in the ICES Subdivisions 26 + 28 is presented in Annex 5 (Table 4). Older data than for 1991 does not exist in the current BIAS database. In the years 1993, 1995 and 1997 the area coverage was very poor. The results were therefore not recommended to be used. It is recommended that these data should also not be used in future.

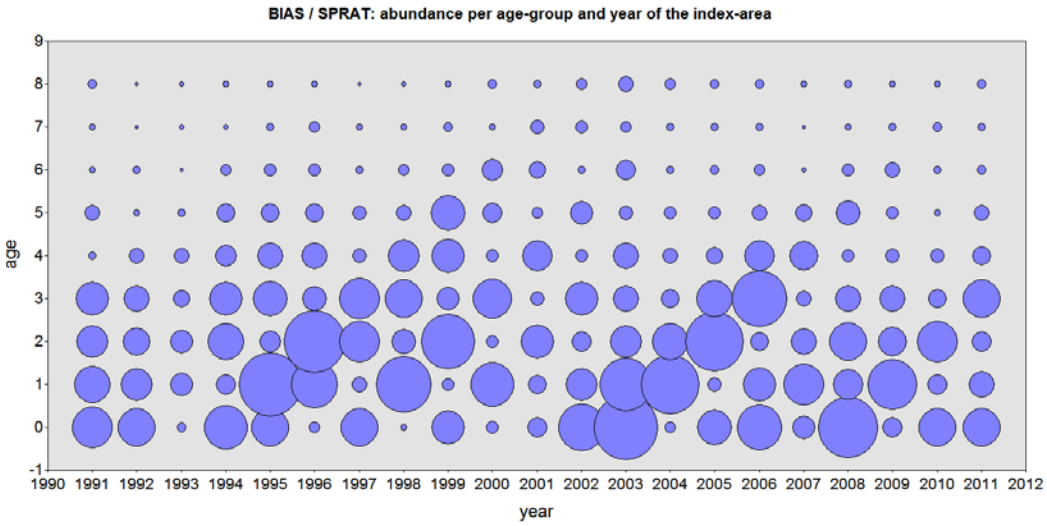


Figure 3.1.4.2.1. Autumn (BIAS) tuning fleet index (abundance per age groups and years) for sprat in the ICES Subdivisions 24–29.

3.1.4.3 Herring in the ICES Subdivision 30

Tuning fleet is presented from the October 1991, 2000; 2007–2011 BIAS surveys for the assessment of the Bothnian Sea (the ICES Subdivision 30) herring stock, the area corrected combined results are presented in Table 3.1.4.3.1. WGBIFS recommends that mentioned data should be used for herring stock assessment.

3.1.5 Recommendations to WGBFAS

i) WGBIFS recommends that, the BIAS-dataset, including the valid data from 2011, can be used in the assessment of the herring and sprat stocks in the Baltic Sea with the restriction that the following years are excluded from the index series: 1993, 1995 and 1997.

ii) The new tuning fleet, presented in Annex 5; Table 6, is proposed for testing in the next benchmark assessment of the Central Baltic herring.

Table 3.1.2.1. Estimated numbers (millions) of herring in September-October 2011, by the ICES rectangles, accordingly to age groups.

SD	RECT	Total	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	41G0	282,96	7,06	272,76	3,14	0,00	0,00	0,00	0,00	0,00	0,00
21	41G1	173,12	11,17	158,54	3,41	0,00	0,00	0,00	0,00	0,00	0,00
21	41G2	86,31	11,67	72,24	2,40	0,00	0,00	0,00	0,00	0,00	0,00
21	42G1	36,95	15,24	20,75	0,96	0,00	0,00	0,00	0,00	0,00	0,00
21	42G2	401,79	334,29	66,51	0,99	0,00	0,00	0,00	0,00	0,00	0,00
22	37G0	11,47	9,63	1,60	0,07	0,17	0,00	0,00	0,00	0,00	0,00
22	37G1	287,72	284,80	2,86	0,06	0,00	0,00	0,00	0,00	0,00	0,00
22	38G0	113,13	101,02	11,43	0,68	0,00	0,00	0,00	0,00	0,00	0,00
22	38G1	3,16	3,10	0,06	0,00	0,00	0,00	0,00	0,00	0,00	0,00
22	39F9	0,15	0,15	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
22	39G0	0,61	0,32	0,28	0,01	0,00	0,00	0,00	0,00	0,00	0,00
22	39G1	4,76	3,65	1,03	0,08	0,00	0,00	0,00	0,00	0,00	0,00
22	40F9	1,39	0,01	1,31	0,06	0,01	0,00	0,00	0,00	0,00	0,00
22	40G0	19,17	0,08	18,21	0,80	0,08	0,00	0,00	0,00	0,00	0,00
22	40G1	2,49	0,18	1,73	0,52	0,06	0,00	0,00	0,00	0,00	0,00
22	41G0	12,30	0,43	11,45	0,40	0,02	0,00	0,00	0,00	0,00	0,00
23	39G2	20,38	10,41	1,03	1,30	2,01	2,38	1,28	1,05	0,61	0,31
23	40G2	339,13	0,00	19,58	132,86	83,96	42,43	20,88	17,42	13,55	8,45
23	41G2	33,93	15,54	16,53	1,69	0,14	0,01	0,02	0,00	0,00	0,00
24	37G2	6,87	6,44	0,33	0,01	0,05	0,04	0,00	0,00	0,00	0,00
24	37G3	12,38	5,57	0,85	1,69	1,23	1,44	0,83	0,42	0,22	0,13
24	37G4	10,83	4,52	0,82	1,49	1,11	1,21	0,93	0,36	0,17	0,22
24	38G2	139,26	128,20	8,14	0,72	0,97	0,78	0,29	0,12	0,00	0,04
24	38G3	1 231,03	1044,68	31,58	37,97	33,20	33,10	26,78	11,39	6,22	6,11
24	38G4	536,90	87,42	114,49	29,89	56,52	137,91	79,45	19,07	7,46	4,69
24	39G2	200,76	102,60	10,11	12,81	19,83	23,44	12,58	10,36	6,01	3,02
24	39G3	1 206,24	508,60	383,67	72,65	82,25	82,77	38,46	18,95	10,03	8,86
24	39G4	443,46	165,21	65,32	54,86	50,73	51,16	27,19	14,03	8,86	6,10
25	37G5	555,60	280,84	118,78	20,13	29,00	73,53	16,55	10,57	2,83	3,37
25	38G5	373,06	143,69	49,27	22,11	25,99	77,91	22,21	17,69	8,19	6,00
25	38G6	206,40	201,23	3,13	0,40	0,38	0,88	0,15	0,16	0,06	0,01
25	38G7	33,19	8,00	9,92	2,10	2,31	6,14	1,72	1,56	0,82	0,62
25	39G4	77,19	6,22	11,76	5,90	21,73	13,49	10,67	5,53	0,43	1,46
25	39G5	524,85	28,35	50,57	34,33	57,08	231,95	52,04	33,17	14,23	23,13
25	39G6	566,39	35,00	45,42	61,03	54,34	203,00	70,09	54,04	26,29	17,18
25	39G7	353,11	38,77	67,01	31,80	32,12	101,17	31,25	27,74	13,42	9,83
25	40G4	1 237,29	10,55	167,20	19,44	194,04	293,10	191,25	146,18	96,52	119,01
25	40G5	1 120,95	7,39	205,38	85,70	243,04	259,95	168,50	62,11	39,93	48,95
25	40G6	811,33	0,00	34,29	48,33	208,28	312,50	84,97	66,23	29,99	26,74
25	40G7	2 236,40	0,00	9,05	9,25	598,40	707,44	272,67	323,67	206,17	109,75
25	41G6	232,52	232,49	0,00	0,00	0,00	0,00	0,00	0,03	0,00	0,00
25	41G7	1 216,36	79,89	0,00	47,78	357,00	157,82	168,43	100,53	130,17	174,74
26	37G8	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
26	37G9	109,06	5,01	12,20	6,14	8,61	24,96	14,59	8,56	16,62	12,37
26	38G8	297,94	12,24	34,73	19,75	26,70	74,91	44,27	21,12	39,41	24,81
26	38G9	624,55	81,07	71,27	39,74	57,20	150,09	85,45	37,48	64,40	37,85
26	39G8	145,52	6,75	21,58	12,38	16,50	41,35	23,32	7,34	10,41	5,89
26	39G9	166,13	1,85	9,12	3,88	10,96	42,46	32,81	20,77	20,39	23,89
26	39H0	183,20	108,60	57,83	3,18	2,27	4,21	1,79	2,31	1,01	2,00
26	40G8	346,10	4,00	53,64	28,53	45,24	102,22	57,15	17,44	23,22	14,66

Table 3.1.2.1. Continued.

SD	RECT	Total	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
26	40G9	177,64	1,83	6,80	7,37	16,23	52,50	39,93	18,81	17,42	16,75
26	40H0	213,31	42,84	2,87	6,98	9,44	31,17	39,11	35,11	28,44	17,35
26	41G8	2 248,56	5,25	2,61	30,88	529,99	841,12	349,40	289,81	11,85	187,65
26	41G9	330,84	0,00	28,04	5,64	27,27	115,45	42,71	55,17	39,18	17,38
26	41H0	1 276,08	0,00	108,17	21,76	105,18	445,28	164,74	212,80	151,12	67,03
27	42G6	291,87	291,87	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
27	42G7	1 441,57	20,41	0,00	58,22	288,30	702,85	267,84	78,96	10,14	14,85
27	43G7	1 564,09	225,56	3,46	63,70	350,02	523,49	232,33	45,83	33,73	85,97
27	44G7	749,62	341,74	0,87	66,07	112,14	97,36	65,64	20,86	21,30	23,64
27	44G8	282,77	11,37	17,55	70,53	113,76	67,45	1,30	0,81	0,00	0,00
27	45G7	3 264,95	665,25	95,53	819,08	861,32	523,45	153,67	27,55	11,75	107,35
27	45G8	1 826,25	1319,81	0,00	91,96	209,11	129,53	50,89	11,99	11,02	1,94
27	46G8	822,49	236,64	5,04	34,56	310,68	139,01	88,61	0,00	5,56	2,39
28A	42G8	17,32	16,66	0,66	0,00	0,00	0,00	0,00	0,00	0,00	0,00
28A	42G9	89,52	0,00	0,62	2,20	9,14	29,04	26,86	12,60	5,13	3,93
28A	42H0	801,16	0,00	11,60	7,55	165,71	384,39	110,96	66,17	29,66	25,12
28A	43G8	1 744,02	0,00	0,00	4,63	258,13	419,12	499,61	309,02	42,56	210,95
28A	43G9	44,40	40,23	0,00	0,00	2,78	1,39	0,00	0,00	0,00	0,00
28A	43H0	358,76	43,06	8,16	6,94	70,83	150,97	34,74	23,40	12,61	8,05
28A	43H1	573,47	468,52	14,80	18,67	27,25	21,09	2,69	7,89	12,56	0,00
28A	44G9	2 765,80	75,52	0,00	197,78	851,88	856,07	416,46	226,44	34,02	107,63
28A	44H0	164,69	15,71	1,86	10,50	27,11	63,07	19,37	13,78	6,35	6,94
28A	44H1	560,48	394,71	2,82	8,16	31,20	72,27	21,59	15,94	6,80	6,99
28A	45G9	1 206,62	744,00	3,17	10,79	211,58	164,45	22,86	16,83	3,18	29,76
28A	45H0	66,81	48,80	1,29	1,14	3,83	6,56	2,00	1,30	0,40	1,49
28A	45H1	524,79	13,40	15,19	31,04	97,14	163,69	55,38	50,69	24,12	74,14
29	46G9	492,34	81,51	1,33	81,85	87,26	162,81	50,00	22,58	3,68	1,32
29	46H0	2 349,50	123,67	15,46	287,51	820,78	840,87	199,40	30,91	15,45	15,45
29	46H1	556,60	129,90	8,23	64,78	105,17	128,33	33,76	32,08	10,08	44,27
29	46H2	5,82	5,82	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
29	47G9	1 753,25	107,65	11,51	371,06	374,66	188,41	474,30	178,56	7,14	39,96
29	47H0	1 053,78	342,25	33,98	188,82	353,13	108,29	2,31	9,26	0,00	15,74
29	47H1	1 670,28	30,26	51,16	309,92	478,60	449,88	100,17	93,63	27,62	129,04
29	47H2	136,57	10,57	16,41	40,44	34,49	22,94	4,01	3,07	1,08	3,56
29	48G9	2 941,79	336,16	393,30	715,91	460,50	571,43	186,57	154,63	25,21	98,08
29	48H0	951,68	765,87	18,44	59,97	53,09	35,60	6,85	5,14	1,22	5,50
29	48H1	1 974,60	88,49	187,28	571,32	501,00	370,86	77,65	65,22	23,22	89,56
29	48H2	1 208,38	847,51	95,39	104,33	76,11	48,96	9,04	11,12	3,35	12,57
29	49G9	831,06	18,71	49,46	371,64	216,12	105,61	16,93	31,64	14,71	6,24
30	50G7	493,50	140,18	48,87	66,53	132,82	37,84	29,99	10,25	1,69	25,33
30	50G8	1 781,23	677,85	169,90	162,41	391,68	209,75	45,35	40,54	3,01	80,74
30	50G9	738,40	15,68	48,99	348,32	202,77	85,00	9,81	3,91	2,00	21,92
30	50H0	2 351,14	18,53	391,97	582,02	961,24	317,75	46,32	0,00	0,00	33,31
30	51G7	766,74	21,85	102,88	199,93	229,05	75,22	79,58	4,85	4,85	48,53
30	51G8	1 684,38	19,59	77,67	108,54	880,29	89,75	128,52	139,02	21,75	219,25
30	51G9	1 899,38	22,80	28,90	310,33	420,49	499,93	203,56	121,82	134,34	157,21
30	51H0	1 952,05	21,25	26,24	382,03	445,48	180,32	378,71	171,06	4,06	342,90
30	52G7	383,77	5,69	28,43	120,81	88,97	45,77	16,77	38,94	8,53	29,86
30	52G8	1 188,81	5,55	1,82	113,22	231,45	177,95	272,83	154,21	25,46	206,32
30	52G9	1 035,84	3,50	21,00	434,63	239,36	199,47	51,09	59,49	3,50	23,80
30	52H0	1 813,28	148,61	188,63	482,97	220,93	0,00	270,61	58,52	53,21	389,80
30	53G7	1 218,42	71,66	126,47	176,23	197,31	50,59	241,16	80,95	52,28	221,77
30	53G8	1 628,27	13,26	138,43	407,12	510,03	161,78	115,50	52,82	28,36	200,97
30	53G9	1 569,84	8,75	32,89	112,93	132,34	120,51	182,59	148,54	172,13	659,16
30	53H0	2 763,78	142,42	785,69	698,17	549,81	240,97	134,25	124,57	9,44	78,46
30	54G8	1 240,84	389,02	159,01	152,19	119,82	73,83	90,29	46,00	9,65	201,03
30	54G9	1 526,14	61,00	70,21	464,16	191,92	78,34	294,74	39,81	22,38	303,58
30	54H0	2 466,73	71,13	818,30	383,87	709,98	164,05	199,22	0,00	0,00	120,18
30	55G9	855,89	3,40	0,00	16,98	130,42	110,72	175,26	69,29	50,95	298,87

Table 3.1.2.1. Continued.

SD	RECT	Total	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
30	55H0	371,83	71,35	236,70	52,61	5,05	2,52	0,90	0,90	0,00	1,80
32	47H3	673,67	150,15	70,44	151,65	140,51	95,31	19,98	4,44	11,84	29,35
32	48H3	26,22	24,63	1,37	0,22	0,00	0,00	0,00	0,00	0,00	0,00
32	48H4	576,47	42,47	63,23	148,84	145,78	101,32	22,97	6,71	13,33	31,82
32	48H5	79,50	19,74	20,31	23,54	7,32	4,83	1,01	0,43	0,49	1,83
32	48H6	132,77	33,19	16,67	32,68	23,79	15,61	3,44	0,67	2,02	4,70
32	49H5	6,36	4,77	0,77	0,37	0,21	0,13	0,05	0,00	0,03	0,03
32	49H6	8,18	6,14	0,99	0,48	0,27	0,17	0,07	0,00	0,03	0,03

Table 3.1.2.2. Estimated numbers (millions) of sprat in September-October 2011, by the ICES rectangles, accordingly to age groups.

SD	RECT	Total	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	41G0	18,87	0,00	6,66	10,79	1,42	0,00	0,00	0,00	0,00	0,00
21	41G1	204,95	0,00	26,61	116,43	43,85	12,65	4,27	0,85	0,29	0,00
21	41G2	33,76	0,00	4,51	17,59	7,76	2,92	0,61	0,23	0,14	0,00
21	42G1	159,89	0,00	4,88	61,37	51,01	30,06	4,84	5,36	2,37	0,00
21	42G2	45,46	0,00	6,03	20,02	11,27	5,62	1,22	0,88	0,42	0,00
22	37G0	1,67	0,00	1,13	0,18	0,18	0,10	0,00	0,02	0,06	0,00
22	37G1	236,15	0,98	226,82	6,87	0,71	0,62	0,00	0,00	0,15	0,00
22	38G0	118,22	0,00	112,33	5,17	0,40	0,22	0,00	0,03	0,07	0,00
22	38G1	57,83	0,15	54,36	3,12	0,17	0,03	0,00	0,00	0,00	0,00
22	39F9	31,25	23,83	7,27	0,15	0,00	0,00	0,00	0,00	0,00	0,00
22	39G0	20,81	0,00	19,80	0,93	0,07	0,01	0,00	0,00	0,00	0,00
22	39G1	24,43	3,57	17,67	1,98	0,82	0,30	0,00	0,09	0,00	0,00
22	40F9	5,37	0,23	4,79	0,29	0,04	0,02	0,00	0,00	0,00	0,00
22	40G0	74,46	3,23	66,40	4,09	0,51	0,23	0,00	0,00	0,00	0,00
22	40G1	0,35	0,00	0,20	0,12	0,03	0,00	0,00	0,00	0,00	0,00
22	41G0	12,91	0,05	10,95	1,39	0,39	0,10	0,00	0,03	0,00	0,00
23	39G2	33,95	0,89	14,98	9,07	5,91	1,46	1,32	0,30	0,00	0,02
23	40G2	166,66	12,26	67,00	24,16	32,77	22,39	5,98	2,10	0,00	0,00
23	41G2	6,80	0,16	4,54	1,08	0,69	0,23	0,05	0,05	0,00	0,00
24	37G2	49,68	7,62	20,12	11,81	7,15	1,42	1,35	0,20	0,00	0,01
24	37G3	395,55	229,23	126,11	30,34	2,03	7,45	0,35	0,04	0,00	0,00
24	37G4	32,21	7,36	12,58	6,73	3,61	1,04	0,71	0,17	0,00	0,01
24	38G2	373,47	46,33	210,96	89,81	17,08	5,54	3,37	0,35	0,00	0,03
24	38G3	2 709,13	596,81	1 262,75	562,69	172,39	71,90	32,82	8,98	0,00	0,79
24	38G4	588,49	134,37	229,74	122,98	66,05	19,07	13,03	3,10	0,00	0,18
24	39G2	334,46	8,75	147,58	89,36	58,25	14,36	13,04	2,91	0,00	0,21
24	39G3	2 278,79	54,71	944,30	634,11	440,80	101,43	87,88	13,99	0,00	1,57
24	39G4	257,36	3,75	73,28	60,12	64,11	29,20	20,47	6,43	0,00	0,00
25	37G5	608,02	348,70	143,88	62,82	43,77	6,29	2,56	0,00	0,00	0,00
25	38G5	847,58	167,13	277,27	179,29	179,41	34,01	10,47	0,00	0,00	0,00
25	38G6	1 286,09	602,68	370,48	158,66	124,85	22,20	7,22	0,00	0,00	0,00
25	38G7	8,46	0,80	4,86	1,47	1,09	0,18	0,06	0,00	0,00	0,00
25	39G4	457,59	21,34	216,71	18,49	152,69	18,49	29,87	0,00	0,00	0,00
25	39G5	651,93	35,67	90,84	101,23	296,66	5,47	57,70	25,27	10,12	28,97
25	39G6	303,42	29,71	156,75	59,82	47,84	7,35	1,95	0,00	0,00	0,00
25	39G7	165,50	7,83	82,25	35,06	32,20	6,29	1,87	0,00	0,00	0,00
25	40G4	359,90	16,06	83,23	31,00	180,03	13,90	9,95	0,00	17,20	8,53
25	40G5	1 137,89	276,90	110,45	40,54	396,40	116,45	118,96	51,55	0,00	26,64
25	40G6	561,69	5,91	73,74	81,14	126,67	66,44	115,94	34,94	17,62	39,29

Table 3.1.2.2. Continued.

SD	RECT	Total	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
25	40G7	311,61	0,69	78,25	16,33	106,52	32,67	34,87	31,71	10,57	0,00
25	41G6	9,42	7,93	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1,49
25	41G7	1 695,34	151,80	186,95	7,78	1 222,10	59,69	63,71	0,00	3,31	0,00
26	37G8	798,12	795,16	2,07	0,74	0,15	0,00	0,00	0,00	0,00	0,00
26	37G9	577,83	478,79	72,60	13,66	9,79	0,88	1,23	0,88	0,00	0,00
26	38G8	314,48	50,26	179,52	49,60	28,72	2,74	1,45	2,19	0,00	0,00
26	38G9	1 184,67	495,77	382,67	126,00	142,76	5,28	30,21	1,99	0,00	0,00
26	39G8	135,33	2,53	63,94	34,48	26,61	3,34	1,96	2,47	0,00	0,00
26	39G9	2 936,32	81,32	1 005,16	345,52	1 014,27	29,66	407,94	6,65	0,00	45,80
26	39H0	2 042,20	1 545,00	349,44	53,56	81,38	0,25	8,23	0,00	0,00	4,34
26	40G8	6,77	0,00	3,11	1,81	1,39	0,19	0,15	0,12	0,00	0,00
26	40G9	3 379,71	477,95	1 052,32	96,54	1 294,49	27,25	360,17	11,63	11,63	47,73
26	40H0	2 981,21	2 601,52	202,15	81,73	54,01	31,59	7,30	2,91	0,00	0,00
26	41G8	2 503,99	61,11	52,54	187,80	1 569,26	216,14	412,96	4,18	0,00	0,00
26	41G9	1 240,63	165,35	182,31	156,18	465,14	91,17	95,42	22,93	22,15	39,98
26	41H0	3 313,48	602,23	668,56	429,87	965,10	320,35	189,84	36,76	16,72	84,05
27	42G6	205,07	161,63	10,86	2,17	21,47	3,38	3,14	1,21	0,00	1,21
27	42G7	77,31	5,57	4,53	3,62	40,87	6,14	6,54	4,44	0,00	5,60
27	43G7	238,84	43,82	14,81	8,62	102,97	2,09	26,33	7,14	4,19	28,87
27	44G7	202,04	187,01	1,43	3,72	8,02	0,00	1,86	0,00	0,00	0,00
27	44G8	3,29	0,00	0,00	0,00	0,94	0,47	0,00	0,00	0,94	0,94
27	45G7	1 303,84	1 125,87	14,95	5,72	67,98	7,45	18,80	9,27	7,08	46,72
27	45G8	1 393,73	1 265,92	11,75	4,56	62,21	7,72	3,30	2,72	8,08	27,47
27	46G8	4 932,51	2 113,26	193,35	209,49	1 913,80	136,48	158,12	0,00	196,34	11,67
28A	42G8	1 295,22	452,41	47,47	39,06	463,75	52,21	102,64	64,73	50,57	22,38
28A	42G9	1 942,54	88,32	92,05	192,18	1 058,58	73,92	214,71	91,03	60,90	70,85
28A	42H0	3 427,68	446,70	517,42	251,98	1 430,18	204,01	129,38	117,39	139,32	191,30
28A	43G8	8,23	2,47	0,00	0,82	1,65	1,65	0,82	0,00	0,00	0,82
28A	43G9	3 819,25	219,17	73,96	21,79	2 760,13	47,16	478,36	0,00	194,52	24,16
28A	43H0	2 938,88	315,94	519,15	360,48	1 110,24	141,05	171,95	87,57	88,36	144,14
28A	43H1	1 574,89	203,00	422,23	159,72	392,45	112,02	152,44	33,25	32,92	66,86
28A	44G9	4 704,59	2 602,85	139,49	179,39	1 438,80	150,03	97,79	0,00	8,80	87,44
28A	44H0	5 063,24	2 192,36	478,08	265,98	1 399,68	170,91	216,80	156,63	92,39	90,41
28A	44H1	4 294,83	1 938,66	592,31	301,04	1 110,96	70,24	117,71	113,52	2,79	47,60
28A	45G9	2 731,11	838,69	763,55	189,32	836,17	91,36	0,00	6,01	6,01	0,00
28A	45H0	5 873,41	831,58	361,78	620,55	2 383,56	913,98	279,05	212,58	198,97	71,36
28A	45H1	1 466,66	63,46	110,89	144,92	649,74	263,93	85,24	62,41	56,99	29,08
29	46G9	6 371,27	3 903,73	494,51	0,00	1 437,46	156,38	106,43	65,89	0,00	206,87
29	46H0	3 737,75	1 576,66	304,46	103,30	807,35	551,82	125,04	81,55	35,34	152,23
29	46H1	10 462,87	467,97	1 069,75	1 385,31	4 037,73	1 953,76	693,32	504,18	93,57	257,28
29	46H2	533,20	102,54	82,87	85,04	166,94	55,94	18,19	13,75	2,26	5,67
29	47G9	4 144,37	2 193,97	255,41	377,88	831,61	94,88	144,78	0,00	33,61	212,23
29	47H0	5 816,66	1 575,13	1 632,95	215,68	1 493,48	438,61	183,53	0,00	34,91	242,37
29	47H1	5 440,33	134,94	956,16	798,19	2 258,21	706,96	190,63	161,30	162,01	71,93
29	47H2	3 089,97	44,78	328,00	433,23	1 321,05	585,79	175,00	127,04	18,47	56,61
29	48G9	2 613,26	2 388,43	9,37	18,74	73,08	0,00	63,70	18,74	13,11	28,09
29	48H0	6 145,72	4 304,98	360,38	249,79	698,06	307,37	94,34	79,18	11,40	40,22
29	48H1	1 943,25	9,57	175,06	202,30	736,56	412,93	174,49	123,08	30,55	78,71
29	48H2	4 211,50	1 108,42	381,50	476,83	1 332,13	553,47	165,76	120,04	17,98	55,37
29	49G9	1,23	0,00	0,00	0,00	0,31	0,31	0,00	0,00	0,00	0,61
30	50G7	48,69	9,33	1,96	0,84	4,06	2,49	4,75	0,51	0,00	24,75

Table 3.1.2.2. Continued.

SD	RECT	Total	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
30	50G8	112,91	42,88	6,51	2,47	13,86	13,53	3,75	3,27	0,00	26,64
30	50G9	8,38	0,55	0,11	0,11	0,86	0,44	1,01	0,00	0,44	4,86
30	50H0	22,41	0,00	0,00	0,00	4,66	0,80	4,52	2,26	0,00	10,17
30	51G7	26,33	0,00	0,84	0,35	1,26	0,70	3,72	0,00	0,00	19,46
30	51G8	71,94	2,35	1,57	1,27	6,16	0,29	8,83	0,00	0,00	51,47
30	51G9	52,67	0,00	0,41	0,52	7,37	1,99	3,71	1,40	1,40	35,87
30	51H0	82,31	0,00	1,72	3,10	10,64	5,52	0,70	0,00	2,48	58,15
30	52G7	15,77	0,00	0,00	0,22	0,53	0,31	1,75	1,40	0,00	11,56
30	52G8	2,98	0,00	0,00	0,32	0,00	0,00	0,00	0,00	0,00	2,66
30	52G9	54,59	0,00	1,99	0,99	2,88	0,00	3,38	0,00	2,88	42,47
30	52H0	100,80	0,00	5,00	6,55	6,58	5,59	0,00	3,29	3,10	70,69
30	53G7	55,31	0,00	3,87	2,69	7,92	6,13	0,00	3,14	0,00	31,56
30	53G8	67,86	0,00	4,39	0,00	7,91	0,56	6,08	5,85	0,35	42,72
30	53G9	11,42	0,00	0,00	0,00	0,00	0,57	0,00	0,56	1,61	8,68
30	53H0	161,50	0,71	7,53	8,90	41,76	5,74	14,36	9,08	0,00	73,42
30	54G8	354,14	0,00	29,41	9,94	31,06	46,39	86,57	13,25	12,43	125,09
30	54G9	25,83	0,00	0,62	0,00	3,78	0,00	0,94	0,00	0,94	19,55
30	54H0	52,75	0,00	0,00	0,00	1,82	2,55	1,82	0,00	8,38	38,18
30	55G9	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
30	55H0	1 919,79	0,00	119,06	51,05	342,65	125,15	142,16	0,00	0,00	1 139,72
32	47H3	1 535,90	116,50	351,94	209,90	622,41	176,08	38,28	11,60	1,31	7,88
32	48H3	5 012,01	443,64	1 453,80	640,34	1 828,42	485,65	105,01	33,10	3,15	18,90
32	48H4	8 357,09	128,96	1 767,66	1 183,84	3 853,09	1 096,77	225,04	60,92	4,56	36,25
32	48H5	7 263,16	413,08	1 441,25	980,26	3 058,77	903,18	279,87	63,44	8,84	114,47
32	48H6	6 193,40	645,80	1 216,01	831,05	2 452,66	771,41	182,36	57,75	5,19	31,17
32	49H5	3 168,50	253,14	752,00	516,17	1 221,72	337,12	61,57	18,69	1,16	6,93
32	49H6	4 079,49	325,92	968,21	664,58	1 572,99	434,04	79,27	24,07	1,49	8,92

Table 3.1.2.3. Estimated numbers (millions) of cod in September-October 2005–2011, by the ICES rectangles.

ICES SD	Rect.	Area [NM^2]	2005	2006	2007	2008	2009	2010	2011
24	37G2	192,40	2,17	0,00	1,82	0,00	0,00	0,00	0,00
24	37G3	167,70	0,00	4,14	0,87	1,18	0,72	4,26	0,00
24	37G4	875,10	9,50	0,13	4,27	5,16	1,41	2,60	0,02
24	38G2	832,90	10,86	0,00	1,95	0,00	0,00	1,93	1,07
24	38G3	865,70	0,28	0,00	1,61	1,07	1,97	3,57	0,40
24	38G4	1034,80	3,10	0,27	4,86	6,85	0,48	2,18	0,20
24	39G2	406,10	1,49	3,89	1,76	0,41	1,97	3,77	0,05
24	39G3	765,00	17,92	3,78	13,93	2,76	0,55	3,80	0,35
24	39G4	524,80	2,70	1,82	2,44	1,19	1,58	7,09	0,21
25	37G5	642,20	17,83	0,25	1,31	0,00	0,38	0,21	0,00
25	38G5	1035,70	57,28	2,06	5,20	0,74	2,92	4,54	18,40
25	38G6	940,20	9,54	3,00	17,12	2,52	0,27	0,23	0,00
25	38G7	471,70	0,00	0,13	0,04	0,92	0,37	0,85	0,00
25	39G4	287,30	2,67	28,46	0,22	4,36	0,35	0,29	0,22
25	39G5	979,00	0,75	1,80	0,90	1,57	1,25	3,10	35,67
25	39G6	1026,00	0,86	6,50	0,69	4,05	0,48	16,71	3,48
25	39G7	1026,00	47,40	0,52	0,44	5,78	0,26	0,18	2,18
25	40G4	677,20	1,38	5,54	15,86	0,22	19,19	0,33	25,27
25	40G5	1012,90	2,40	7,60	4,89	25,09	1,81	0,81	14,00
25	40G6	1013,00	1,13	6,53	0,24	5,94	6,54	7,03	30,84

Table 3.1.2.3. Continued.

ICES SD	Rect.	Area [NM^2]	2005	2006	2007	2008	2009	2010	2011
25	40G7	1013,00	2,85	2,89	0,00	3,13	1,75	0,25	9,31
25	41G6	764,40	2,69	14,80	0,00	2,53	0,63	0,36	0,00
25	41G7	1000,00	0,08	1,90	8,71	0,25	4,40	1,12	61,89
26	37G8	86,00	0,46	3,25	0,00	0,23	0,00	0,03	0,00
26	37G9	151,60	37,64	0,89	1,59	0,99	0,32	0,21	0,51
26	38G8	624,60	37,05	4,97	1,68	3,39	2,01	1,43	1,29
26	38G9	918,20	0,00	0,00	0,00	0,00	0,26	0,00	1,31
26	39G8	1026,00	32,28	22,10	1,63	0,83	4,33	4,71	19,88
26	39G9	1026,00	0,00	0,00	0,00	0,00	0,35	0,00	0,92
26	39H0	881,60					0,00	0,00	0,02
26	40G8	1013,00	17,82	4,57	0,54	0,21	0,55	6,77	3,96
26	40G9	1013,00	0,00		0,00	0,00	1,51	0,00	0,21
26	40H0	1012,10	5,10		0,00	0,71	34,59	51,72	1,12
26	41G8	1000,00	0,00	2,62		0,04	1,16	1,59	21,93
26	41G9	1000,00	10,00	0,07	3,21	0,18	0,00	1,05	0,00
26	41H0	953,30	54,47	0,24	3,39	1,92	0,00	0,09	0,00
27	42G6	266,00		2,23	0,04	0,00	1,14	0,02	0,00
27	42G7	986,90	1,02	1,14	0,49	0,02	0,88	0,00	1,57
27	43G6	269,80				0,00			
27	43G7	913,80	0,00	22,02	0,00	0,08	0,00	0,50	0,09
27	44G7	960,50	0,00	1,19	1,25	0,42	0,00	0,23	0,00
27	44G8	456,60	0,00	0,00	0,00	0,03	0,51	0,23	0,09
27	45G7	908,70	0,00	0,00	0,00	1,57	0,00	0,00	0,00
27	45G8	947,20	0,00	2,22	0,23	0,00	0,00	0,00	0,00
27	46G8	884,80	0,00	0,21	0,00	0,00	0,00	0,00	0,07
28A	42G8	945,40	2,35	0,00	3,73	1,65	0,24	1,29	0,00
28A	42G9	986,90	0,00	0,23	0,56	1,33	0,00	0,00	0,00
28A	42H0	968,50	0,00	0,37	10,37	2,89	0,00	0,14	0,00
28A	43G8	296,20	0,32	0,00	0,00	0,19	0,00	0,00	0,00
28A	43G9	973,70	0,00	0,16	12,71	1,04	1,39	0,00	0,00
28A	43H0	973,70	0,00	0,12	3,57	0,00	0,00	0,07	0,00
28A	43H1	412,70	0,00	0,05	0,00	0,00	0,00	0,14	0,00
28A	44G9	876,60	0,00	0,00	0,47	0,61	0,00	0,46	2,28
28A	44H0	960,50	0,00	0,47	0,00	0,00	0,00	0,00	0,00
28A	44H1	824,60	0,00	0,00	0,00	0,00	0,00	0,07	0,00
28A	45G9	924,50	0,27	0,00	0,10	0,00	0,36	0,00	0,00
28A	45H0	947,20	0,00	0,00	0,08	0,15	0,00	0,02	0,00
28A	45H1	827,10	0,00	0,00	0,07	0,00	0,00	0,05	0,00
29	46G9	933,80	0,03	0,00	0,48	0,18	0,00	0,00	0,00
29	46H0	933,80	0,00	0,00	0,00	0,13	0,00	0,00	0,00
29	46H1	921,50	0,00	0,00	0,00	0,00	0,00	0,42	0,00
29	46H2	258,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
29	47G9	876,20	2,82	0,00	0,00	0,00	0,00	0,00	0,00
29	47H0	920,30	0,00	0,00	0,63	0,29	0,00	0,00	0,00
29	47H1	920,30	0,00	0,00	0,00	0,00	0,00	0,00	8,77
29	47H2	793,90	0,00	0,00	0,00	0,00	0,00	0,00	0,00
29	48G9	772,80	0,00	0,00	0,00	0,00	0,00	0,00	0,00
29	48H0	730,30			0,00	0,00	0,00	0,00	0,00
29	48H1	544,00			0,00		0,00	0,00	0,00
29	48H2	597,00			0,00	0,00	0,00	0,00	0,00
29	49G9	564,20			0,00	0,00	0,00	0,00	0,00

Table 3.1.2.4. Estimated numbers (millions) of herring by the ICES Subdivisions, according to age groups; September-October 2011.

Sub-div.	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	379,43	590,80	10,90	0,00	0,00	0,00	0,00	0,00	0,00
22	403,37	49,96	2,68	0,34	0,00	0,00	0,00	0,00	0,00
23	25,95	37,14	135,85	86,11	44,82	22,18	18,47	14,16	8,76
24	2 053,24	615,31	212,09	245,89	331,85	186,51	74,70	38,97	29,17
25	1 072,42	771,78	388,30	1 823,71	2 438,88	1 090,50	849,21	569,05	540,79
26	269,44	408,86	186,23	855,59	1 925,72	895,27	726,72	423,47	427,62
27	3 112,65	122,45	1 204,12	2 245,33	2 183,14	860,28	186,00	93,50	236,14
28A	1 860,61	60,17	299,40	1 756,58	2 332,11	1 212,52	744,06	177,39	475,00
29	2 888,37	881,95	3 167,55	3 560,91	3 033,99	1 160,99	637,84	132,76	461,29
30	1 933,07	3 503,00	5 776,00	6 991,21	2 922,06	2 967,05	1 365,49	607,59	3 664,79
32	281,09	173,78	357,78	317,88	217,37	47,52	12,25	27,74	67,76

Table 3.1.2.5. Estimated numbers (millions) of sprat by the ICES Subdivisions, according to age groups; September-October 2011.

Sub-div.	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	0,00	48,69	226,20	115,31	51,25	10,94	7,32	3,22	0,00
22	32,04	521,72	24,29	3,32	1,63	0,00	0,17	0,28	0,00
23	13,31	86,52	34,31	39,37	24,08	7,35	2,45	0,00	0,02
24	1 088,93	3 027,42	1 607,94	831,46	251,41	173,01	36,16	0,00	2,80
25	1 673,15	1 875,66	793,63	2 910,23	389,43	455,13	143,47	58,82	104,92
26	7 356,99	4 216,38	1 577,49	5 653,07	728,84	1 516,86	92,70	50,50	221,90
27	4 903,08	251,68	237,90	2 218,26	163,73	218,09	24,78	216,63	122,48
28A	10 195,61	4 118,38	2 727,23	15 035,89	2 292,47	2 046,89	945,12	932,54	846,40
29	17 811,12	6 050,42	4 346,29	15 193,97	5 818,22	2 135,21	1 294,75	453,21	1 408,19
30	55,82	184,99	89,32	495,76	218,75	288,05	44,01	34,01	1 837,67
32	2 327,04	7 950,87	5 026,14	14 610,06	4 204,25	971,40	269,57	25,70	224,52

Table 3.1.3.1. Area corrected numbers (millions) of herring by the ICES Subdivisions and age groups (September-October 2011).

Sub-div.	AREA_CORR_ FACTOR	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	1,55	586,64	913,44	16,85	0,00	0,00	0,00	0,00	0,00	0,00
22	1,02	411,69	50,99	2,74	0,35	0,00	0,00	0,00	0,00	0,00
23	1,00	25,95	37,14	135,85	86,11	44,82	22,18	18,47	14,16	8,76
24	1,00	2 053,24	615,31	212,09	245,89	331,85	186,51	74,70	38,97	29,17
25	1,03	1 106,73	796,47	400,72	1 882,05	2 516,90	1 125,38	876,38	587,25	558,09
26	1,01	272,55	413,58	188,38	865,47	1 947,94	905,60	735,11	428,36	432,56
27	1,23	3 830,86	150,70	1 481,96	2 763,41	2 686,87	1 058,78	228,92	115,07	290,63
28A	1,07	1 995,60	64,54	321,12	1 884,02	2 501,31	1 300,49	798,04	190,26	509,46
29	1,04	3 003,15	917,00	3 293,43	3 702,42	3 154,56	1 207,13	663,19	138,04	479,62
30	1,06	2 041,68	3 699,81	6 100,51	7 384,00	3 086,23	3 133,75	1 442,21	641,73	3 870,69
32	1,69	476,39	294,52	606,36	538,74	368,39	80,54	20,76	47,01	114,84

Table 3.1.3.2. Area corrected numbers (millions) of sprat by the ICES Subdivisions and age groups (September-October 2011).

Sub-div.	AREA_CORR_ FACTOR	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	1,55	0,00	75,28	349,73	178,28	79,24	16,91	11,32	4,98	0,00
22	1,02	32,70	532,48	24,79	3,39	1,66	0,00	0,17	0,29	0,00
23	1,00	13,31	86,52	34,31	39,37	24,08	7,35	2,45	0,00	0,02
24	1,00	1 088,93	3 027,42	1 607,94	831,46	251,41	173,01	36,16	0,00	2,80
25	1,03	1 726,67	1 935,66	819,02	3 003,32	401,89	469,69	148,06	60,70	108,28
26	1,01	7 441,86	4 265,03	1 595,69	5 718,29	737,25	1 534,36	93,77	51,08	224,46
27	1,23	6 034,40	309,75	292,79	2 730,10	201,51	268,41	30,50	266,61	150,74
28A	1,07	10 935,33	4 417,18	2 925,10	16 126,78	2 458,79	2 195,40	1 013,69	1 000,20	907,81
29	1,04	18 518,93	6 290,86	4 519,01	15 797,77	6 049,43	2 220,06	1 346,20	471,22	1 464,15
30	1,06	58,96	195,38	94,34	523,61	231,04	304,23	46,48	35,92	1 940,92
32	1,69	3 943,82	13 474,98	8 518,20	24 760,84	7 125,28	1 646,31	456,86	43,56	380,51

Table 3.1.3.3. Estimated biomass (in tons) of herring in September-October 2011.

Sub-div.	AREA_CORR_ FACTOR	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
25	1,03	9 328,84	24 842,35	16 485,68	74 128,51	115 968,17	60 722,09	50 669,84	36 950,96	36 294,14
26	1,01	2 725,34	12 259,33	7 768,19	30 744,15	76 814,69	40 150,14	34 595,56	24 268,19	25 485,25
27	1,23	15 265,03	2 224,33	27 885,39	64 588,37	84 401,07	37 404,52	9 550,84	4 128,86	12 567,72
28A	1,07	11 525,35	1 530,56	7 089,25	51 420,36	76 476,45	47 049,17	30 916,31	7 572,46	23 048,12
29	1,04	14 356,74	11 545,60	56 848,19	78 182,46	74 654,10	32 315,34	19 298,52	4 581,14	14 483,61
30	1,06	9 579,22	50 223,65	122 984,90	176 547,78	85 227,08	93 514,44	45 003,47	22 004,01	168 971,10
32	1,69	1 728,52	3 659,29	9 123,71	9 635,41	6 913,43	1 565,67	466,17	882,23	2 290,75

Table 3.1.3.4. Estimated biomass (in tons) of sprat in September-October 2011.

Sub-div.	AREA_CORR_ FACTOR	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	1,55		1 232,60	6 501,00	3 668,01	1 767,82	369,55	288,51	124,46	
22	1,02	22,41	5 764,62	316,03	55,72	29,40		3,30	5,05	
23	1,00	69,70	1 130,76	542,97	754,07	508,53	157,92	59,28		0,45
24	1,00	5 301,48	37 032,76	21 996,68	13 934,41	4 181,55	3 036,37	726,62		62,33
25	1,03	7 812,82	21 013,16	10 534,04	41 678,12	6 676,26	8 181,63	2 739,16	1 127,60	1 793,74
26	1,01	16 543,85	17 428,27	12 579,55	41 811,76	9 184,48	10 079,43	1 060,33	551,58	1 655,71
27	1,23	15 671,73	2 424,40	3 029,55	30 350,83	2 438,18	3 144,19	385,57	3 192,69	1 893,16
28A	1,07	35 407,49	39 964,51	30 756,77	184 193,25	29 282,14	28 097,96	12 414,84	12 500,48	11 149,77
29	1,04	55 784,17	51 913,52	41 743,62	156 306,12	64 311,11	24 909,72	14 646,83	5 398,79	17 262,84
30	1,06	253,93	2 066,13	995,14	6 445,96	3 122,60	4 297,80	674,39	497,35	29 931,95
32	1,69	12 693,71	103 398,15	59 431,88	242 110,91	73 152,15	18 315,47	5 122,78	528,33	4 702,33

Table 3.1.4.3.1. Correction factor and area corrected numbers (millions) of herring per age groups in the ICES Subdivision 30.

YEAR	Sub-div.	AREA_CORR_ FACTOR	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8
1999	30	1,28	100,45	187,68	561,32	252,25	228,34	252,55	140,65	156,24	188,65
2000	30	1,06	104,19	3 846,00	928,57	1 794,16	4 429,95	2 048,50	2 704,11	4 361,30	8 552,91
2007	30	1,06	442,53	5 670,78	4 916,19	1 845,69	1 507,59	5 254,43	1 441,11	826,08	2 347,95
2008	30	1,20	859,15	2 669,79	4 846,31	3 386,30	1 649,49	1 825,30	3 344,39	1 265,96	3 049,00
2009	30	1,06	679,46	3 573,39	5 089,63	5 558,51	2 438,03	1 282,91	1 518,46	3 615,98	3 757,41
2010	30	1,06	452,73	3 989,84	6 534,82	3 500,95	3 535,59	1 576,84	982,35	891,26	4 479,00
2011	30	1,06	2 041,68	3 699,81	6 100,51	7 384,00	3 086,23	3 133,75	1 442,21	641,73	3 870,69

3.2 Combined results of the Baltic Acoustic Spring Survey (BASS)

In 2011, the following acoustic surveys were conducted in May–June.

Vessel	Country	ICES Subdivisions
Walther Herwig III	Germany	24, 25, parts of 26 and 28
Darius	Latvia	Parts of 26 and 28
Darius	Lithuania	Part of 26

Stock indices of sprat by age groups of the different BASS cruises are stored in the BASS database. The standard reports from BASS 2011 cruise are presented in Annex 8.

3.2.1 Area under investigation and overlapping areas

The BASS 2011 surveys were realized by Germany, Lithuania and Latvia in the ICES Subdivisions 24, 25, 26 and 28. Four statistical rectangles (G945, G944, G943, and G942) were inspected by more than one country (Figure 3.2.1.1). The area coverage of the Baltic Sea with the BASS/2011 survey was the same as required by the WGBIFS 2011.

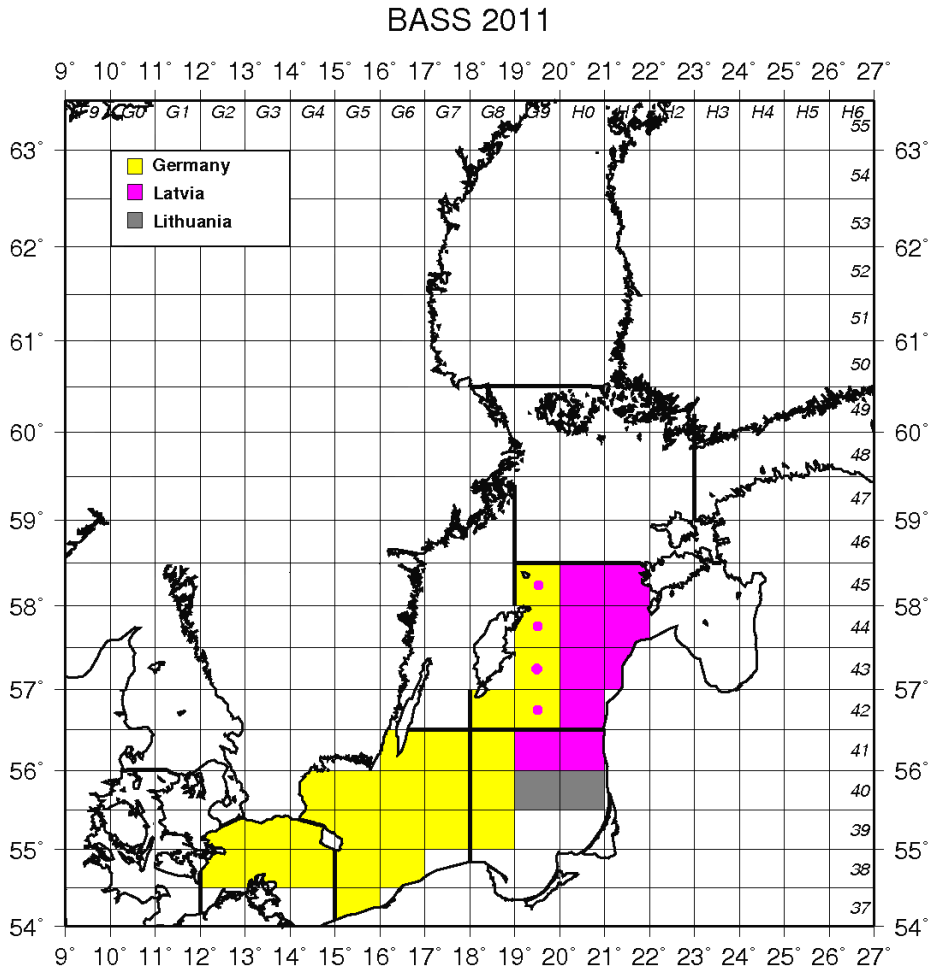


Figure 3.2.1.1. Map of BASS surveys conducted in May 2011. Colours indicate the countries, which covered specific ICES-rectangles and delivered data to BAD1-database, thus was responsible for this rectangle. Dot with different colour within a rectangle explain additional data in BAD1 partly or totally covered by other countries.

Differences in the results of these overlapped areas have no significant effect on the calculation of the tuning fleet indices. Therefore, in the calculation of the indices, the data from the country responsible for specific rectangle was used.

The estimated numbers of sprat per age groups and the ICES rectangles are presented in Table 3.2.1.1. The geographical distribution of the sprat abundance is demonstrated in Figure 3.2.1.2.

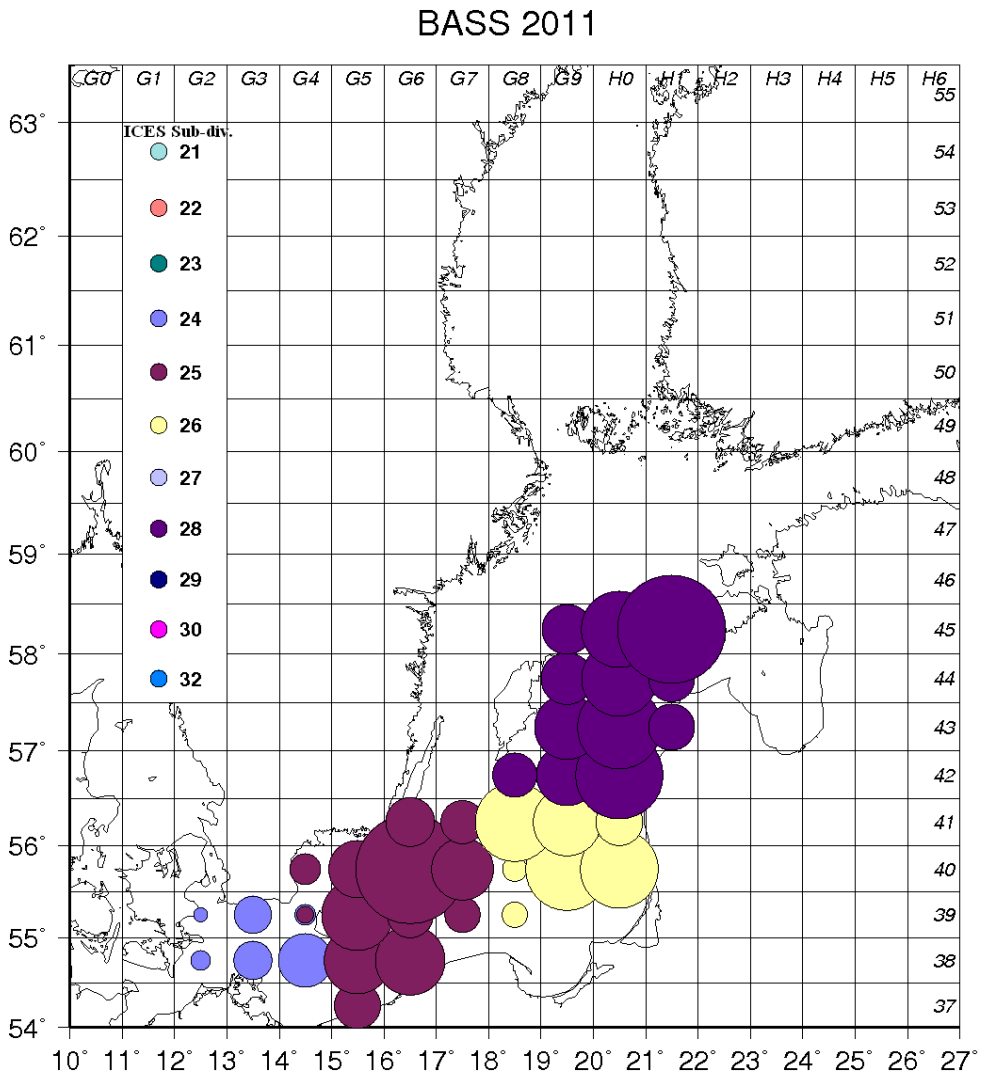


Figure 3.2.1.2. Covered the ICES-rectangles in May 2011 with the abundance of sprat (the area of the circles indicates the estimate number of sprat in 10^6 indiv. in the rectangle, the colour indicates the ICES Subdivision).

During late spring, sprat is concentrated in the deeper Baltic basins for spawning. Herring stays at this time primarily in shallow water areas close to coasts however, small fraction of herring started to migrate to deeper waters for feeding after spawning. The portion of herring is much smaller than 10% in most areas. These numbers should not be used for the estimation of abundance. Therefore, only the distribution of sprat is examined in further.

3.2.2 Combined results and area corrected data

The Baltic sprat stock abundance estimates per the ICES Subdivisions and age groups are presented in Table 3.2.2.1.

During the WGBIFS 2006 meeting possible improvement of the results from acoustic surveys were discussed, and a correction factor for each ICES Subdivision and year was introduced because of the coverage of the investigated area differed in the years. This factor is the proportion to the total area of the ICES Subdivision (see IBAS manual) and the area of rectangles covered during the survey. The correction factors, calculated by ICES Subdivisions for 2011 are included in Tables 3.2.2.2 and 3.2.2.3. The area corrected abundance estimates for sprat per ICES Subdivision are summarized in Table 3.2.2.2. The corresponding biomass estimates of sprat are given in the Table 3.2.2.3.

3.2.2.1 Sprat in the ICES Subdivisions 24 to 26 and 28

Correction of the data from year 2009

The consistency check of cohort development indicated a significant underestimation of the year-class 2004 in 2009. An analysis showed that it was caused by the difficulties in age group determination of older specimens. After appropriate discussion with the specialists responsible for ageing, the age reading was repeated and the new abundance and average weight estimates were calculated based on these new results. The dataset from the year 2009 of the tuning fleet index (Annex 5, Table 5) has been corrected accordingly.

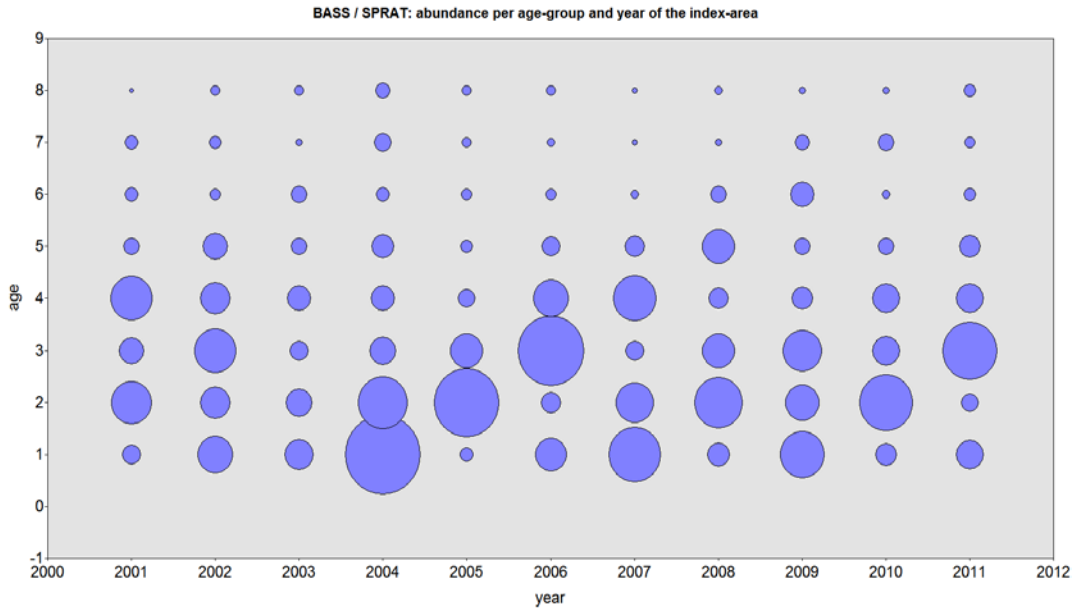


Figure 3.2.2.1.1. Spring (BASS) tuning fleet index (abundance per age groups and years) for sprat in the ICES Subdivisions 24, 25, 26 and 28.

Tuning Fleets for WGBFAS

The complete time-series (2001 to 2011) of the area-corrected sprat abundance in the ICES Subdivisions 24, 25, 26 and 28 (without Gulf of Riga) is given in Annex 5; Table 5 and in Figure 3.2.2.1.1. The ICES Subdivision 27 was not sufficiently covered and therefore the results from SD 27 should not be applied for the index calculation.

3.2.3 Recommendation to WGBFAS

i) WGBIFS recommends that, the BASS-dataset with new calculated values of 2009 and the valid data of 2011 can be used in the assessment of the sprat stock in the Baltic Sea.

Table 3.2.1.1. Estimated abundance (millions) of sprat in May 2011, per age groups and the ICES rectangles.

SD	RECT	Total	age 1	age 2	age 3	age 4	age 5	age 6	age 7	age 8+
24	38G2	330,49	111,96	18,03	112,15	48,59	19,91	8,00	7,19	4,66
24	38G3	1 211,38	504,35	69,37	393,50	145,89	47,80	21,81	19,03	9,63
24	38G4	2 331,36	107,35	194,87	1 142,64	502,91	183,46	81,09	87,16	31,88
24	39G2	155,02	29,82	10,05	61,92	28,65	12,46	4,88	4,27	2,97
24	39G3	1 169,98	133,62	101,78	561,69	217,69	77,44	31,56	30,38	15,82
24	39G4	350,76	21,46	31,89	181,58	69,22	22,21	9,92	10,45	4,03
25	37G5	1 703,75	26,10	123,97	1 219,37	184,03	86,17	7,45	29,57	27,09
25	38G5	3 579,98	63,42	255,07	2 471,19	427,17	220,77	24,09	62,39	55,88
25	38G6	3 957,23	92,98	245,38	2 809,01	437,22	208,88	20,65	75,00	68,11
25	39G4	225,32	28,92	12,70	129,40	28,13	15,57	3,20	4,17	3,23
25	39G5	4 101,31	164,45	210,11	2 390,82	665,28	390,03	104,90	102,86	72,86
25	39G6	1 730,24	42,92	120,34	1 249,07	175,99	80,52	6,64	28,44	26,32
25	39G7	1 043,95	65,90	72,08	680,63	119,03	64,40	8,40	17,98	15,53
25	40G4	789,92	33,43	44,27	461,66	126,23	69,56	16,55	21,54	16,68
25	40G5	2 646,93	62,29	161,51	1 693,37	376,02	210,27	47,69	54,65	41,13
25	40G6	9 589,83	63,57	604,51	6 624,64	1 206,18	602,03	103,99	208,35	176,56
25	40G7	3 077,68	86,70	198,75	2 095,58	368,24	197,32	23,10	57,46	50,53
25	41G6	1 971,83	11,85	121,19	1 392,06	236,46	117,07	19,18	39,97	34,05
25	41G7	1 528,43	77,87	111,10	1 069,39	150,60	72,32	7,22	21,03	18,90
26	39G8	532,35	5,40	3,78	357,99	84,90	50,03	21,88	8,03	0,34
26	40G8	473,85	3,17	3,11	320,76	76,29	44,15	20,18	6,19	
26	40G9	5 500,61	572,41	55,58	932,73	1 353,23	1 195,62	913,38	259,56	218,10
26	40H0	4 988,30	3172,58	162,97	729,61	479,75	205,32	141,08	41,93	55,06
26	41G8	5 104,62	163,58	59,38	3 381,06	781,74	453,04	197,98	65,53	2,31
26	41G9	3 763,88	199,29	403,57	2 340,12	215,68	278,15	111,13	48,98	166,96
26	41H0	1 790,42	145,55	119,24	1 048,10	189,99	141,51	50,64	21,09	74,30
28A	42G8	1 608,07	25,22	20,64	906,37	322,76	167,97	108,93	6,88	49,30
28A	42G9	3 034,45	79,25	35,74	1 672,89	608,52	317,40	201,75	22,25	96,65
28A	42H0	6 147,41	276,70	507,87	3 320,28	932,42	637,09		162,91	310,14
28A	43G9	3 451,35	446,48	68,29	1 847,06	537,00	259,04	174,05	14,61	104,82
28A	43H0	5 625,75	1040,84	496,55	2 710,11	518,25	368,57	117,08	186,88	187,47
28A	43H1	1 720,78	355,60	167,49	789,48	176,22	91,71	31,82	59,92	48,54
28A	44G9	2 147,32	237,35	58,76	1 178,11	336,60	162,04	106,72	7,83	59,91
28A	44H0	4 553,40	898,08	217,93	2 347,08	392,92	250,33	81,55	107,64	257,87
28A	44H1	1 735,37	686,62	101,12	550,45	133,47	186,41	18,40	10,21	48,69
28A	45G9	2 046,69	222,59	65,36	1 114,03	317,01	158,26	100,77	7,18	61,49
28A	45H0	4 747,43	816,06	200,06	2 547,14	427,05	136,44	171,91	107,61	341,16
28A	45H1	9 507,56	4010,30	507,67	2 973,93	720,95	1 045,38	45,06		204,27

Table 3.2.2.1. Estimated numbers of sprat (millions) by the ICES Subdivisions, according to age groups (May 2011).

SD	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
24	908,56	425,99	2 453,48	1 012,95	363,28	157,26	158,48	68,99
25	820,40	2 280,98	24 286,19	4 500,58	2 334,91	393,06	723,41	606,87
26	4 261,98	807,63	9 110,37	3 181,58	2 367,82	1 456,27	451,31	517,07
28A	9 095,09	2 447,48	21 956,93	5 423,17	3 780,64	1 158,04	693,92	1 770,31

Table 3.2.2.2. Area corrected numbers (millions) of sprat by the ICES Subdivisions and age groups (May 2011).

Sub-div.	AREA_CORR_ FACTOR	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
24	1,28	1 161,93	544,79	3 137,68	1 295,43	464,59	201,12	202,68	88,23
25	1,07	881,62	2 451,20	26 098,58	4 836,44	2 509,16	422,39	777,40	652,16
26	1,54	6 576,87	1 246,29	14 058,67	4 909,65	3 653,90	2 247,24	696,44	797,92
28A	1,10	10 027,00	2 698,26	24 206,70	5 978,84	4 168,02	1 276,70	765,02	1 951,70

Table 3.2.1.3. Corrected sprat biomass (in tonnes) according to the ICES Subdivisions and age groups (May 2011).

Sub-div.	AREA_CORR_ FACTOR	age 1	age 2	age 3	age 4	age 5	age 6	age 7	age 8+
24	1,28	6 827,63	7 237,00	42 453,43	19 692,37	7 933,08	4 146,70	3 106,35	1 642,51
25	1,07	4 991,96	24 384,05	272 953,74	59 451,87	32 253,29	6 877,32	9 770,71	7 920,90
26	1,54	22 607,90	9 695,06	128 271,50	47 465,48	37 999,78	36 287,90	7 971,76	9 038,69
28A	1,10	37 540,08	20 431,75	208 194,86	57 993,76	41 702,81	14 127,29	7 620,83	19 307,88

4 Update the acoustic database BAD1 and FishFrame

4.1 Update of the Access-Databases BASS_DB.mdb and BIAS_DB.mdb

Until 2009, the results of the acoustic surveys aggregated by the ICES-rectangle were stored as Excel data sheets (BAD1). In 2010, these data tables were transformed in a more database-oriented structure and transferred in Access-Databases. Since that time, the data of the **Baltic Acoustic Spring Survey (BASS)** are stored in the **BASS_DB.mdb**. The data of **the Baltic International Acoustic Survey (BIAS)** are stored in the **BIAS_DB.mdb**.

These Access-files also include queries with the used algorithms for creation of the report tables and the calculation of the different tuning fleets.

The data from the year 2011, after validation, were added to both databases. Additionally the survey-table of the **BIAS_DB** was extended by a field for the percentage of cod of the estimated total number of individuals and supplemented with data of 2005–2011.

The current versions of the databases are located on the folder "Data" of the WGBIFS-SharePoint (https://groupnet.ices.dk/wgbifs2012/Data/Forms/AllItems.aspx).

As the result of discussion on the current meeting (WGBIFS 2012), the structure of the BIAS database should be adapted by manager of this records (Uwe Böttcher) to allow the incorporation of the estimates of two herring stocks (Western Baltic Spring Spawner and Central Baltic Herring) by the ICES Subdivisions (see Chapter 14).

4.2 Status of the FishFrame database regarding acoustic data

Acoustic survey data can be uploaded in version 4.3 of the FishFrame database, but not into ver. 5.0. Version 4.3 is based on outdated technology, which means that no further development will be done to this version. Unfortunately, as this version was primary developed for the North Sea acoustic data, this means that the functionality is far from optimal for the Baltic Sea acoustic data and that the necessary adjustment of settings to Baltic data will not be done. One of the consequences is that the files made for upload of Baltic data are too big to be coped with by ver. 4.3. Therefore, the files must be split in two and uploaded separately, which gives some over-writing problems. Another consequence is that the reporting module is not compatible with newer versions of Microsoft Office, which means that no reports are available at present.

Recently the uncertainty expressed by WGBFAS in connection with the calculation of stock assessment indices due to variable vertical distribution of cod in the pelagic zone that has suggested new analysis based on combination of trawl survey and S_A values from acoustic surveys. A routine compilation of the acoustic data (see section ref) requires that data are available in a common database. Therefore, the group once again strongly recommends that RDB-FishFrame should be developed to include acoustic data.

5 Plans, decisions and experiments to be conducted in 2012 and 2013 acoustic surveys

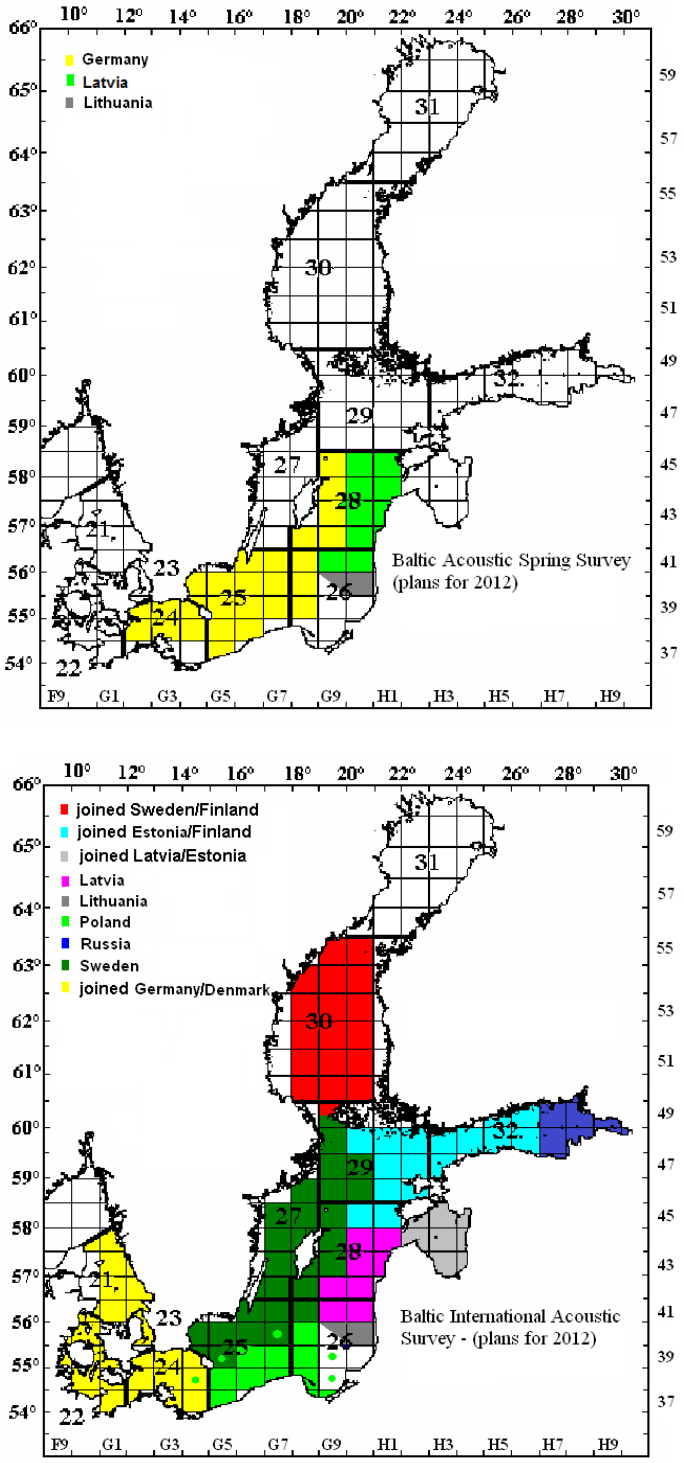
5.1 Planned acoustic survey activities

All the Baltic Sea countries intend to take part in acoustic surveys and experiments in 2012 (Figures 5.1.1 and 5.1.2). The list of participating research vessels and initially planned periods of particular surveys are given in the following table:

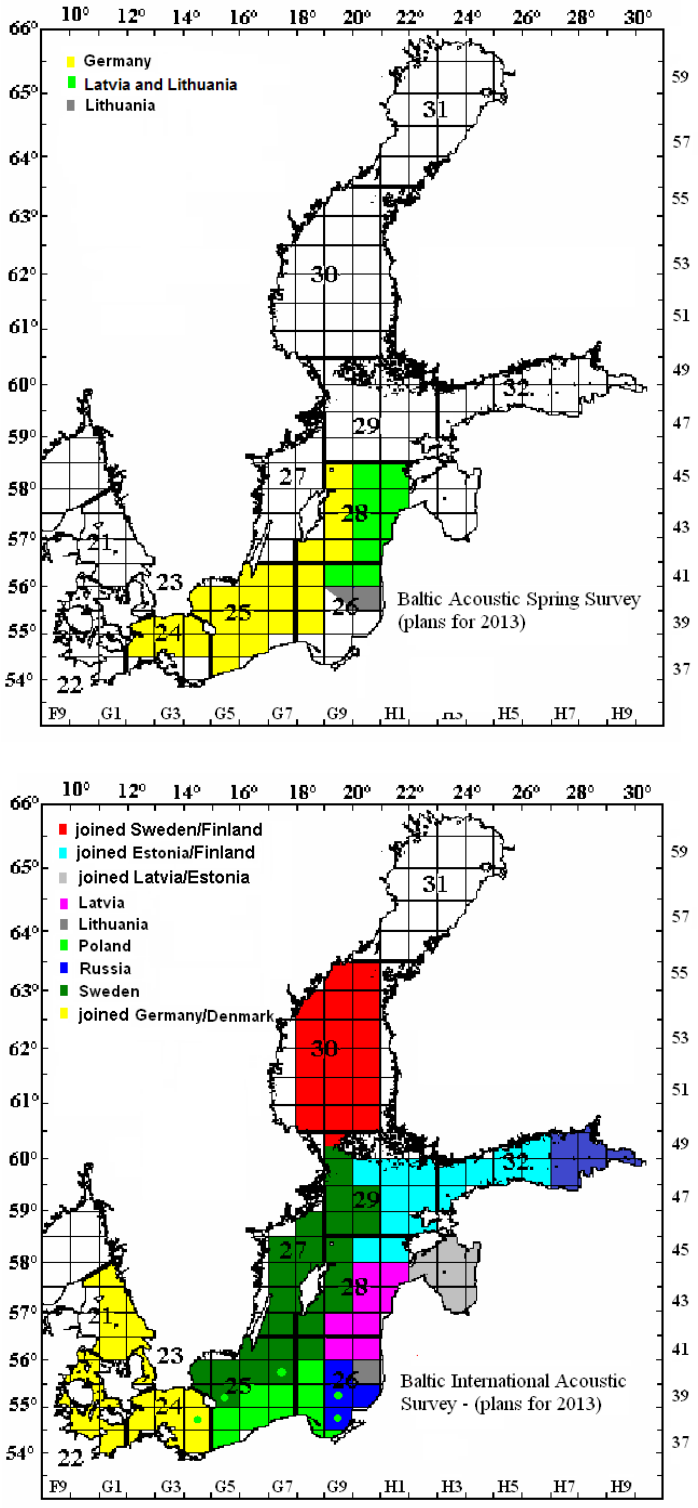
Vessel	Country	Area of investigation (ICES Subdivisions)	(Preliminary) period of investigations	Duration (days)
BALTICA	Poland	24 (part), 25, 26	17.09.–01.10.2012	15
BALTICA	Latvia, Poland	26 (N), 28	11–20.10.2012	10
BALTICA	Estonia, Finland, Poland	28 (part), 29 (N), 32 (W)	21.10.–01.11.2012	12
CHARTER	Latvia, Estonia	28 (Gulf of Riga)	30.07.–08.08.2012	10
DANA	Sweden	25 (N), 27, 28 (W), 29 (W)	06–28.10.2012	23
DANA	Sweden, Finland	30	02–05.10.2012	4
DARIUS	Lithuania	26 (the Lithuanian EEZ)	May	2
DARIUS	Lithuania	26 (the Lithuanian EEZ)	October	2
DARIUS	Latvia	26 (N), 28	May	10
Fishing trawler type MRTK	Russia	32 (E)	21–30.10.2012	4
SOLEA	Germany, Denmark	21, 22, 23, 24	01–20.10.2012	20
WALTHER HERWIG III	Germany	24, 25, 26 (part), 28 (part)	02–22.05.2012	21

The preliminary plan for acoustic surveys and experiments in 2013 (Figures 5.1.3 and 5.1.4) for majority of institutes is presented in the text table below however, the final outline of plans will be available after verification of budgets.

Vessel	Country	Area of investigation (ICES SubDivisions)	(Preliminary) period of investigations	Duration (days)
ARANDA	(Sweden), Finland	30	October	8
BALTICA	Poland	24 (part), 25, 26	September/October	15
BALTICA	Latvia/Poland	26 (W), 28	October	10
BALTICA	Estonia, Finland, Poland	28 (part), 29 (N), 32 (W)	October	12
CHARTER	Latvia, Estonia	28 (Gulf of Riga)	July – August	10
DANA	Sweden	25 (N), 27, 28 (W), 29(W)	October	23
DARIUS	Latvia	26N, 28	May	10
DARIUS	Lithuania	26 (Lithuanian EEZ)	May	2
DARIUS	Lithuania	26 (Lithuanian EEZ)	October	2
Fishing trawler type MRTK	Russia	32 (E)	October	4
SOLEA	Germany	24, 25, 26 (part), 28 (part)	May	21
SOLEA	Germany/Denmark	21, 22, 23, 24	October	20
ATLANTNIRO/ATLANTIDA	Russia	26 (part)	October	15



Figures 5.1.1–5.1.2. The planned coverage of the Baltic Sea and the assignment of the national/joint acoustic surveys to the rectangles during the May and the September/October surveys in 2012 (from top to bottom). Base colours of rectangles indicate the country or joint survey, which is responsible for this ICES-rectangle. Coloured dots indicate overlapping coverage by other countries (sometimes only parts of rectangle are covered).



Figures 5.1.3–5.1.4. Proposed preliminary partitioning (assignment of the national/joint surveys to rectangles) for the May and the September/October surveys in 2013 (from top to bottom). Base colours of rectangles indicate the country or joint survey, which is responsible for this ICES-rectangle. Coloured dots indicate overlapping coverage by other countries (sometime only parts of rectangle are covered).

5.1.1 Planned acoustic survey activities in the eastern part of the Gulf of Finland

According to the proposal of the GosNIORH - St Petersburg, they will carry out the BIAS survey in October 2012 on the Russian commercial vessel, inside the Russian EEZ (ICES SD 32; see ICES CM 2011/SSGESST:05).

The WGBIFS welcomed the idea since this would allow the full coverage of the Gulf of Finland with the acoustic and control-hauls monitoring, which is one of the most productive herring fishing ground in the Baltic Sea. The WGBIFS reiterated its 2011 proposal that the best way to incorporate the Russia would be the prolongation of the present EST-FIN-POL survey by around 3–4 days. This would allow covering the full area (SD 32) with same methodology and equipment settings, in order to avoid the additional time and expenses consuming for inter-calibration.

The WGBIFS also suggested that the new coverage scheme of BIAS, including the Russian EEZ in Subdivision 32, would only functioning if the formal permission for operating vessel with the research works inside the Russian EEZ will be granted in due time.

5.2 Data delivery and analysis

The main results of both types of international acoustic surveys (BIAS, BASS), carried out in 2012, should be summarized in table format according the Manual for the International Baltic Acoustic Surveys (Addendum 2) and uploaded latest one month before the WGBIFS meeting of the next year to the current data folder of the ICES-SharePoint of WGBIFS 2013.

Before the meeting of WGBIFS the data must be integrated into the database by the database manager. The integrated data are checked for errors and preliminary analysis will be performed in order to present the data to the meeting for further evaluations and discussion. If the countries do not send the data to database manager in the agreed time, this work cannot be done with the required quality during the meeting.

The inclusion of the data, which are not delivered by agreed deadline before the meeting, into the relevant evaluation/tuning index calculation, is considered by WGBIFS only in exceptional cases. Such case concerned the Russian BIAS survey data from October 2011, which were delivered in the second day of WGBIFS 2012 meeting.

5.3 Recommendations

i) Sweden and Baltic RCM will to advocate that in 2013, Sweden will start participating to the BASS survey, covering at least the ICES Subdivision 27;

ii) Russia is strongly requested to participate in the BIAS and BASS surveys in 2012–2013 covering the southeastern part of the ICES Subdivision 26;

iii) in 2012 and forthcoming years, the BIAS area will be extended to the Russian EEZ in the ICES Subdivision 32, and the Russian GosNIORH (St. Petersburg) will be managing this surveys;

iv) the database of the BASS, transferred in Access-Databases, including valid data from the year 2011, will be stored in the BASS_DB.mdb, and the data of the BIAS (incl. 2011 data) - in the BIAS_DB.mdb; these Access-files also include queries with the used algorithms for creation of the report tables and the calculation of the different tuning fleets; additionally

the survey-table of the BIAS_DB was extended by a field for the percentage of cod of the estimated total number of individuals and supplemented with data of 2005–2011;

v) The structure of the BIAS database should be adapted by manager of database (Uwe Böttcher, Germany) to allow the incorporation of the estimates of two herring stocks (Western Baltic Spring-spawning Herring and Central Baltic Herring) by the ICES Subdivisions.

6 Discuss the results from BITS surveys performed in autumn 2011 and spring 2012

6.1 BITS 4th quarter 2011*

During quarter 4th BITS in 2011, the level of realized valid hauls represented 88% of the planned stations (Table 6.1.1). This level of valid hauls was considered by WGBIFS as appropriate for tuning series and is recommended for the assessment of Baltic cod stocks.

Higher level of valid hauls was obtained in the ICES Subdivisions 22–24 (100%) compared to ICES Subdivisions 25–29 (82%). Lower level of valid stations in Eastern Baltic Sea can be explained by bad weather conditions during the Lithuanian, Latvian and Estonian surveys. The weather conditions during Lithuanian and Latvian surveys results in 63% and 76% of the planned number, respectively. Level of valid hauls was the lowest and amounted to 65% in ICES Subdivision 26, while in the other Subdivisions of the Eastern Baltic Sea the level exceeded 86%.

All planned station in the Baltic Sea with a depth of less than 40 m were realized. 82%, 96%, 76% and 56% of planned stations were conducted in depth strata 2, 3, 4 and 5, respectively.

Table 6.1.1. Comparison of the planned and realized fishing stations by the ICES Subdivisions and depth layers during BITS 4th quarter 2011.

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–6)	Number of hauls planned	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
22	TVS	1	8	8	-	-	-	-	100
24	TVS	1	8	8	-	-	-	-	100
24	TVS	2	16	16	-	-	-	-	100
24	TVS	3	26	26	-	-	-	-	100
25	TVL	1	13	12	-	-	3	1	85
25	TVL	2	12	11	-	-	3	-	92
25	TVL	3	3	2	-	1	-	-	67
26	TVL, TVS	1	8	7	1	-	1	-	100
26	TVL, TVS	2	11	5	2	-	1	3	36
26	TVL, TVS	3	12	10	2	1	-	1	92
26	TVL, TVS	4	12	6	2	3	2	1	58
26	TVL	5	6	-	2	2	-	-	33
27	TVL	2	2	2	-	-	-	-	100
27	TVL	3	4	4	-	2	-	-	100
27	TVL	4	1	1	-	1	-	-	100
27	TVL	5	3	3	-	3	-	-	100
28	TVL	1	4	3	2	-	-	-	125
28	TVS, TVL	2	6	2	2	-	1	-	67
28	TVS, TVL	3	5	4	2	-	-	-	100
28	TVS, TVL	4	11	6	5	6	-	-	150
29	TVS	1	1	1	-	-	-	-	100
29	TVS	2	2	3	-	-	-	-	150
29	TVS	4	1	0	-	-	-	-	0

* Danish data not included.

6.2 BITS 1th quarter 2012

The level of realized valid hauls in relation to the planned hauls was relatively similar to the 4th BITS in 2011 with 100% in ICES Subdivision 22–24 and 87% in the ICES Subdivisions 25–28 (Table 6.2.1). Russia did not realize the planned stations in the ICES Subdivisions 25 and 26 which results in a proportion of 95% and 58% of realized stations, respectively. The fraction of valid hauls in SD 26 was high in depth strata 1, 2, 3 and 4 with 100%, 79%, 89% and 80% but very low in depth strata 5 and 6 with 33% and 0%, respectively due to missing Russian stations. However, instead of Russia a few planned catch-stations in the ICES Subdivisions 25 and 26 were accomplished by Poland and Denmark. Although Russia did not participate in BITS in quarter 1 in 2012 *WGBIFS recommends that the results can be used in the stock assessment without any restrictions.*

Table 6.2.1. Comparison of the planned and realized fishing stations by the ICES Subdivisions and depth layers during BITS 1st quarter 2012*).

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–6)	Number of hauls planned	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
22	TVS	1	6	6	-	-	-	-	100
24	TVS	2	24	24	-	-	-	-	100
24	TVS	3	27	27	-	-	-	-	100
25	TVL	1	19	18	-	-	-	1	89
25	TVL	2	34	36	-	-	1	2	100
25	TVL	3	41	37	-	-	3	1	88
25	TVL	4	14	12	-	-	1	-	86
26	TVL	1	7	7	-	-	-	-	100
26	TVL, TVS	2	14	11	-	-	-		79
26	TVL, TVS	3	18	13	3	1	1	-	89
26	TVL, TVS	4	5	4	1	1		1	80
26	TVL	5	9	1	2	3	-	-	33
26	TVL	6	14	-	-	-	-	-	0
27	TVL	2	2	2	-	-	-	-	100
27	TVL	3	4	4	-	-	-	-	100
27	TVL	4	1	1	-	1	-	-	100
27	TVL	5	3	3	-	3	-	-	100
28	TVL	1	4	1	3	-	-	-	100
28	TVL	2	10	3	6	-	1	-	90
28	TVL	3	9	4	6	1	-	-	111
28	TVL	4	10	4	6	5	1	1	100

Standard reports giving overviews of the result of 1st and 4th quarter surveys from each country can be found in Annex 6. More detailed descriptions of most of the individual surveys can be found in Annex 7.

7 Plan and decide on demersal trawl surveys (BITS) and experiments to be conducted in autumn 2012 and spring 2013

The procedure which is used for allocating stations to the ICES Subdivisions and depth layers is described in Annex 3 "Method used for planning the Baltic International Trawl Survey" of the WGBIFS report in 2004. The DATRAS Database (version from March 2010) was used to estimate the 5 years - running means of distribution pattern of both cod stocks by depth layer and the ICES Subdivision. The running mean of spring BITS indices of age-group 1+ of cod from 2007–2011 was used based on the current used version of conversion factors which are stored in the DATRAS system.

The most of the participating institutes plan the same numbers of hauls during BITS surveys in autumn 2012 and spring 2013 as in the years before. Small variations did not lead to a significantly change of the total number of stations by surveys. The stable total number of stations of the quarter 1 and 4 surveys gives the opportunity that most countries can realize the planned fishing stations within the own national economical zone. However, it must be pointed out that all countries should be able to work also in economical zones of other countries to fulfil the requirements of the international coordinated surveys.

The total number of available stations (Table 7.1) was used in the combination with the results of relative distribution of stations by the ICES Subdivision and depth layer (Tables 7.2 and 7.3) to allocate the number of total planned stations by the ICES Subdivision and depth layer for the different surveys. Tables 7.4 and 7.5 present the allocated hauls by the ICES Subdivision and the depth layer for autumn survey in 2012. Furthermore, the number of hauls to be carried out by countries in the different Subdivisions is given. Tables 7.6 and 7.7 show the data corresponding for the survey in spring 2013.

The planned stations by country and the ICES Subdivision are preliminary. It is possible that the number of stations can be slightly changed to minimize the total distance between the assigned hauls by country. Furthermore, it is required that hauls are planned within the national zones if possible (at least in the 12 nm zones) to reduce problems with national permissions.

Estonia is participating at the 4-quarter BITS survey, performing five trawl hauls in the Estonian EEZ of SD 28 only using the chartered commercial vessel. In order to charter the vessel the particular tendering rules applicable in Estonia should be followed. Due to that, the particular survey vessel will be known only very shortly before the planned survey which does not allow necessary period to apply for the permission for the working in foreign EEZ. Therefore, five stations are planned in SD 28.

WGBIFS notes that Russia has decided not to participate in the BITS survey in autumn 2012. Since other ICES Member Countries will not be able to get permission to work in the EEZ of Russia, the negative effect on the quality of the survey results of 2012 autumn BITS survey would be eminent. *Therefore, WGBIFS strongly recommends that Russia should reconsider its decision and perform its indispensable part of the 2012 BITS survey in the Russian EEZ, at least partially.*

Table 7.1. Total numbers of catch-stations planned by country during BITS in autumn 2012and spring 2013.

COUNTRY	VESSEL	NUMBER OF PLANNED STATIONS IN AUTUMN 2012	NUMBER PLANNED STATIONS IN SPRING 2013
Germany	Solea	57	60
Denmark	Havfisken	23	23
	Total 22+24	**80**	**83**
Denmark	Dana	50	50
Estonia	Commercial vessel	10	
Finland			
Latvia	Chartered vessel	25	25
Lithuania	Darius	8	8
Poland	Baltica	31	49
Russia	Atlantniro/Atlantida		33
Sweden	Dana?	30	50
	Total 22-28	**234**	**298**

Table 7.2. Basic data for allocating hauls for survey by the ICES Subdivisions.

ICES Subdiv.	Total area of the depth layer 10-120 m [nm²]	Proportion of the SD (weight=0.6) [%]	Running mean of the cpue value of age-groups 1+ (2007 - 2011)	Proportion of the index values (weight=0.4) [%]	Proportion of the stations [%]	Special decisions (additional stations)
22	3673	39	237	23	33	
23	0	0	0	0	0	3
24	5724	61	792	77	67	
Total	**9397**	**100**	**1029**	**100**	**100**	
25	13762	43	1280	64	51	
26	9879	31	655	33	32	
27	0	0	0	0	0	10
28	8516	26	64	3	17	
Total	**32156**	**100**	**2000**	**100**	**100**	

Table 7.3. Basic data for allocating hauls according to depth layer for survey by the ICES Subdivisions.

ICES Sub-div.	Depth layer [m]	Total area of the depth layer [nm²]	Proportion of the depth layer (0.6) [%]	Running mean of the cpue value of age-group 1+ (2007 – 2011)	Proportion of the depth layer (0.4) [%]	Proportion of the depth layer [%]
24	10 – 39	4174	73	397	14	49
	40 – 59	1550	27	950	34	30
	60 – 79	29	1	1465	52	21
	Total	**5753**	**100**	**2812**	**100**	**100**
25	10 – 39	4532	37	279	6	24
	40 – 59	3254	26	1449	30	28
	60 – 79	3037	25	2100	43	32
	80 –	1461	12	1039	21	16
	Total	**12284**	**100**	**4867**	**100**	**100**
26	10 – 39	2379	23	178	7	17
	40 – 59	1519	15	843	31	21
	60 – 79	1911	19	722	27	22
	80 – 100	2872	28	707	26	27
	100 – 120	1504	15	251	9	13
	Total	**10185**	**101**	**2701**	**100**	**100**
27	10 – 39	1642	31	0	0	18
	40 – 59	1101	21	12	11	17
	60 – 79	996	19	99	89	47
	80 -	1596	30	1	1	18
	Total	**5335**	**100**	**112**	**100**	**100**
28	10 – 39	2589	39	4	2	24
	40 – 59	1598	24	42	21	23
	60 – 79	1101	16	104	51	30
	80 – 100	1389	21	55	27	23
	Total	**6677**	**100**	**205**	**100**	**100**

Table 7.4. Allocation of planned catch-stations by countries and the ICES Subdivisions in autumn 2012.

		Subdivision						
Country	**Total**	**22**	**23**	**24**	**25**	**26**	**27**	**28**
Denmark	73	20	3		44	6		
Estonia	5							5
Finland	0							
Germany	57	5		52				
Latvia	25					15		10
Lithuania	8					8		
Poland	31				20	11		
Russia	0							
Sweden	30				7	4	10	9
Total	229	25	3	52	71	44	10	24

Table 7.5. Allocation of planned catch-stations by the ICES Subdivisions and depth layers in autumn 2012.

Sub-div.	22	23	24	25	26	27	28
Depth layer [m]							
10 – 39	25	3	26	17	7	3	6
40 – 59			15	20	9	2	5
60 – 79			11	23	10	2	7
80 – 100				11	12	3	6
100 – 120					6		
Total	**25**	**3**	**52**	**71**	**44**	**10**	**24**

Table 7.6. Allocation of planned catch-stations by countries and the ICES Subdivisions in spring 2013.

		SUBDIVISION						
COUNTRY	TOTAL	22	23	24	25	26	27	28
Denmark	73	20	3		44	6		
Estonia	0							
Finland	0							
Germany	60	6		54				
Latvia	25					15		10
Lithuania	8					8		
Poland	49				30	19		
Russia	33				20	13		
Sweden	50				11	4	10	25
Total	298	26	3	54	105	65	10	35

Table 7.7. Allocation of planned catch-stations by the ICES Subdivisions and depth layers in spring 2013.

Sub-div.	22	23	24	25	26	27	28
Depth layer [m]							
10 – 39	26	3	27	26	11	3	8
40 – 59			16	29	14	2	8
60 – 79			11	34	14	2	11
80 – 100				16	18	3	8
100 – 120					8		
Total	26	3	54	105	65	10	35

8 Update and correct the tow database

8.1 Reworking of the Tow Database

Feedbacks of the last surveys have demonstrated that the structure of the Tow Database is suitable for the routine use. Changes of the structure were not proposed and discussed. The current used structure was described in the report of the WG BIFS meeting in 2005 and in the BITS manual.

The feedbacks of the surveys in November 2011 and partly of the survey in spring 2012 were used to update the Tow Database. Some stations were deleted (stones, wrecks, area with munitions, …) or were corrected dependent on the information of the different countries (correction of depth, shift of the positions, etc.). New hauls were provided by the most countries in areas where the density of available stations was low. More than 90% of the stations which are stored in the Tow Database were already successfully used at least one time. On the other hand trawls were damaged at stations which were already successfully used at least one time. Those hauls were further used in the Tow Database, but the datasets are marked. The stations are deleted if similar problems were found during the next surveys.

Final version of the Tow Database was not available during the meeting because the feedback of the BITS in spring 2012 was not available before the meeting started. The missing feedback will be used immediately after submission by the countries. Then the version TD_2012V1.XLS will be made available for all countries. To speed up this process it is necessary that all countries submit the feedback according to the given description mentioned below immediately after the survey. The EXCEL file "Feedback.xls" will be provided for the standard reports.

8.2 Feedback of the BITS

Structure of feedback of the BITS was agreed two year ago. This structure should be used for reporting the information from the realized hauls. The aim of the structure is to make it as easy as possible to rework the Tow Database. The experiences of the last years made it necessary to explain some codes more detailed.

The following information of all realized stations of BITS should be submitted to Germany.

- New version of haul number for the Tow Database
- ICES Subdivision
- Start position (latitude, longitude)
- Mean depth
- Depth range
- TV3 version 1 – TV3#520, 2 – TV3#930
- Used groundrope 1 – standard groundrope, 2 – rock-hopper groundrope
- Code of the haul
- Reason for deleting the haul

Set of codes (see table below) for characterizing the different type of realization of hauls was defined.

Code		Case
A		The position and the mean depth are suitable. Small changes of the positions are possible as a result of weather condition, gillnets, …. Data of the Tow database must not be changed in these cases.
B	1	The position is suitable, depth must be corrected. Small differences of the water depth which not significantly influence the assignment of the haul to the depth layer and which probably are determined by the variability of the surface layer must not be marked by this code.
B	2	Depth is ok, position must be corrected (reason). This code must be used when the position must be permanent changed as a result of reasons which will not be changed in future
B	3	The required depth is not stable, new position is proposed with flat bottom
C		The position is not suitable and it should be deleted (reason)
D		New haul for the database

It was agreed that:

- The feedback of realized surveys should be submitted to Rainer Oeberst (rainer.oeberst@vti.bund.de), Germany using the proposed standard format not later than **20 December** (autumn survey) **and immediately after spring survey.**
- The standard groundrope must be used when the station was successfully carried out during earlier surveys with this gear (see the columns TV3 and groundrope in the TD).
- New haul positions should be submitted to Rainer Oeberst (rainer.oeberst@vti.bund.de), Germany as soon as possible. Especially, hauls in the "white areas" are necessary to cover the total distribution area of the target species. It was proposed that time should be used during surveys to allocate new haul positions in the "white areas".

EXCEL file was provided to the group which contains standard structure of feedback.

9 Review and update the Baltic International Trawl Survey (BITS) Manual

The Manual for the Baltic International Trawl Surveys (BITS) from the WGBIFS meeting in March 2011 was reviewed and some technical aspects regarding survey data submission to the DATRAS database were discussed. Any significant changes regarding methods of data collecting during BITS surveys were not proposed. The Manual reflecting the current methods to be used in the surveys is presented in Addendum 1.

However, following aspects concerning the BITS surveys realization and input data submission should be taken into account:

a) before the survey start should national BITS survey leaders together with experienced ship navigators carefully check all the proposed haul-locations (geographical positions and depths), allocated inside their own EEZ, to every vessel designated to survey realization, vs. various current navigational conditions, even when a particular haul-location was in the past recommended by users; it is suggested that the local BITS cruises leader will inform the Tow-Database manager Rainer Oeberst (rainer.oeberst@vti.bund.de), Germany about current status of accessibility of catch-stations,

b) it is strongly recommended not to change the fish species codes system within a year; the TSN codes still are valid and cannot be changed by the ICES DATRAS database manager without consultancies with the WGBIFS,

c) it is suggested that all countries should measure length and weight of all fish species during the BITS surveys and input data should be submitted to the DATRAS database,

d) the technical parameters of the standard fishing gear applied for BITS surveys should be checked once per year and obtained data should be reported in standard format to WGBIFS next meeting,

e) the information on fish maturity should be uploaded to the DATRAS database accordingly to the national scale applied, and next the ICES Secretariat Data manager will convert this data to needed scale level, however the table with proposed conversion data should be delivered by particular countries,

f) the information about marine litters (as one of the environment descriptors – see the Report from the joint MEDPOL/Blacksea/JRC/ICES Workshop on Marine Litters; WKMAL/2011), in relation to the Marine Strategy Framework Directive, is proposed to be noticed by the cruise leader during BITS surveys and the data will be transferred to the national correspondent – responsible for National Fisheries Data Collection Programme, and other scientific-body under requests.

10 Review and update the Manual for International Baltic Acoustics Surveys

Current review of the text of the IBAS manual (previously updated (BIAS) in 2011) as well as presentations and discussion during WGBIFS-2012 meeting indicated that some update and corrections are needed.

The manual was renamed because the abbreviation BIAS was described as an acoustic autumn survey in Baltic. Thus, the new name of the manual is "Manual for International Baltic Acoustics Surveys (IBAS)".

A new format of exchange data files is applied. This Excel spreadsheet was included ten sheets, which are presented in Table 6.1 (Addendum 2). An example of the file is available on the 2012-sharepoint folder "DATA" (acoustic survey data exchange file.xls). The new standard exchange format is recommended for the next survey documents preparation. The exchange Excel-sheets consists of the following ten tables:

SU	Description of the different surveys,
ST	Basic values for the computation of the abundance,
N_HerW	Number of herring (million) WBSSH per age group,
N_HerC	Number of herring (million) CBH per age group,
N_Spr	Number of sprat (millions) per age group,
N_Cod	Number of cod (millions) per age group,
W_HerW	Mean weight of herring (gram) WBSSH per age group,
W_HerC	Mean weight of herring (gram) CBH per age group,
W_Spr	Mean weight of sprat (gram) per age group,
W_cod	Mean weights of cod (gram) per age group.

The date of BAD1 database is not updated any more. The data of the Baltic Acoustic Spring Survey (BASS) are stored in the **BASS_DB.mdb**. The data of the Baltic International Acoustic Survey (BIAS) are stored in the **BIAS_DB.mdb**. Structures in BIAS and BASS database format is presented in Table 6.2 (Addendum 2).

The new approach for combining the results of trawling stations during the acoustic surveys was presented in WGBIFS meeting in 2012. This new method uses relationships between the s_A values of the target species and the s_A value of the total water column during the trawling stations. Thus, it's recommended that that s_A values from the total water column during trawling stations are started to collect as a standard process. In this circumstance, the trawling station is defined as a time between set and shut the gear.

In the case of two or more scattering layers are present in one area, it is recommended to sample all layers by same haul. That should be done by trawling first in the one layer and then shift the gear in the other layer. An equal trawling time in each layer should be carried out by excluding the time during the shift.

Annex 2: "Calibration procedures" was excluded from the manual. The calibration of the standard equipment used for the survey is recommended to do as described in "Simrad ER60 Scientific echosounder reference manual". The link to the latest version of the reference manual is presented.

The main results of the recently conducted acoustic surveys (BASS and BIAS) should be summarized and uploaded one month before the WGBIFS meeting of the next year to the data folder of the current WGBIFS-SharePoint. In addition, information about any changes in the planned acoustic transects pattern for given survey (vessel) as well as any difficulties concern the acoustic survey realization should immediately be transferred to the acoustic surveys coordinators within the WGBIFS, i.e. Niklas Larson, Lysekil – Sweden (niklas.larson@slu.se) and Uwe Boettcher, Rostock – Germany (uwe.boettcher@vti.bund.de), with copy to the WGBIFS chair.

11 Review of any new results on the vertical distribution of the Baltic cod

In 2008 the WG BIFS decided to carry out investigations concerning the vertical distribution of cod particularly in areas suffering of oxygen deficiencies (< 1.5 ml/l) at the bottom. The reason was that acoustic surveys have suggested that significant biomass of cod were situated in the pelagic in areas with low content of oxygen at the bottom (Schaber *et al*., 2008). Such biomass would not be taking into account calculating indices based on routine demersal trawling and could potentially create bias in the indices. Therefore, Sweden, Poland and Denmark agreed to conduct a number of hauls using pelagic trawls and obtain acoustic transects in areas where hydrographic information indicate oxygen deficiency at the bottom. Various methods were used dependent of possibilities available and technical constrains at the research vessels.

Due to the assumed capability of using the same type of doors for both bottom and pelagic trawls the Danish research vessel was assigned to carry out pelagic trawl whenever oxygen deficiency was detected at the bottom. The fishing depth was decided based on the echogram obtained by acoustic measure of the following haul track. Sweden dedicated few days during the following cruises for the project as well and did a number of acoustic and pelagic trawl stations in selected transect around the Bornholm Deep. Poland made two pelagic hauls in the Gdańsk Deep.

A number of Swedish results were presented in the following years supporting the initial hypothesis that the pelagic situated cod might have a significant influence on the value of the index value depending of the size of the area with oxygen deficiency. The Danish results were to some extent in contrast to the Swedish results as very few cod were verified through trawling in the pelagic. It was later realized that the rigging of the pelagic trawl was unsuitable for catching cod (and any other fish species for that matter) because of the doors used. There were no funds available for an extending the Danish cruise which would be the only possible way to carry out the experiments compromising the routine part of the cruise, Therefore, the experiments with the pelagic trawl was stopped. The strategy for the final conclusions was based on combined input from both the Swedish and the Danish method and without useful input from the Danish method the further investigations unfortunately had to be given up. There are no plans at present to resume the investigations.

Instead, it was investigated if acoustic data obtained during the German BASS and BIAS surveys could be used to estimate the mean and maximum number of cod per m^2 by year and ICES Subdivision. The method of estimation is given in Oeberst (2011) and estimated stock indices are given in Oeberst and Böttcher (2012, BASS) and Oeberst and Gröhsler (2012, BIAS). The sA values during the fishing station and the species composition were used to estimate the number of cod per m^2 for each station. The means of all station of SD and the maximum values are presented in Ta-

ble 11.1 and 11.2. The number of cod per m² is also estimated based of the trawl surveys taking into account the distance of the tow and the door spread as well as the horizontal opening of the TLV to estimate the covered area. Different levels of catch per hour in units of TVL were selected from BITS to estimate the number of cod per m² (Table 11.3).

Table 11.1. Estimates of the mean and the maximum density of the cod in number of individuals per m² based on the sA values during the fishing station and the species composition of the hauls by year and SD of BASS.

Year	SD	Mean number of individuals per m²	Maximum number of individuals per m²
2008	24	0.004	0.014
2008	25	0.011	0.055
2008	26	0.012	0.044
2008	27	0.002	0.006
2008	29	0.000	0.000
2009	24	0.002	0.007
2009	25	0.075	0.803
2009	26	0.019	0.044
2009	27	0.002	0.000
2009	28	0.002	0.009
2010	24	0.000	0.000
2010	25	0.014	0.063
2010	26	0.003	0.010
2010	28	0.001	0.040

The estimates based on acoustic surveys showed that the mean and the maximum number of individuals per m² strongly varied between the SD and from year-to-year. Highest mean and maximum density were found in SD 25 in 2009 with 0.075 and 0.803, respectively. The analyses showed that cod is low in the pelagic water in SD 24 and SD 27 to SD 29. Highest values (mean and maximum) were observed in SD 25 and 26 during BASS. Comparisons of the estimates based on BITS and BASS showed that the maximum density of cod in the pelagic is higher than the maximum value of BITS based on a catch of 8000 individuals per hour. The estimates based on BASS also suggest that the density of cod in the pelagic water can be very high during BASS which is realized short after quarter 1 BITS.

WGBIFS suggest that the estimates of cod in the pelagic water based on BASS should be extended in space (total SD 26) and in time (2001 to 2012) to provide a time-series for cod in the pelagic water.

The usability for the stock assessment of the new time-series must be evaluated before it is used.

Table 11.2. Estimates of the mean and the maximum density of the cod in number of individuals per m² based on the s_A values during the fishing station and the species composition of the hauls by year and SD of BIAS.

Year	SD	Mean number of individuals per m²	Maximum number of individuals per m²
2008	21	0.000	0.000
2008	22	0.002	0.008
2008	23	0.004	0.005
2008	24	0.007	0.021
2009	21	0.001	0.001
2009	22	0.001	0.002
2009	23	0.004	0.008
2009	24	0.003	0.009
2010	21	0.000	0.000
2010	22	0.003	0.010
2010	23	0.014	0.025
2010	24	0.011	0.060

Table 11.3. Estimated number of individuals per m² based on different cpue levels of TVL and the area based on the distance of the tow and the door spread and the horizontal opening of the TVL.

	Level of cod density in individuals per hour in units of TVL			
Number of cod per hour [TVL]	8000	6000	4000	2000
Velocity of the vessel [kn]	3	3	3	3
Distance of the tow[m]	5556	5556	5556	5556
Door spread [m]	80	80	80	80
Horizontal gear opening [m]	40	40	40	40
Covered area based on doors spread [m²]	444480	444480	444480	444480
Covered area based on horizontal gear opening [m²]	222240	222240	222240	222240
Individuals per m²based on door spread	0.018	0.0135	0.009	0.004
Individuals per m² based on horizontal gear opening	0.036	0.0270	0.018	0.009

11.1 References

Schaber *et al.,* Hydroacoustic resolution of small-scale vertical distribution of Baltic cod (*Gadus morhua* L.) – habitat choice and limits during spawning. Matthias Schaber, Hans-Harald Hinrichsen, Stefan Neuenfeldt and Rüdiger Voss, WGBIFS report 2009.

12 Discuss the indices of acoustic surveys based on different methods for combining the data of fishing stations in compilation of acoustic indices and draft recommendations as appropriate

Acoustic surveys are widely used for estimating stock indices of pelagic species like herring, sprat, squid, krill as well as for nekton and plankton. Acoustic estimates are also used to improve the assessments based on trawl surveys. Data-driven approaches were used to interpret acoustic measurements between bottom-trawl stations by Neville *et al.* (2004) who used artificial neuronal networks, and by Mackinson *et al.* (2005) who applied fuzzy logical relationships. Technical and methodical aspects of fishery acoustics were summarized by Simmonds and MacLennan (2005). Kimura and Somerton (2006) condensed statistical aspects of trawl and acoustic surveys with special regard for the acoustic transects.

An important issue of the acoustic surveys is to assign the backscattering energy to species detected by acoustic signals, especially if the composition of species and their acoustic characteristics are highly variable. Trawling stations are commonly used to estimate species composition of the scattered target. However, results of trawling stations only present the relative distribution of targets, because only a part of the total area recorded by the acoustic signal is covered by the gear. Furthermore, the results of trawling stations are influenced by selectivity of the gear and possible avoidance of the targets.

The echo integrals can partition to the species level via reference to the composition of the trawling stations (Nakken and Dommasnes, 1975). However, statistical models concerning the combination of the results of trawling stations are not available yet. Three methods were proposed by Simmonds and MacLennan (2005) for combining the results of trawling stations in which the station results are combined with different weighting factors. The weight which is given to each sample is varied depending on the characteristics of the concentration sampled by the trawling gear. The following weighting methods were applied: a) weight is equal to the proportion in each catch, b) weight is equal to each catch-rate and c) echo integrals observed in the vicinity of the trawl stations are used as weight. Simmonds and MacLennan (2005) recommended method b) as most generally applicable.

During the last meeting of WGBIFS in 2011 new method was presented to combine the results of fishing stations where the relations between the s_A values of the species during the fishing station were taken into account to provide unbiased stock indices. The new method was applied for German data sampled during BASS in SD 25 from 2008 to 2010. The analyses were extended to all SD which were covered during German BASS of the same period (SD 24 to SD 29). In addition, data of German BIAS in SD 21 to SD 24 between 2008 and 2010 were analysed (see working documents Oeberst and Böttcher, 2012 and Oeberst and Gröhsler, 2012).

The studies clearly showed that the requirements of the standard method for combining the results of the fishing station by mean of arithmetic mean were not fulfilled during BASS in all investigated SD's. Figure 12.1 clearly shows that high s_A values during the fishing stations are only determined by sprat age group 2+. Therefore, the group supports the proposals that Germany extend the time-series stock indices based on the new method for BASS from 2001 to 2012. In addition, all other participants of BASS will provide stock indices based on the new method, too. Detailed

description of the calculation procedure and an example will be provided by Germany to support the work of the other countries. It is proposed to summarize the estimates of all participating countries to provide common estimates by ICES Subdivisions where the areas is covered by vessels of different countries for providing a time-series for the total are.

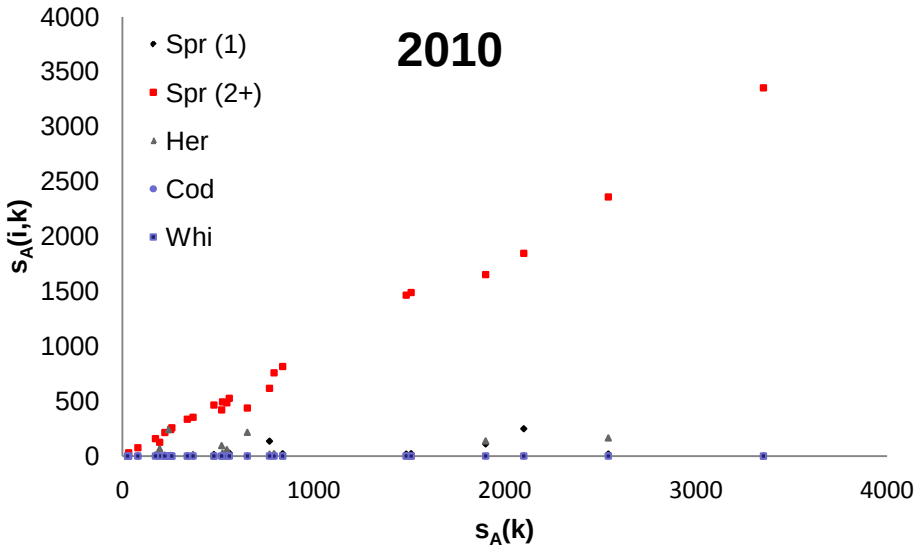


Figure 12.1. Relation between the s_A values of target types, i, $s_A(i,k)$ and total s_A value, $s_A(k)$, during the fishing stations, k, of German BASS in SD 25 2010 for the target types Spr(1): age group 1 of sprat, Spr(2+): age group 2+ of sprat, Her: total herring, Cod: total cod and Whi: total whiting.

The results of BIAS did not show the same clear relation between the s_A values of the species during the fishing station. Figure 12.2 shows the relation between s_A values during the fishing station ($s_A(k)$) and the s_A values of the species ($s_A(i,k)$) during German BIAS in SD 24 in 2010. High $s_A(i,k)$ of herring, sprat age group 0 and sprat age group 1+ were observed at different station. Possible reasons for the high variability should be analyses until the next meeting. Independent of this result, the time-series should also be extended to the period 2001 to 2012. All other participants of BIAS will start the application the new method for its own data and will provide the results during the next meeting. The work will also be supported by Germany.

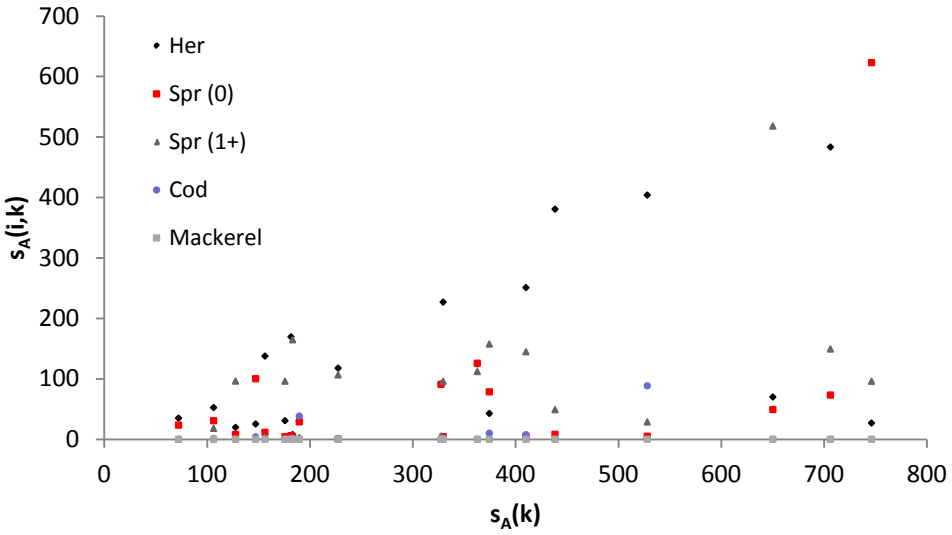


Figure 12.2. Relation between the s_A values of target types, i, $s_A(i,k)$ and total s_A value, $s_A(k)$, during the fishing stations, k, of German BIAS in SD 24 2010 for the target types Spr(0): age group 0 of sprat, Spr(1+): age group 1+ of sprat, Her: total herring, Cod: total cod and mackerel.

Addition advantage of the new method which uses the ICES Subdivision as one unit is the possibility to estimate confidence intervals of the stock indices by means of bootstrap methods. The analyses and the discussion during the meeting clearly showed that a database of acoustic data which contain all source data are necessary to improve the usability of the data for the stock assessment and to open the data for new analyses like the estimation of cod in the pelagic water which is required to qualify the stock indices of cod based on BITS.

12.1 Recommendation

The group recommends that the new method for combining the results of fishing station will be applied for the time-series of BASS and BIAS from 2001 to 2012 to estimates stock indices of herring and sprat. The new analyses will provide also a time-series of cod in the pelagic water during BASS and BIAS for supporting the estimation of the cod stock based on the BITS.

12.2 References

Oeberst, R., Böttcher, U. 2012. Indices of sprat and herring based on German acoustic survey in May (BASS) – estimated with different methods for combining the results of fishing stations. Working document of WGBIFS in Helsinki, Finland, 14 pp.

Oeberst, R., Gröhsler, T. 2012. Indices of sprat and herring based on German acoustic survey in October (BIASS) – estimated with different methods for combining the results of fishing stations. Working document of WGBIFS in Helsinki, Finland, 13 pp.

13 Evaluation of the new uncertainty estimates for the BIAS abundance indices derived from a simulation model

Kasastkina and Gasyukov showed that the variance of the stock indices is highly correlated with the stock index based on the results of the acoustic surveys during the WGBIFS meeting in 2011. The statistical characteristics of fish abundance indices were obtained by processing the BIAS data from 2004–2006 using the simulation method (Kasatkina and Gasyukov, 2006, 2009). The need for accuracy estimation of acoustic abundance indices and further integration of this information into the Baltic fish stock assessment models was discussed by the group members. Such studies which have high potential to improve the stock assessment of sprat and herring in the Baltic Sea require the availability of acoustic database which contains all source data (acoustic and biological data). Preliminary version of such a database was developed within FishFrame, but until now this database is not fully implemented and usable.

No new uncertainty estimates for the BIAS abundance indices derived from a simulation model was presented during the WGBIFS meeting in 2012, but the possibilities to estimate the survey sampling variance (recommendation by WGMG) were discussed (see Chapter 17.7).

13.1 References

Kasatkina, S. M., Gasyukov, P. G. 2006. Estimating uncertainty in the Baltic acoustic survey results applying geostatistics techniques and simulation //ICES Annual Science Conference, Maastricht, Netherlands, 17–26 September 2006. ICES Document CM 2006/I: 14. 2006. 17p.

Kasatkina, S. M., Gasyukov, P. G. 2009. Quality of abundance indices based on international acoustic surveys in context of input data for stock-assessment models: example of Baltic International Acoustic Surveys // I ICES Annual Science Conference, Berlin, German, 21–25 September 2009. ICES Document CM 2009/N:12. 2009. 23 p.

14 Evaluate the characteristics of TVL and TVS standard gears used in BITS based on the details gear check according to the BITS manual and provide written documentation of findings

Two methods are presented in the BITS manual to check the used standard gears TVS and TVL. The fast check should be realized before the BITS starts. The more detailed check of all components of the gear is dependent on the intensity of the use of the gears. Germany presented detailed check of the TVS's used during the BITS in 2011 (Velasco *et al.*, 2011). The results was discussed during the meeting in 2011 and WGBIFS recommended that all countries carry out detailed checks of the used standard gears until the meeting of WGBIFS in 2012 and present the results during the meeting. Table 14.1 summarizes the activities of the countries. The results are presented in different formats which make it difficult to have a fast overview concerning possible deviations between the required and measured parameters. Therefore, it was agreed that the EXCEL sheet provided by Germany should be used as standard format for the report of later detailed checks.

Table 14.1. The activities of checking the used standard gears TVS and TVL by counties.

Country	Detailed check	Year of production	Contact person	Remarks
SWE	yes	2000	Ann-Christin Rudolphi	
EST	yes	2010	Tiit Raid	Checked, but no written protocols
LAT	-		Ivo Sics	Used Polish fishing gears
LIT	yes	2010	Marijus Spegys	
RUS	yes	2000/2009	Igor Karpushevskiy	
POL	no	1999/2008	Wlodzimierz Grygiel	
GER	yes	2010/2011	Andres Velasco	
DEN	yes	2011	Henrik Degel	

Results of the check of Germany, Lithuania and Russia are presented in the format of standard tables (Table 14.2–14.5) below. The results of Swedish measurements were made available based on the description of the BITS manual.

The comparison of the required and measured data showed that the relative differences were less than 5% in the most cases. These results suggest that the used trawls did not significantly influence the indices of BITS. The group agreed that detailed checking of the standard gears should be realized once per year and the results should be presented in the format of the standard table.

Table 14.2. Check list for the German TVS trawl and for frame ropes of trawl Tag no. TV3-520# - 01.

Check list for trawl TV3-520#											
Section	Manual TV3-520# page 42	Standard			Tag no. TV3-520# - 01				Relative error [%]		Remarks
		Measured distance [m]	Mesh size [mm]	Number of meshes	Measured distance [m]	Mesh size [mm]	Mesh size mean	Number of meshes	Mesh size [mm]	Number of meshes	
1	1B1	8,22	120	69	8,09	122	122	66,3	1,7	-3,2	
	1A1	8,10	200	41	8,06	200	200	40,3	0,0	-0,5	
	1A2	8,10	200	41	7,94	198	200	39,7	0,0	-2,0	
	1B2	8,22	120	69	7,89	114	114	69,2	-5,0	1,0	
	1C1	8,28	120	69	8,09	112	112	72,2	-6,7	4,7	
	1C2	8,28	120	69	8,06	120	121	66,6	0,8	-3,5	
2	2B1	2,04	80	26	2,06	84	84	24,5	5,0	-3,8	
	2A	2,04	120	17	2,00	122	122	16,4	1,7	-3,6	
	2B2	2,04	80	26	2,04	84	84	24,3	5,0	-4,8	
	2C1	2,12	80	27	2,10	82	82	25,6	2,5	-3,4	
	2C2	2,12	80	27	2,10	82	82	25,6	2,5	-3,4	
3	3B1	1,96	80	25	2,14	86	86	24,9	7,5	1,6	
	3A	1,96	80	25	2,12	86	86	24,7	7,5	0,6	
	3B2	1,96	80	25	2,06	88	88	23,4	10,0	-4,5	
	3C	2,12	80	27	2,12	84	84	25,2	5,0	-4,8	
4 (2 subsections)	4B1	7,92	80	99	7,81	80	80	97,6	0,0	-1,4	
	4A	7,92	80	99	7,70	80	80	96,3	0,0	-2,8	
	4B2	7,92	80	99	7,73	82	82	94,3	2,5	-4,8	
	4C	8,00	80	100		82	82				
5 and 6 together	5B1+6B1	7,88	80	99	8,39	88	88	95,3	10,0	-3,2	
	5A+6A	7,88	80	99	8,20	80	80	102,5	0,0	4,1	
	5B2+6B2	7,88	80	99	8,10	88	80	101,3	0,0	2,8	
	4C+5C+6C	15,96	80	200	16,31	80	80	203,9	0,0	2,2	
Codend			40			42					
			20			24					
Mean mesh opening in codend (OMEGA mesh gauge): 35 mm (36, 35, 35, 34, 35, 36, 35, 34, 35, 35)											

Check list for frame ropes of trawl TV3-520#			
Manual TV3-520# page 43	Measured distance [m]		Remarks
	Standard	TV3-520# -01	
Head line extension Port.	3,00	2,92	
Head line wing section Port.	12,68	12,6	
Head line bosom section	2,80	2,9	
Head line wing section Stbd.	12,68	12,58	
Head line extension Stbd.	3,00	2,9	
Fishing line extension Port.	0,80	0,86	
Fishing line wing section Port.	14,41	14,08	
Fishing line bosom section	2,80	2,94	
Fishing line wing section Stbd.	14,41	14,1	
Fishing line extension Stbd.	0,80	0,93	
Lower wing line Port.	3,73	3,6	
Lower wing line Stbd.	3,73	3,62	
Upper wing line Port.	3,83	3,73	
Upper wing line Stbd.	3,80	3,7	

Type of fishing gear:	TV3-520# - 01
Nation:	Germany
Date of measurements:	27.09.2011
Name of operators:	Mieske, Oeberst, Velasco
Number of realized hauls:	
Comments concerning the use:	

Table 14.3. Check list for the German TVS trawl and for frame ropes of trawl Tag no. TV3-520# - 02.

Check list for trawl TV3-520#											
Section	Manual TV3-520# page 42	Standard			Tag no. TV3-520# - 02				Relative error [%]		Remarks
		Measured distance [m]	Mesh size [mm]	Number of meshes	Measured distance [m]	Mesh size [mm]	Mesh size mean	Number of meshes	Mesh size [mm]	Number of meshes	
1	1B1	8,22	120	69	7,94	120	122	65,1	1,7	-5,0	
	1A1	8,10	200	41	8,30	200	202,3	41,0	1,2	1,3	
	1A2	8,10	200	41	8,15	200	197,3	41,3	-1,3	2,0	
	1B2	8,22	120	69	8,23	120	120	68,6	0,0	0,1	
	1C1	8,28	120	69	7,94	120	118,0	67,3	-1,7	-2,5	
	1C2	8,28	120	69	7,98	120	120	66,5	0,0	-3,6	
2 and 3 together	2B1+3B1	4,00	80	50	3,91	80	80	48,9	0,0	-2,3	
	2A+3A	4,00	120	33	3,93	120	120	32,8	0,0	-1,8	
	2B2+3B2	4,00	80	50	4,15	80	80	51,9	0,0	3,8	
	2C1+3C	4,24	80	53	4,10	80	80	51,3	0,0	-3,3	
	2C2	4,24	80	53							
3		1,96	80	25							
		1,96	80	25							
		1,96	80	25							
		2,12	80	27							
4	4B1	7,92	80	99	7,92	81	81	97,8	1,3	-1,2	
	4A	7,92	80	99	7,94	80	80	99,3	0,0	0,3	
	4B2	7,92	80	99	7,96	81	81	98,3	1,3	-0,7	
	4C	8,00	80	100	7,90	81	81	97,5	1,3	-2,5	
5 and 6 together	5B1+6B1	7,88	80	99	7,86	82	82	95,9	2,5	-2,7	
	5A+6A	7,88	80	99	7,87	81	81	97,2	1,3	-1,4	
	5B2+6B2	7,88	80	99	7,79	81	81	96,2	1,3	-2,4	
	5C+6C	7,96	80	100	7,79	82	82	95,0	2,5	-4,5	
Codend			40			40	40				
			20			20	20				
Mean mesh opening in codend (OMEGA mesh gauge): 33,5 mm (34, 33, 34, 33, 34, 34, 34, 33, 33, 33)											

Check list for frame ropes of trawl TV3-520#			
Manual TV3-520# page 43	Measured distance [m]		Remarks
	Standard	TV3-520# -02	
Head line extension Port.	3,00	2,96	
Head line wing section Port.	12,68	12,6	
Head line bossom section	2,80	2,56	
Head line wing section Stbd.	12,68	12,6	
Head line extension Stbd.	3,00	3	
Fishing line extension Port.	0,80	0,8	
Fishing line wing section Port.	14,41	14,32	
Fishing line bossom section	2,80	2,8	
Fishing line wing section Stbd.	14,41	14,3	
Fishing line extension Stbd.	0,80	0,8	
Lower wing line Port.	3,73	3,6	
Lower wing line Stbd.	3,73	3,46	
Upper wing line Port.	3,83	3,48	
Upper wing line Stbd.	3,80	3,45	

Type of fishing gear:	TV3-520# - 02
Nation:	Germany
Date of measurements:	27.09.2011
Name of operators:	Mieske, Oeberst, Velasco
Number of realized hauls:	
Comments concerning the u:	Three holes to repair:

Table 14.4. Check list for the Lithuanian TVS trawl and for frame ropes of trawl Tag no. TV3-520#.

Check list for trawl TV3-520#											
Section	Manual TV3-520# page 42	Standard			Tag no. TV3-520#-				Relative error [%]		Remarks
		Measured distance [m]	Mesh size [mm]	Number of meshes	Measured distance [m]	Mesh size [mm]	Mesh size mean	Number of meshes	Mesh size [mm]	Number of meshes	
1	1B1	8.22	120	69	8.23	121	121	68.0	0.8	-0.7	
	1A1	8.10	200	41	8.25	201	201	41.0	0.5	1.3	
	1A2	8.10	200	41	8.25	201	201	41.0	0.5	1.3	
	1B2	8.22	120	69	8.23	121	121	68.0	0.8	-0.7	
	1C1	8.28	120	69	8.35	121	121	69.0	0.8	0.0	
	1C2	8.28	120	69	8.35	121	121	69.0	0.8	0.0	
2	2B1	2.04	80	26	2.04	80	80	25.5	0.0	0.0	
	2A	2.04	120	17	2.04	120	120	17.0	0.0	0.0	
	2B2	2.04	80	26	2.08	80	80	26.0	0.0	2.0	
	2C1	2.12	80	27	2.16	80	80	27.0	0.0	1.9	
	2C2	2.12	80	27	2.16	80	80	27.0	0.0	1.9	
3	3B1	1.96	80	25	2.00	80	80	25.0	0.0	2.0	
	3A	1.96	80	25	2.00	80	80	25.0	0.0	2.0	
	3B2	1.96	80	25	2.00	80	80	25.0	0.0	2.0	
	3C	2.12	80	27	2.08	80	80	26.0	0.0	-1.9	
4	4B1	7.92	80	99	7.92	80	80	99.0	0.0	0.0	
	4A	7.92	80	99	7.92	80	80	99.0	0.0	0.0	
	4B2	7.92	80	99	7.92	80	80	99.0	0.0	0.0	
	4C	8.00	80	100	7.95	82	82	97.0	2.5	-3.0	
5	5B1	3.96	80	50	4.00	80	80	50.0	0.0	1.0	
	5A	3.96	80	50	3.90	83	83	47.0	3.8	-5.1	
	5B2	3.96	80	50	4.00	80	80	50.0	0.0	1.0	
	5C	4.00	80	50	3.90	83	83	47.0	3.8	-6.0	
6	6B1	3.92	80	49	4.00	80	80	50.0	0.0	2.0	
	6A	3.92	80	49	3.92	80	80	49.0	0.0	0.0	
	6B2	3.92	80	49	3.92	80	80	49.0	0.0	0.0	
	6C	3.96	80	50	3.98	78	78	51.0	-2.5	3.1	
Codend			40		1.9	38	38	50			
			20		1.8	20	20	90			
Mean mesh opening in codend (OMEGA mesh gauge): mm (n, n, n, n, n, n, n, n, n, n)											

Check list for frame ropes of trawl TV3-520#			
Manual TV3-520# page 43	Measured distance [m]		Remarks
	Standard	TV3-520#	
Head line extension Port.	3.00		
Head line wing section Port.	12.68		
Head line bossom section	2.80		
Head line wing section Stbd.	12.68		
Head line extension Stbd.	3.00		
Fishing line extension Port.	0.80		
Fishing line wing section Port.	14.41		
Fishing line bossom section	2.80		
Fishing line wing section Stbd.	14.41		
Fishing line extension Stbd.	0.80		
Lower wing line Port.	3.73		
Lower wing line Stbd.	3.73		
Upper wing line Port.	3.83		
Upper wing line Stbd.	3.80		

Type of fishing gear:	TV3-520#
Nation:	Lithuania
Date of measurements:	03/07/1905
Name of operators:	Marijus Spegys
Number of realized hauls:	1
Comments concerning the u:	Three holes to repair:

Table 14.5. Check list for the Russian TVL trawl and for frame ropes of trawl Tag no. TV3-930#. Russia Q4 (17–28.10.2011).

Check list for trawl TV3-930#											
Section	Manual TV3-930 # page 57	Standard			Tag no. TV3-930# -				Relative error [%]		Remarks
		Measured distance [m]	Mesh size [mm]	Number of meshes	Measured distance [m]	Mesh size [mm]	Mesh size mean	Number of meshes	Mesh size [mm]	Number of meshes	
1	1B1	22.10	200	111	22.11	200	200	110.6	0.0	0.0	
	1A1	22.10	200	111	22.11	200	200	110.6	0.0	0.0	
	1A2	22.10	200	111	22.11	200	200	110.6	0.0	0.0	
	1B2	22.10	200	111	22.11	200	200	110.6	0.0	0.0	
	1C1	8.28	120	69	8.28	120	120	69.0	0.0	0.0	
	1C2	8.28	120	69	8.28	120	120	69.0	0.0	0.0	
2	2B1	2.96	160	19	2.95	160	160	18.4	0.0	-0.3	
	2A	2.96	160	19	2.95	160	160	18.4	0.0	-0.3	
	2B2	2.96	160	19	2.95	160	160	18.4	0.0	-0.3	
	2C1	3.00	120	25	2.95	120	120	24.6	0.0	-1.7	
	2C2	3.00	120	25	2.95	120	120	24.6	0.0	-1.7	
3	3B1	2.94	120	25	2.95	120	120	24.6	0.0	0.3	
	3A	2.94	120	25	2.95	120	120	24.6	0.0	0.3	
	3B2	2.94	120	25	2.95	120	120	24.6	0.0	0.3	
	3C	3.00	120	25	2.95	120	120	24.6	0.0	-1.7	
4	4B1	7.92	80	99	7.78	80	80	97.3	0.0	-1.8	
	4A	7.92	80	99	7.78	80	80	97.3	0.0	-1.8	
	4B2	7.92	80	99	7.78	80	80	97.3	0.0	-1.8	
	4C	8.00	80	100	7.78	80	80	97.3	0.0	-2.8	
5	5B1	5.94	60	99	5.94	60	60	99.0	0.0	0.0	
	5A	5.94	60	99	5.94	60	60	99.0	0.0	0.0	
	5B2	5.94	60	99	5.94	60	60	99.0	0.0	0.0	
	5C	6.00	60	100	5.94	60	60	99.0	0.0	-1.0	
6	6B1	11.92	40	298	11.93	40	40	298.3	0.0	0.1	
	6A	11.92	40	298	11.93	40	40	298.3	0.0	0.1	
	6B2	11.92	40	298	11.93	40	40	298.3	0.0	0.1	
	6C	12.00	40	300	11.93	40	40	298.3	0.0	-0.6	
Codend			20		20						
			20		20						
Mean mesh opening in codend (OMEGA mesh gauge): mm (n, n, n, n, n, n, n, n, n, n)											

Check list for frame ropes of trawl TV3-930#			
Manual TV3-930 # page 59	Measured distance [m]		Remarks
	Standard	TV3-930 # -02	
Head line extension Port.	4.00	3.97	
Head line wing section Port.	28.50	28.50	
Head line bosom section	2.50	2.65	
Head line wing section Stbd.	28.50	28.50	
Head line extension Stbd.	4.00	3.97	
Fishing line extension Port.	0.95	0.95	
Fishing line wing section Port.	29.94	29.92	
Fishing line bosom section	1.68	1.68	
Fishing line wing section Stbd.	29.94	29.92	
Fishing line extension Stbd.	0.95	0.95	
Upper wing line Port.	2.70	2.75	
Upper wing line Stbd.	2.70	2.75	
Upper wing side Port.	2.15	2.40	
Upper wing side Stbd.	2.15	2.40	
Lower wing line Port.	2.75	2.80	
Lower wing line Stbd.	2.75	2.80	
Lower wing side Port.	2.20	2.20	
Lower wing side Stbd.	2.20	2.20	

Type of fishing gear:	TV3-930#
Nation: Russia	
Date of measurements: 23.10.2011	
Name of operators: Senior trawl master - Lubochonskiy Egor F.	
Number of realized hauls: 13	
Comments concerning the use:	The mesh size in the codend was 6.5 mm.
	The trawling depth and the net opening were controlled by a netsonde.
	Normally a net opening was achieved of about 5-6 m.

15 Evaluation of the BITS data stored in DATRAS for describing biodiversity in the Baltic Sea

During the meeting of WGBIFS in 2010 study was initiated related to the biodiversity in the Baltic Sea based on the data of Baltic International Trawl Surveys (BITS). A subgroup of WGBIFS members evaluated the usability of data stored in the DATRAS database for this issue and concluded that most countries do obtain complete species compositions for the hauls and length measure all fish species. Last year the group urged all countries that these data were recorded and all uploaded to DATRAS. The Group followed up on the issue this year and all countries except Poland has followed the request. This year the group agreed to make a formal recommendation concerning the issue. The table below shows the status of the situation.

Country	Start year for working up all fish species caught during BITS I and IV quarter	Are total weight and length data from all fish species caught during the BITS survey in all years uploaded to DATRAS? (Y/N)	Comments
Denmark	1991	Y	In recent years invertebrates are weighted and identified to family
Estonia	2011	Y	Invertebrates are not worked up
Germany	1991	Y	Invertebrates are not worked up
Latvia	2010 Q4	Y	Invertebrates are not worked up
Lithuania	2005	Y	Invertebrates are not worked up
Poland	Do not do it	N (only standard species)	Invertebrates are not worked up
Russia	1995	Y	Invertebrates are not worked up
Sweden	1991	Y	In recent years invertebrates are weighted and identified to family

Only few species of invertebrates are caught during trawling and only Sweden and Denmark work up the invertebrates in the catch. The only regularly caught species are the isopod *Saduria entomon,* the blue mussel *Mytilus edulis* and the jellyfish *Aurelia aurita*.

Any analysis of the data in respect to biodiversity was stopped last year because of the incompleteness of the data and no analysis has been carried out during this meeting either.

During BITS only hauls are taken at water depths more than 20 meters. This means that any results extracted from BIFS data are only representative for areas where the water depth is more than 20 m.

Data are available in DATRAS and is as such accessible for all scientific purposes.

16 Implementation of the stomach sampling program framed by WGSAM

The Working group on Multispecies Assessment Methods (WGSAM) in 2010 proposed the realization of stomach samples of the main predators in the North Sea and the Baltic Sea to improve the basic knowledge concerning the species interactions in relation to the multispecies approach. The group found that cod is one of the main predators in the Baltic Sea and proposed standard procedures for stomach sampling.

Five stomachs are required per 5 cm length intervals beginning with 5 cm in all ICES SD's according to the extended sampling level proposed by WGSAM. The group agreed that the amount of the sampling is realized by each subdivision because of the strong biological variability from west to east of the Baltic Sea due to the high salinity gradient. Different vessels cover different areas of the same ICES Subdivision during the BITS (like SD 25 – "Argos", "Dana" and "Baltica"). To get the best possible spatial distribution of the stomach samples it is necessary that all vessels which work in the same SD carry out sampling. About 80 stomach samples are required for each ICES SD and in total, about 560 stomach samples during each BITS.

To avoid a strong oversampling the group proposed that each vessel samples 5 stomachs per 5 cm length intervals beginning with 5 cm in each SD and stores the samples in freezer to protect the samples for extended analyses level in the lab. The sampling of the vessels takes into account that high spatial dispersion is required. All samples of the same SD are summarized and a random subsample is selected for the analyses taking into account the spatial and temporal distribution of the available samples. The group also pointed out, that stomach samples from bottom-trawl surveys are only available from the periods of middle of February to end of March and November, based on the BITS surveys.

Denmark has done regularly stomach sampling in BITS surveys in SD 25 already since 2007 and in 2012 quarter 1 BITS also Germany and Latvia collected stomach samples as shown in table 16.1.

Table 16.1. Cod stomach sampling in 2012 Q1 BITS surveys.

COUNTRY	SD 24	SD 25	SD 26	SD 28
Denmark		600		
Germany	67			
Latvia			41	28

In 2011 the group proposed two options for processing the stomach samples: either the national labs would get expertise and financial support for the processing, or preferably all stomach samples would be analysed in one institute which gets the expertise and financial support. It seems to be possible to get funding for this from the EU Commission, but at the moment, it is not yet confirmed.

17 Inquires from other Expert Groups

17.1 Review and update the structure of the BIAS database to incorporate the estimates of two herring stocks in one ICES Subdivision

The structure of the BIAS database will be updated before the next WGBIFS meeting accordingly to incorporate the estimates of two herring stocks in one ICES Subdivision. Instead of the herring mean weight and estimated total number tables in the **BIAS_DB**, four data tables will be created. Western Baltic Spring Spawning Herring (WBSSH) and Central Baltic Herring (CBH) stocks, both will have data tables for the mean weights and estimated total numbers. The new standard exchange format (an excel file with spread sheets) including sheets for both herring stocks was agreed during the meeting and added to the Manual for IBAS (see Table 6.1 in Addendum 2).

17.2 Evaluate the proportion of WBSS in SD 25 and SD 26 during the BIAS.

Herring (*Clupea harengus*) resources in the Baltic are assessed annually based on results from the ICES coordinated autumn Baltic International Acoustic Survey (BIAS). In addition, the sprat (*Sprattus sprattus*) stock in the Baltic Sea is also estimated on BIAS results. A second annual international acoustic survey in spring (Baltic Acoustic Spring Survey, BASS) additionally produces estimates of the sprat stocks as well as additional information concerning the central Baltic herring (CBH) stock.

In the Baltic Sea, several herring stocks are surveyed and managed separately. The Western Baltic Spring Spawning herring (WBSS), which is generally distributed in the Skagerrak/Kattegat area (ICES Division IIIa) and in ICES Subdivisions (SD) 21–24 and mainly spawns in spring in the Greifswalder Bodden. The easterly adjacent areas of the southern Baltic Sea (SD 25–32) are inhabited by the Central Baltic Herring (CBH) stock. Spatial stock separation for assessment purposes so far is based on ICES Subdivisions with SD 21–24 being allocated to WBSS and SD 25–32, among others, to CBH.

The German/Danish joint acoustic survey in autumn (GERAS) is surveying Subdivisions 21–24, thus covering (northwest to east) the Kattegat (SD 21), the western Baltic belt sea (SD 22), the Öresound (SD 23) and the Arkona Sea (SD 24).

Survey results of GERAS since 2007 have shown a decline in mean weights per age group. Additionally, there is an uncharacteristic decrease in mean weight with increasing age obvious in the age-classes >3. The 2010 survey results also showed a distinct peak in age-class 3 as compared to previous years. However, no signs of an extraordinarily strong year class 2007 are evident. Instead, the year classes 2007 and 2008 are among the lowest observed since 2002. Checks and comparisons of Subdivision-based length distributions of herring in the 2009 and 2010 surveys showed nothing conspicuous – both in SD 21 and 22 young year classes (0–2) dominated with lengths rarely exceeding 20 cm. As in previous years, large fractions of adult herring were identified in SD23 (Öresound) with overall lengths partly exceeding 30 cm and smaller length groups (corresponding to age-classes 0 to 2) only contributing a small fraction. In SD 24, overall length distributions were different but in accordance with the distributions measured in 2009 with the majority of fish between 8.25 cm and ca. 15.25 cm (~age 0 and 1) and a smaller fraction between ca. 15.25 and 22.25 cm (~age 2 and 3). Older and bigger herring only marginally contributed to the measured population in SD 24. Analysis of the mean weight at-age however showed that the decline

in weight with increasing age is mostly pronounced in SD 24. This led to the interpretation and conclusion that in SD 24 an increase in contribution of older, slow growing herring apparently has taken place in recent years. These herring originate in easterly adjacent areas and belong to the Central Baltic Herring stock.

Apparently, this trend has been present for some years implying that biomass and abundance estimates for WBSS based on autumn surveys conducted in SD 21–24 in 2011 and in previous years possibly might be biased due to a variable fraction of undetected CBH mistakenly included in the assessment.

Separation function based on the different growth curves of WBSS and CBH herring were presented in based on the German BASS and BIAS as well as German samples of the commercial fishery (Gröhsler *et al*., 2011). The database was extended based on Latvian, Polish and Swedish data from BASS, BIAS and samples of commercial fishery (Gröhsler *et al*., 2012). The analyses showed that mixing is most pronounced in SDs 24–26, with proportions of WBSSH decreasing further eastwards. In SD 21 and SD 23, the fraction of CBH was either very low, or CBH were not present at all. Only some few WBSSH were observed in SDs 27–29. In SD 22, mixing occurred to a variable degree. However, in this area the mixing with CBH can be neglected due to following reasons:

- within GERAS, the fraction of older (3+) herring - which is mainly contributing to the mixing - is comparatively low.
- the contribution of the commercial trawl fishery to the overall catch of WBSSH is currently rather low (2005–2010: 3.6%).

Following SF should be used to separate WBSSH and CBH

SF = 25.3962*(1-e(-0.385*(age*12+T)/12–0.262))

where T presents the month of catch.

It is suggested that the herring stock indices of BIAS from 2005 to 2012 in SD 24 to 26 are split up into the two stocks (Western Baltic Spring Spawning Herring and Central Baltic Herring) until end of 2012 to provide corrected time-series of herring stocks for the benchmark assessment of WGBFAS in 2013. The method for calculating the proportion of age groups of herring of both herring stocks based on the available data are given in the annex of the presented working document (Gröhsler *et al*., 2012). In addition, it is necessary to provide the commercial catches in SD 24 to 26 split up to WBSS and CBH for the assessment according to the roadmap given in Gröhsler *et al*., 2012).

17.2.1 References

Gröhsler, T., Oeberst, R., Schaber, M. 2011. Mixing of two herring (*Clupea harengus*) stocks in ICES Subdivision 24 (Arkona Sea, Western Baltic) – Implications and consequences for stock assessment.

T. Gröhsler, R. Oeberst, M. Schaber, NN (Sweden), NN (Poland), NN (Latvia). 2012. Mixing of Western Baltic Spring Spawning and Central Baltic Herring (*Clupea harengus* L.) Stocks – Implications and Consequences for Stock Assessment. Working document of WGBIFS 2012, Helsinki Finland, 23 pp.

17.3 Discuss the suggested new maturity scales for flatfish

WKMSSPDF2 proposed new codes for describing the maturity stages of flatfish (sole, plaice, dab and flounder) in the report of 2012(ICES, 2012). The new 5 (+1 abnormal)

scale code was described in the report for the four species by sex and was defined as the new standards.

Table 17.3.1. The conversion table for the codes of the national maturity key and the codes of the WGMSSPDF key for flatfish.

Country	BITS	Denmark	Estonia	Finland	Germany	Latvia	Lithuania	Poland	Russia	Sweden
Species	**All**		**Flatfish**		**Flatfish**	**Flatfish**	**Flatfish**	**Flatfish**	**Flatfish**	**Flatfish**
Source	**ICES (2012)**	**not available**	**Kiselevich (1923), Pravdin (1966)**	**not available**	**Maier (1908)**	**Kiselevich (1923), Pravdin (1966)**	**Aleksjeev, Aleksjeeva (1996) Pravdin (1966)**	**Maier (1908)**	**Aleksjeev, Aleksjeeva (1996)**	**Maier (1908)**
Maturity stage1)	Code									
IMMATURE (immature)	6.1		I	I	I	I	I, II	I	Juv., II	I, II
MATURING (mature)	6.2		II–IV	II	III–IV	III, VI	III, IV, VI(II)	II, III, IV	III, IV	III, IV, V
SPAWNING (mature)	6.3		V	III	V-VII	V	V	V,VI,VII	V, VI (V),	VI
SPENT (mature)	6.4		VI	IV	VIII	VI	VI	VIII	VI	VII
SKIPPED SPAWING (mature/ immature2))	6.5		VI(II)	V	II	II	S	S excl. males	VI (II)	VIII
ABNORMAL	6.6		A		IX	VII	A	IX		IX

1) Sexual maturity for estimating the proportion of spawners (mature individuals).

2) Should be used when the investigation was during the prespawning and early spawning time (still no spent individuals). Individuals will not contribute to the spawning stock in the present year.

A six-stage scale for cod was already discussed last year during WGBIFS. One of the problems was that several countries were not able to convert directly from the old five state scale to the new six state scale directly. This means that old data had to be re-uploaded in order to have the maturity scale updated backwards in time. The Baltic countries were not prepared to re-upload all old data and were reluctant to break the time-series. Instead a more generic approach was suggested that the Baltic institutes from a certain date onwards should upload their national used maturity stage scales to DATRAS and that these should be converted to the internationally accepted maturity stage automatically within DATRAS. This would provide the maximal flexibility for future revisions of the maturity scales without re-uploads. Old data should not be changed as a starting point. The idea was discussed with ICES and they agree to look into it when they have received the mapping keys from each country. Unfortunately, this was not initiated last year.

The group again this year discussed the new maturity scale now for flatfish and contacted ICES in order to verify that ICES still saw this as a possibility. ICES again agreed to provide the facility to upload national scales to DATRAS and automatically convert it to the new six state scale agreed during WKMSSPDF. Therefore, it was agreed that all countries should provide one-to-one conversion keys between the national used maturity scales and both the old 5 stage scale and the new 6 stage scale and that these will be forwarded to ICES. This will provide the possibility for end-users to use the old scale having the long time-series available or using the new scale only having a short time-series available. The conversion between the national scales and the new scales plus the national scales and the old scales are given in Annex 10.

17.3.1 References

ICES. 2010. Report of the Workshop on Sexual Maturity Staging of sole, plaice dab and flounder (WKMSSPDF). ICES CM 2010/ACOM:50, 96 pp.

ICES. 2012. Report of the Workshop2 on Sexual Maturity Staging of sole, plaice, dab and flounder (WKMSSPDF2). ICES CM 2012/ACOM:50, 60 pp.

17.4 Discuss the suggested increase of the spatial overlap between "Solea" and "Havfisken"

Two international coordinated Baltic International Trawl Surveys (BITS) were established in the Baltic Sea in 2001 to estimate unbiased stock indices of both Baltic cod stocks and of the flatfish stocks in quarter 1 and 4. The different steps from the planning and the allocation of the fishing stations, the period of surveys, the velocity and the duration as well as the period of the BITS, the processing of the hauls, the storage of the data in the DATRAS database and the procedures to estimate the stock indices are highly standardized. In addition, standardized trawls are used (TVL and TVS). All steps are documented in the BITS manual or in the reports of WGBIFS which were agreed by the group. The coordination of the BITS is organized by the WGBFIS.

All agreements of WGBIFS according the survey design, the planning and allocation of stations disagree with the separate use of the data of "Havfisken" as a separate tuning fleet as it is used by WGBFAS: "The tuning series used in the assessment are the German "Solea" 4Q survey, the Danish "KASU" survey from the 1st and 4th quarter and a commercial cpue from Danish trawlers (Table 2.3.18)." (ICES 2011, WGBFAS report, update assessment of Cod in Subdivision 22–24).

In addition, WGBFAS recommended to WGBIFS 2012: "WGBIFS is recommended to combine the two survey indices for Western Baltic cod from "Solea" and KASU, respectively. They are at present covering separate areas. A suggested solution is to increase the spatial overlap between "Solea" and "Havfisken" on a permanent basis (recommendation of WGBFAS in 2011).

The fishing station in SD 22–24 are planned as a unit to estimating unbiased stock indices of the western Baltic cod stock (SD 22–24) and are realized by Denmark and Germany as part of BITS. The planned stations were realized by RV "Havfisken" (Denmark) and RV "Solea" (Germany). Both vessels use the small standard trawl TVS. It was agreed by WGBIFS that Solea works only in SD 22 and 24 to avoid problems with the conversion factors between TVL and TVS because the most stations in SD 25 – 28 are realized with TVL. Total of 15 (until quarter 1 in 2008) and 23 (since quarter 4 in 2008) stations were planned for Havfisken for each BITS. Three of the stations were allocated to SD 23 because Solea does not get permission for trawl fishing and 20 stations were available for SD 22 and 24. Solea planned 60 and 57 stations for the quarter 1 and quarter 4 BITS, respectively. It was agreed by WGBIFS that all countries provide feedback from the fishing stations according the rules given in the WGBIFS report to improve the Tow Database of fishable stations.

Inter-calibration experiments between Havfisken and Solea were realized in November 2009 during BITS in the northwestern part of SD 24 (Velasco and Thaarup, 2010 in the report of WGBIFS). The three stations were part of the regular survey stations of Solea and inter-calibration experiments of Havfisken outside the regular BITS. More fishing stations could not be realized due to the time schedule of both vessels. The experiments showed that Havfisken had problems to realize the required velocity of 3 kn (mean 2.5 kn). On the other hand Solea was slightly to fast with a mean of 3.2 kn.

The cpue of the three stations varied in a large range for cod and flounder, but the cpue values of both vessels were comparable. In addition, the length frequencies of cod and flounder were similar.

Different studies have shown that the hydrographical conditions can significantly influence the distribution pattern of cod. Hinrichsen *et al.* (2001) showed that pelagic stages of cod can be transported from the Kiel bight to areas east of Bornholm within 25 days during inflow events. Oeberst and Böttcher (1998) captured juvenile cod in SD 25 which were spawned in the western Baltic Sea and Oeberst (2001) quantified the proportion of western Baltic cod in SD 25 during BITS based on the length distributions. In addition, it was shown that the spatial distribution patterns of defined length ranges of cod strongly varied from year-to-year between 2002 and 2008 (Oeberst, 2008). All these studies clearly suggested that the estimates based on a part of the total are SD 22–24 provides probably biased stock indices.

To get a clearer overview of the situation in SD 22 to SD 24 data of "Havfisken" and "Solea" are used to study possible factors which might influence the cpue data of both vessels based on the BITS from 2005 to 2006 and from 2008 to 2010. These periods were chosen dependent on the availability of data. The analyses were based on length to avoid possible effects of the uncertainty of ageing of cod (see reports of SGABC). Detailed analyses are given in the working document of WGBFAS 2012 (Oeberst, 2012).

17.4.1 Main results

Between 15 and 23 fishing stations were planned for Havfisken and between 57 and 60 fishing stations were planned for Solea for the total area SD 22 - 24. That means that less than 30% of the total planned stations were allocated to Havfisken. The area which is covered by Havfisken presents less than 23% of the total area.

The number of age reading based on Havfisken station presents between 4.6% and 38.2% of the total age readings in SD 22–24.

The realization of fishing stations by Havfisken was not in line with the BITS manual in 92% due to too low velocity. The realization of fishing stations by Solea was not in line with the BITS manual in 30% due to too high velocity and/or too large distance.

Spatial overlap of both vessels were planned for the quarter 4 survey in 2009 based on the increase of planned stations by Hafvisken from 15 to 23 from quarter 4 in 2008 onwards. The experience of this BITS in quarter 4 in 2009 showed that Hafvisken can not realize stations in SD 24. Therefore, spatial overlap is only possible in the Kiel and Mecklenburg Bight as realized during the last years with low intensity. The results are probably influenced by migration processes due to the distance of about 14 days between the cruises of both vessels.

The spatial distribution of cod in SD 22 – 24 is highly variable in number and length distribution. Therefore, it is not possible to estimate unbiased stock indices of the total stock based on subsets of the data.

A higher spatial overlap which includes stations of Havfisken in the total part of the Arkona Sea and stations of Solea in the Belts will not solve the problem that stock indices based on subsets presents biased estimates.

17.4.2 Recommendations

WGBIFS recommends that all BITS stations realized in SD 22–24 are used as one unit like it is recommended and agreed by during WGBIFS meetings by all countries. The procedures for estimating stock indices based on the BITS manual are realized in the DATRAS database together with estimation of confidence intervals. In addition, it is necessary that the fishing stations are realized according to the BITS manual.

17.5 Discuss whether a modification of the BITS survey design would give a better sampling of the older age-classes of cod

The design of the BITS was developed during the WGBIFS 2000 to 2003 and was described in the reports and special aspects of allocation of fishing stations were presented in working documents. In 2007 and 2008 it was discussed whether it is possible to extend the BITS in SD 25 to SD 28 in the more shallow water because only area deeper than 20 m is covered due to the working depth of the used research vessels. It was agreed that the shallow water cannot be covered because the required smaller vessels are not available (See WGBIFS 2007 ToR 12 and WGBIFS 2008 ToR 13 and ToR 14). In addition, different studies were realized based on the data stored in the DATRAS database (Oeberst, 2000, 2008a, 2008b, 2010a, 2010b). The analyses did not indicate that the used survey design does not well cover the distribution areas of larger cod.

The studies showed that the older cod are concentrated in the mean depth layers which are well covered by the BITS, The problem is that cod is highly patchy distributed with high variations from year-to-year. On the other hand the number of cod larger than 50 cm is very low. The studies were realized based on the length of cod to avoid the known differences of ageing of cod (see study group SGABC in 2004 – 2006). A change of the allocation of stations requires clear aim, which must be transferred in the survey design. The analyses did not show that an increase of station within an SD or depth layer will improve the accuracy of the cpue values of age group, especially when different types of the interpretation of the otolith structure exist.

Independent of this statement the relation between the catch of cod larger than 59 cm was related to the catch of cod with a length between 39 cm and 59 cm was estimated based on the data of commercial catches (available in FishFrame) and of BITS. The lowest length of 39 cm was chosen in relation to minimum landing size of commercial fishery. The limit of 60 cm was chosen dependent on the length frequencies in the BITS data which show clear decrease of the cpue after 50 cm (Figure 17.5.1). In addition cod older than 4 years is larger than 60 cm in most cases.

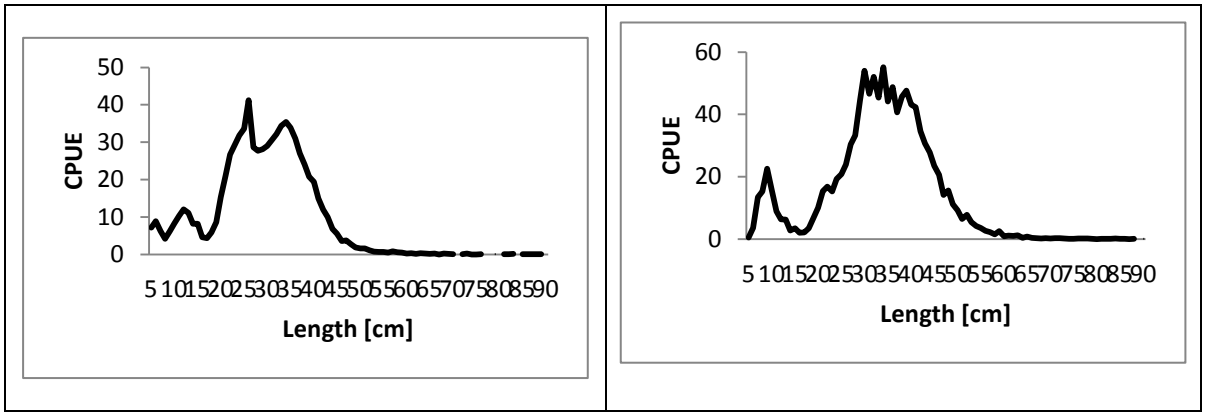


Figure 17.5.1. Mean cpue (catch in number per hour) in SD 25 in 2007 (left pannel) and 2009 (right panel) based on BITS.

The quotient of catch of larger cod in relation to the cod between 39 cm and 59 cm was mostly lower than 0.10. Table 17.5.1 presents the estimates based on the commercial catches in spring by year, SD and Country (DNK – Denmark, DEU – Germany, LVA – Latvia). The data suggest that the proportion of large cod by Latvia is higher than the catch of Demark and Germany in SD 25 to SD 28. The similar fraction of larger cod was observed based on the BITS data (Table 17.5.2). The comparison does not indicate that the BITS significantly underestimates cod larger 60 cm. BITS estimates equal or larger fractions of larger cod in SD 26 compared to Latvia. The comparison of the estimates of quarter 1 and quarter 4 based on commercial samples (Table 17.5.3) also does not indicate systematically underestimation of larger cod by BITS because the fraction of larger cod in quarter 1 and 4 are similar in commercial catches. Unfortunately, indices of quarter 4 BITS could not be downloaded during the meeting of WGBIFS because the indices were recalculated by the ICES data centre.

The differences between Latvian data and the data of the other countries in SD 25 to SD 28 need additional analyses.

Table 17.5.1. Quotient of catch of cod larger than 59 cm in relation to the cod between 39 cm and 59 cm based on the commercial catches in spring by year, SD and Country (DNK – Denmark, DEU – Germany, LVA – Latvia).

Year	Country	Quarter	SD					
			22	23	24	25	26	28
2008	DNK	1			0	0.02		
2009	DEU	1	0.18		0.04	0.02		
2009	LVA	1				0	0	0
2010	DEU	1	0.14		0.05	0.03		
2010	LVA	1				0.06	0.06	0.06
2011	DNK	1	0.14	0.06	0.03	0.03	0.04	0.04
2011	LVA	1				0.06	0.06	0.06

Table 17.5.2. Relation between the cod larger than 59 cm in relation of cod between 39 cm and 59 cm in BITS by year, SD based on the DATRAS database.

Year	Country	Quarter	SD					
			22	23	24	25	26	28
2007	BITS	1	0.13		0.04	0.03	0.10	
2008		1	0.59		0.03	0.03	0.05	
2009		1	0.27		0.05	0.03	0.06	
2010		1	0.07		0.06	0.03	0.08	
2011		1	0.06		0.04	0.03	0.08	

Table 17.5.3. Relation between the cod larger than 59 cm in relation of cod between 39 cm and 59 cm in commercial catches by year and country in quarter 4 based on FishFrame.

Year	Country	Quarter	SD					
			22	23	24	25	26	28
2008	DNK	4			0	0.02		
2009	DEU	4	0.03		0.03	0.05	0.05	0.05
2009	LVA	4				0	0	0
2010	DEU	4	0.01		0.02	0.07		
2010	LVA	4				0.06	0.06	0.06
2011	DNK	4	1.42	0.09	0.03	0.03	0.03	0.03
2011	LVA	4				0.05	0.05	0.05

The differences between Latvian data and the data of the other countries in SD 25 to SD 28 need additional investigations. Analyses of Russian colleagues suggested that large cod is not representative captured in SD 26 if the oxygen conditions are bad in deeper water. They observed higher densities of cod age group 3+ in 2010 where good oxygen conditions were observed compared to 2009 and 2011 (Figure 17.5.2).

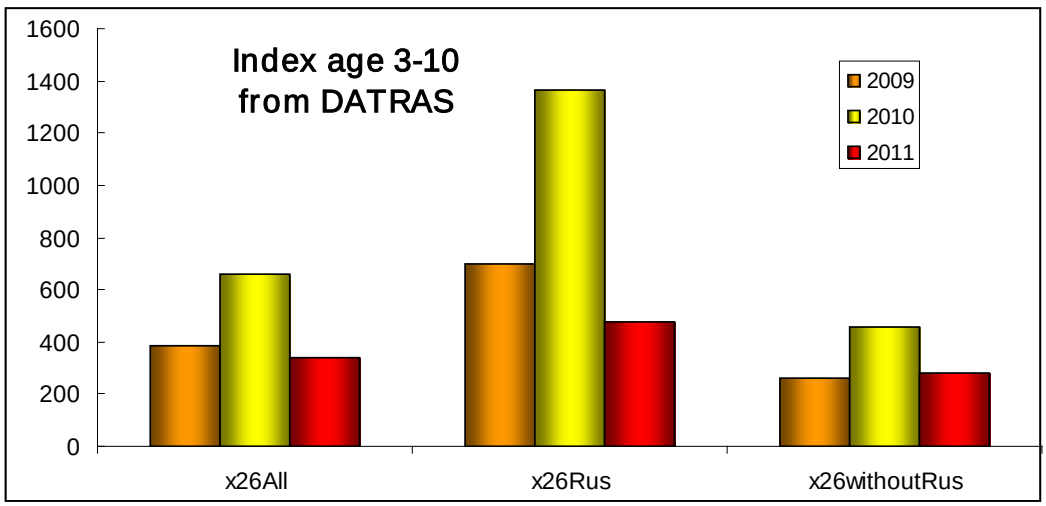


Figure 17.5.2. Mean cpue of age group 3+ cod in SD 26 and the Russian zone in 2009 – 2011 based on BITS in spring.

They assumed that larger cod prefer the deeper area and stay in the pelagic above the gear if the oxygen conditions are bad (Figure 17.5.3). Similar interpretations were intensively discussed related to ´"Review of new results on the vertical distribution of the cod (during the BITS; ToR i)". To avoid possible misinterpretation due to ageing the analyses were repeated based on length data. The data of SD 25 to SD 26 suggest that detailed investigation of the data in these SD's are required improving the understanding of the variability of stock indices. Independent of these suggestions the estimates based on the commercial catches and the BITS do not indicate a systematic underestimation of cod larger than 59 cm.

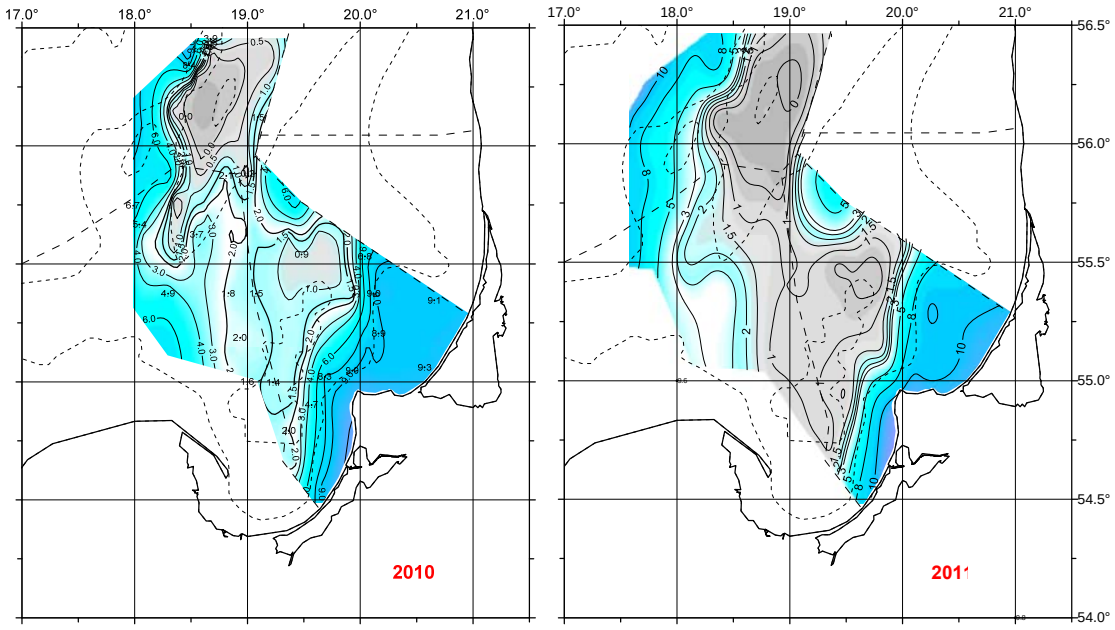


Figure 17.5.3. Bottom-water oxygen concentration (ml/l) February – March 2010–2011.

17.5.1 Recommendations

WGBIFS recommends that the BITS-indices including the data of older cod (at age 5 and older) can be used in the assessment of the cod stocks in the Baltic Sea without restrictions. The group further recommends analyses of the spatial and temporal distribution of cod and flounder based on BITS.

17.6 Discuss the suggested collection and storage of marine litter information in the Baltic International Trawl Survey

Based on EC's Marine Strategy Framework Directive (MSFD) requested WKMAL WGBIFS to discuss the suggested collection and storage of information about the marine litter in the Baltic International Trawl Survey. Such data have been already collected for example in the Swedish IBTS surveys in the North Sea and in the BITS surveys in the Baltic since autumn 2010. The group agreed that marine litter data can be collected in BITS surveys as standard procedure, and the same standard form and the protocol (see Annex 11), will be used as in the IBTS surveys. The questions with the storage of collected litter data will be discussed in national level with the persons responsible for MSFD descriptor 10.

17.7 Discuss how to estimate the survey sampling variance.

WGBIFS discussed calculations of survey sampling variance as requested by WGMG. For the BITS survey sampling variance is already available via the DATRAS database. http://datras.ices.dk/Data_products/Download/Download_Data_public.aspx (In the field "Data products" Bootstrap Data should be chosen).

Regarding BIAS and BASS a confidential interval could be produced using the bootstrap method for each subdivision, but due to lack of a common database for this less aggregated survey data that is needed when performing these calculations, it is currently not possible to present a survey sampling variance. Therefore a common database for the appropriate data were discussed and that Fishframe could be reworked and function as a "intermediate storage" for the workgroup. Data will be uploaded by each country and thereafter exported and used as input to scripts that are managed by the WGBIFS and produces the survey sampling variance. For this work to get started it is recommended that WGBIFS members (BIAS, SPRASS/BASS) meet the current Fishframe developer in for a common workshop, WGBIFS directs this recommendation to the countries: Germany, Poland, Sweden, Latvia, Finland and Russia.

WGBIFS requests more information regarding use of other methods and calculations for a survey sampling variance. Due to current lack of time available to the workgroup and its members, WGBIFS recommends that different methods and algorithms for deriving a survey sampling variance should be presented by appropriate workgroup (WGMG) to WGBIFS, the advantages and disadvantages of the different methods evaluated and explained in an easy accessible way preferable with attached example files that simplifies the additional work needed by WGBIFS. Furthermore information regarding the merits and demerits of these different methods when used to compare the variance in between different types of surveys is requested.

18 Selection of the venue for the next meeting

There were two proposals for the venue of the next meeting: Tartu, Estonia and Gdynia, Poland. The majority of the group supported the idea to organize the next meeting in Tartu, Estonia.

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Annex 2: Agenda

Introduction

1) Welcome and introduction

2) Households remarks

3) Discussion and adoption of the agenda

4) Allocation of tasks between participants

5) Presentation of time schedule

Acoustic surveys and data

6) Combine and analyse the results of spring and autumn 2011 acoustic surveys and experiments and report to WGBFAS. (ToR a)

7) Status of BIAS standard survey reports.

8) Update the hydroacoustic databases BAD1 and FishFrame. (ToR b)

9) Plan and decide on acoustic surveys and experiments to be conducted in autumn 2012 and spring 2013. (ToR c)

10) Review and update the Baltic International Acoustic Survey (BIAS) manual. (ToR h)

11) Discuss the indices of acoustic surveys based on different methods for combining the data of fishing stations in compilation of acoustic indices and draft recommendations as appropriate. (ToR j)

12) Evaluate the new uncertainty estimates for the BIAS abundance indices derived from a simulation model and draft recommendations as appropriate. (ToR k)

13) Review and update the structure of the BIAS database to incorporate the estimates of two herring stocks in one subdivision. (Rec. by WGBIFS)

14) Evaluate the proportion of WBSS in SD 25 and SD 26 during the BIAS. (Rec. by WGBIFS)

Bottom-trawl surveys and data

15) Discuss the results from BITS surveys performed in autumn 2011 and spring 2012 and review of the upload and development status of DATRAS. (ToR d)

16) Status of BITS standard survey reports.

17) Plan and decide on demersal trawl surveys and experiments to be conducted in autumn 2012 and spring 2013. (ToR e)

18) Update and correct the Tow Database. (ToR f)

19) Review and update the Baltic International Trawl Survey (BITS) manual. (ToR g)

20) Review of new results on the vertical distribution of the cod during the BITS. (ToR i)

21) Evaluate the characteristics of TVL and TVS standard gears used in BITS based on the details gear check according to the BITS manual and provide written documentation of findings. (ToR l)

22) Evaluate the BITS data stored in DATRAS for describing biodiversity in the Baltic Sea covers by BITS in spring and autumn and draft recommendations as appropriate. (ToR m)

23) Coordinate stomach sampling programme in the Baltic International Trawl Survey (BITS). (ToR n)

24) Discuss the suggested new maturity scales for flatfish. (Outcome of WKMSSPDF2)

25) Discuss the suggested increase of the spatial overlap between "Solea" and "Havfisken". (Rec. by WGBFAS)

26) Discuss whether a modification of the BITS survey design would give a better sampling of the older age-classes of cod. (Rec. by WGBFAS)

27) Discuss how to provide standardized time-series of flounder and plaice from the BITS survey. (Rec. by WGBFAS)

28) Discuss the suggested collection and storage of marine litter information in the Baltic International Trawl Survey. (Based on EC's Marine Strategy Framework Directive (MSFD), WKMAL)

Joint acoustic and bottom-trawl survey issues

29) Discuss how to estimate the survey sampling variance. (Rec. by WGMG)

Final issues

30) Agreeing on new ToRs for next meeting

31) Selection of the venue for the next meeting

Recommendations from WGBIFS 2011

Recommendation	For follow up by:
1. WGBIFS agreed that the structure of the BIAS database must be adapted to incorporate the estimates of two herring stocks in one subdivision. A proposal concerning the change of the structure of BIAS should be presented during the next WGBIFS based on a discussion of a subgroup. The discussion will be led by Uwe Böttcher.	WGBIFS
2. WGBIFS proposed that the proportions of WBSS in SD 25 and SD 26 during BIAS should be evaluated based on the available data from the BIAS by means of the presented stock separation function. The results should be presented during the next meeting to assess the importance of mixing of both stocks during BIAS in these subdivisions.	WGBIFS

Recommendations from other expert groups

WGBFAS

79	2011	WGBFAS	WGBIFS is recommended to combine the two survey indices for Western Baltic cod from Solea and KASU, respectively. They are at present covering separate areas. A suggested solution is to increase the spatial overlap between Solea and Havfisken on a permanent basis.
80	2011	WGBFAS	WGBIFS is recommended to consider if a modification of the BITS survey design would give a better sampling of the older age-classes of Western and Eastern cod to be used in the tuning indices calculations.
81	2011	WGBFAS	WGBIFS is recommended to provide standardized time-series of flounder and plaice from the BITS survey.

WGSAM

3. WGBIFS: Provide further written information on questions raised concerning the stomach sampling manual	WGBIFS/IBTSWG

WGMG

2. It is recommended that estimates of survey sampling variance always be calculated. Where appropriate, the inverse of survey estimates of sampling variance should be incorporated as a maximum weighting for corresponding survey data points.	WGISDAA, WGIPS, WKTSBLUES, WGISUR, SGNEPS, WGBIFS, IBTSWG, WKMSPA, WGMEGS, WGBEAM, WGNEACS, ICES Assessment WGs

WKMSSPDF2

- The countries should continue the used of the national scale.
- A break in the time-series concerning the maturity stages is proposed for the Baltic Sea in such a way that old data should stay as they are with a fixed start point onward the new 6 point scale should be used.

Annex 3: Terms of references for the next meeting

The **Baltic International Fish Survey Working Group** (WGBIFS), chaired by Olavi Kaljuste, Sweden, will meet in Tartu, Estonia, 21–25 March 2013 to:

a) Combine and analyse the results of spring and autumn 2012 acoustic surveys and experiments and report to WGBFAS;

b) Update the BIAS and BASS hydroacoustic databases;

c) Plan and decide on acoustic surveys and experiments to be conducted in autumn 2013 and spring 2014;

d) Discuss the results from BITS surveys performed in autumn 2012 and spring 2013 and evaluate the characteristics of TVL and TVS standard gears used in BITS;

e) Plan and decide on demersal trawl surveys and experiments to be conducted in autumn 2013 and spring 2014;

f) Update and correct the Tow Database;

g) Review and update the Baltic International Trawl Survey (BITS) manual;

h) Review and update the manual of International Baltic Acoustic Surveys;

i) Review of new results on the abundance of the pelagic cod;

j) Discuss the indices of acoustic surveys based on different methods for combining the data of fishing stations in compilation of acoustic indices and draft recommendations as appropriate;

k) Review and update the structure of the BIAS database to incorporate the estimates of two herring stocks in one subdivision;

l) Evaluate the proportion of WBSS in SD 25 and SD 26 during the BIAS;

m) Coordinate stomach sampling programme in the Baltic International Trawl Survey (BITS);

n) Evaluate the new information how to estimate the acoustic survey sampling variance.

WGBIFS will report by 15 May 2013 (via SSGESST) for the attention of SCICOM and ACOM.

Supporting information

Priority	The scientific surveys coordinated by this Group provide major fishery-independent tuning information for the assessment of several fish stocks in the Baltic Sea. Consequently, these activities are considered to have a very high priority.

Scientific justification	The main objective of WGBIFS is to coordinate and standardize national research surveys in the Baltic for the benefit of accurate resource assessment of Baltic and Kattegat fish stocks. From 1996 to 2003 attention has been put on evaluations of traditional surveys, introduction of survey manuals and consideration of sampling design and standard gears as well as coordinated data exchange format. Since 1995 activities have been devoted to coordinate international coordinated demersal trawl surveys using the new standard gear TV3. Experiments have revealed the presence of a significant number of cod in the pelagic waters above the reach of the bottom-trawls particularly in areas with oxygen deficiency may bias the stock indices calculated. The issue will be further investigated in the years ahead. The most important future activities are to combine and analyze the time series of tuning indices for the Baltic Fisheries Assessment Working Group, upload disaggregated hydro-acoustic data into the RDB-FishFrame when it has been developed to include the acoustic data, and plan and decide on surveys and experiments to be conducted.
Resource requirements	The research programmes which provide the main input to this group are already underway, and resources are already committed. The additional resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is normally attended by some 15–20 members and guests.
Secretariat facilities	None.
Financial	No financial implications.
Linkages to advisory committees	ACOM: The quality of stock assessments and management advice of Baltic herring, sprat, cod and flatfish stocks.
Linkages to other committees or groups	WGBFAS, WGFAST, SSGSUE.
Linkages to other organizations	No direct linkage to other organizations.

Annex 4: Recommendations

Recommendation	Addressed to
1. WGBIFS recommends that the BIAS-dataset including the data of 2011 can be used in the assessment of the herring and sprat stocks in the Baltic Sea with the restriction that the following years are excluded from the index series: 1993, 1995 and 1997.	WGBFAS
2. WGBIFS is proposing the new tuning fleet (presented in Annex 5; Table 6) for testing in the next benchmark assessment of the Central Baltic herring.	WGBFAS
3. WGBIFS recommends that the BASS-dataset including the data of 2011 can be used in the assessment of the sprat stock in the Baltic Sea.	WGBFAS
4. WGBIFS recommends that the new BIAS index series can be used in the assessment of the Bothnian Sea herring with the restriction that the year 1999 is excluded from the dataset.	WGBFAS
5. WGBIFS recommends that the BITS-indices including the data of older cod (at age 5 and older) can be used in the assessment of the cod stocks in the Baltic Sea without restrictions.	WGBFAS
6. WGBIFS recommends that all BITS stations realized in SD 22 – 24 are used as one unit like it is recommended and agreed by during WGBIFS meetings by all countries. The procedures for estimating stock indices based on the BITS manual are realized in the DATRAS database together with estimation of confidence intervals. In addition, it is necessary that the fishing stations are realized according to the BITS manual.	WGBFAS
7. WGBIFS suggested that same indices calculation algorithm as the one used for cod is used for flatfish if the stock is defined using Subdivision. If this is not the case, each trawl station in BITS has to be allocated to a flounder stock based on trawling position and well defined area definitions for the flounder stocks.	WGBFAS
8. WGBIFS recommends that FishFrame ver. 5.0 is updated in order to include acoustic data from BIAS and BASS. Until complete data compilation is developed in FishFrame ver.5.0, the first step would be to facilitate upload of data allowing FishFrame to act as data deposit for data used for calculating variances of estimates.	ICES data centre
9. WGBIFS recommends not to change the fish species code system within a year; the TSN codes still are valid and cannot be changed by the ICES DATRAS database manger without consultancies with the WGBIFS.	ICES data centre
10. WGBIFS recommends that WGSAM provides detailed information on how to work up the Cod stomach samples and provides a database for storing the data.	WGSAM
11. WGBIFS recommends that different methods and algorithms for deriving a survey sampling variance should be presented by appropriate workgroup (WGMG) to WGBIFS, the advantages and disadvantages of the different methods evaluated and explained in an easy accessible way preferable with attached example files that simplifies the additional work needed by WGBIFS. Furthermore information regarding the merits and demerits of these different methods when used to compare the variance in between different types of surveys is requested.	WGMG

Annex 5: Whole time-series for tuning indices

Table 1. Autumn acoustic (BIAS) tuning fleet index (numbers in millions) for Central Baltic herring (the ICES Subdivisions 25–27, 28.2 and 29).

YEAR	TOTAL	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
1991	58 981	6 739	19 731	11 477	4 029	9 728	2 508	2 295	2 474
1992	46 617	7 445	9 217	13 327	7 256	4 217	2 346	1 595	1 214
1993*	29 157	727	4 661	7 008	8 047	3 697	2 107	1 117	1 793
1994	58 093	3 939	11 992	20 607	11 770	5 804	2 158	965	858
1995*	28 519	4 693	2 279	4 560	6 012	5 385	3 214	1 532	845
1996	44 521	4 000	13 914	10 105	7 435	4 631	2 419	1 213	803
1997*	15 770	1 452	1 561	5 314	3 318	2 214	1 118	475	318
1998	25 338	4 312	2 199	6 717	6 643	2 651	1 558	816	443
1999	20 757	1 762	4 772	3 233	4 293	3 740	1 461	852	643
2000	41 109	10 168	2 571	9 931	4 855	5 226	3 262	3 022	2 073
2001	24 482	4 053	8 242	3 308	4 704	1 583	1 251	869	473
2002	20 977	2 699	4 298	6 581	2 883	2 386	895	763	471
2003	49 940	16 868	9 204	10 887	6 819	2 378	1 812	778	1 193
2004	35 018	4 942	13 388	6 905	4 774	2 539	1 163	613	694
2005	42 352	1 929	8 302	15 543	7 243	4 455	2 604	1 121	1 156
2006	62 947	7 346	8 107	12 793	21 290	7 386	3 095	1 712	1 219
2007	30 020	5 424	6 657	3 025	4 276	7 205	1 724	892	816
2008	34 933	6 756	6 776	7 615	3 677	4 989	3 478	843	798
2009	39 243	6 429	12 300	6 958	5 658	2 107	3 026	2 138	627
2010	38 706	3 855	8 479	12 339	5 139	3 600	1 721	1 939	1 634
2011	44 561	2 342	5 686	11 097	12 808	5 597	3 302	1 459	2 270

*** In the years 1993, 1995 and 1997 the coverage was very poor. It is recommended that these data should not be used.**

Table 2. Autumn acoustic (BIAS) recruitment index (age 0; numbers in millions) for Central Baltic herring (the ICES Subdivisions 25–27, 28.2 and 29).

YEAR	Sum N_corr
1991	10467
1992	1297
1993	589
1994	4916
1995	1214
1996	312
1997	2363
1998	480
1999	2485
2000	1241
2001	1794
2002	11289
2003	7308
2004	1546
2005	4480
2006	1611
2007	11456
2008	7870
2009	3262
2010	1142
2011	9203

Table 3. Autumn acoustic (BIAS) tuning fleet index (numbers in millions) for Baltic sprat (the ICES Subdivisions 24–29).

YEAR	TOTAL	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
1991	150 054	46 989	40 690	43 970	2 637	8 953	1 806	1 936	3 072
1992	104 248	37 345	27 356	24 438	9 433	1 945	2 452	717	563
1993*	101 924	31 432	32 078	16 755	13 164	4 754	1 005	1 520	1 215
1994	138 642	12 557	45 137	43 656	17 478	12 051	5 149	1 034	1 579
1995*	238 711	137 383	16 894	40 591	22 762	11 648	5 789	2 194	1 451
1996	274 611	71 379	133 914	21 098	23 648	12 968	6 493	3 770	1 341
1997*	147 144	9 431	58 497	57 746	8 766	7 888	2 659	1 717	440
1998	234 015	102 572	22 213	56 369	37 065	8 201	4 856	1 675	1 064
1999	198 198	4 904	91 316	16 083	36 201	39 247	5 296	3 364	1 787
2000	156 948	59 895	5 321	51 166	5 753	14 282	16 174	1 599	2 760
2001	109 135	12 224	36 403	6 973	30 796	4 064	9 749	6 477	2 449
2002	121 626	31 811	14 641	37 845	5 831	19 258	2 656	5 167	4 419
2003	216 860	100 928	32 803	24 306	23 675	8 099	13 435	4 867	8 747
2004	203 288	121 935	47 843	11 895	8 053	4 995	2 472	2 454	3 640
2005	207 222	7 200	126 586	49 268	10 179	5 197	3 051	2 392	3 348
2006	206 196	37 280	12 054	105 751	33 052	8 168	4 692	2 167	3 031
2007	122 749	52 489	22 128	8 331	26 627	9 980	1 105	479	1 610
2008	129 253	29 422	45 772	20 500	5 407	19 177	5 765	1 267	1 942
2009	147 439	78 186	25 771	21 329	6 728	4 751	7 197	2 070	1 407
2010	89 272	11 769	52 258	10 916	6 781	1 737	1 995	2 621	1 195
2011	101 308	20 865	11 819	44 250	10 126	6 868	2 671	1 850	2 858

* In the years 1993, 1995 and 1997 the coverage was very poor. It is recommended that these data should not be used.

Table 4. Autumn acoustic (BIAS) recruitment index (age 0; numbers in millions) for sprat (the ICES Subdivisions 26 + 28).

YEAR	Sum N_corr
1993	2221
1994	38555
1995	27810
1996	3287
1997	39334
1998	682
1999	22249
2000	3466
2001	6410
2002	31780
2003	61462
2004	2074
2005	18202
2006	23831
2007	3144
2008	53263
2009	6363
2010	8669
2011	17553

Table 5. Spring acoustic (BASS) tuning fleet index (numbers in millions) for sprat in the ICES Subdivisions 24, 25, 26 and 28.

YEAR	TOTAL	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
2001	111 232,57	8 322,46	36 411,60	13 009,81	37 888,73	5 449,38	4 803,66	4 716,60	630,33
2002	126 776,64	27 439,40	19 132,50	37 184,03	19 103,99	14 974,21	2 546,99	3 710,53	2 684,99
2003	86 865,12	27 313,32	16 661,56	8 513,65	15 855,44	5 667,70	7 364,38	1 719,70	3 769,38
2004	266 051,51	139 812,07	68 117,82	16 020,27	11 114,76	13 050,32	3 296,02	8 068,13	6 572,13
2005	137 452,42	4 402,18	91 313,50	23 822,65	7 312,95	3 592,82	2 827,03	1 873,43	2 307,86
2006	133 843,12	13 783,40	8 242,22	78 850,85	21 525,54	5 846,64	2 008,42	1 570,27	2 015,78
2007	136 189,90	53 027,36	29 437,64	6 506,15	36 975,57	7 691,72	1 291,70	539,63	720,14
2008	104 881,46	9 162,99	41 156,52	20 518,63	5 705,67	21 703,19	4 319,64	776,77	1 538,04
2009	142 985,91	40 705,31	27 208,56	36 819,20	10 775,43	6 505,63	14 493,57	5 469,47	1 008,74
2010	114 559,19	9 431,86	59 855,44	15 426,69	16 098,28	5 128,83	1 681,65	5 628,28	1 308,15
2011	130 984,61	18 647,43	6 940,54	67 501,63	17 020,37	10 795,66	4 147,45	2 441,53	3 490,01

Table 6. Autumn (BIAS) tuning fleet index for Central Baltic herring in the ICES Subdivisions 25–29 (data from SD 29N are excluded).

YEAR	TOTAL	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8
1991	50 952,75	5 739,87	16 983,80	9 174,67	3 833,74	8 619,17	2 172,23	2 095,49	2 333,78
1992	46 617,34	7 445,37	9 216,53	13 327,14	7 255,88	4 216,89	2 346,48	1 595,05	1 213,98
1993	29 157,18	726,92	4 661,31	7 007,96	8 046,79	3 697,01	2 106,52	1 117,29	1 793,39
1994	58 093,25	3 938,70	11 991,80	20 607,32	11 769,54	5 804,38	2 158,06	965,02	858,43
1995	28 518,93	4 693,08	2 279,04	4 559,81	6 012,28	5 384,85	3 213,76	1 531,52	844,59
1996	44 521,04	3 999,69	13 914,40	10 104,97	7 435,34	4 631,15	2 418,60	1 213,43	803,45
1997	15 769,81	1 451,55	1 561,49	5 314,38	3 318,43	2 213,59	1 117,93	474,75	317,68
1998	25 337,79	4 311,82	2 198,70	6 717,32	6 642,76	2 650,69	1 558,03	815,93	442,53
1999	19 933,63	1 719,90	4 423,42	3 049,98	4 151,74	3 694,07	1 437,24	843,11	614,17
2000	17 856,08	2 787,74	1 476,34	5 143,95	1 874,42	2 753,54	2 230,55	961,54	627,99
2001	24 482,41	4 052,87	8 242,00	3 308,27	4 704,27	1 582,66	1 251,08	868,66	472,59
2002	20 976,85	2 699,27	4 298,45	6 581,49	2 883,45	2 385,59	894,71	762,83	471,06
2003	49 939,99	16 868,38	9 204,09	10 886,50	6 819,48	2 378,46	1 812,45	778,05	1 192,58
2004	35 017,88	4 941,52	13 388,18	6 905,25	4 773,54	2 539,14	1 163,23	613,39	693,64
2005	38 900,54	1 559,39	7 562,64	14 077,70	6 858,13	4 186,84	2 450,66	1 061,08	1 144,09
2006	58 868,12	6 351,24	6 980,71	11 794,15	20 856,75	7 005,64	3 034,76	1 679,62	1 165,26
2007	22 819,06	3 404,98	4 695,81	2 377,54	3 759,41	5 663,89	1 429,68	782,74	705,01
2008	30 106,42	5 384,21	5 835,18	6 268,92	3 315,66	4 488,01	3 249,03	809,97	755,42
2009	30 308,68	2 385,30	9 516,96	5 963,86	5 019,16	1 974,44	2 826,44	2 034,94	587,58
2010	31 900,07	2 061,06	6 481,37	10 518,13	4 816,08	3 326,34	1 610,42	1 760,32	1 326,34
2011	38 477,90	1 568,85	3 789,98	9 738,62	11 630,11	5 288,53	3 023,24	1 388,58	2 049,98

* In the years 1993, 1997 and 1995 the coverage was very poor. It is recommended that these data should not be used.

Annex 6: Standard Reports of BITS in quarter 4 in 2011 and quarter 1 in 2012

Extended cruise reports of BITS with more detailed descriptions are summarized in Annex 7.

Nation:	**Denmark**	**Vessel:**	**RV "Dana"**
Survey:	BITS	**Dates:**	01–17/11–2011

Cruise	**4 quarter 2011**
Gear details:	The big (#920) standard TV3 trawl is used. The construction of the trawl follows the specifications in the manual. No rock-hopper was used
Notes from survey (e.g. problems, additional work etc.):	52 stations were fished in total. 50 stations were fished successfully. 1 invalid due to gear damage. 1 could not be fished due to commercial fishing gear at the trawl position.

ICES Sub-Divisions	**Gear (TVL,TVS)**	**Depth strata** (1 -6)	**Number of hauls planed**	**Number of valid hauls realized using "Standard" ground gear**	**Number of valid hauls realized using Rock-hoppers**	**Number of assumed zero-catch hauls**	**Number of replacement hauls**	**Number of invalid hauls**	**Sampling coverrage (% stations fished)**
25	TVL	2 (20–39m)	3	2		1	0	0	100
25	TVL	3 (40–59m)	14	13		2		1	107
25	TVL	4 (60–79m)	22	15		6		1	95
25	TVL	5 (80–99m)	11			11			100
25	TVL	6 (>100m)	50						0

Number of biological samples (maturity and age material, *maturity only):

Species	**Number of otoliths**	**Species**	**Number of otoliths**
Clupea harengus			
Gadus morhua	557		
Sprattus sprattus			

Nation:	Denmark	Vessel:	RV "Havfisken"
Survey:	KASU (BITS)	**Dates:**	31/10–17/11- 2011

Cruise	4th quarter
Gear details:	The small (#520) standard TV3 trawl is used. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	Some stations were moved due to problems with stones or other problems at the stations. Station 22017, 22019, 22102, 22120 and 22121 are substituted with other stations in same depth strata.

ICES Sub -Divisions	Gear (TVL,TVS)	Depth strata (1 -6)	Number of hauls planed	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
22	TVS	1(10–40m)	19	19	0	0	5	0	100%
23	TVS	1(10–40m)	3	3	0	0	0	0	100%
21	TVS	1(10–40m)	25	25	0	0	0	0	100%
20	TVS	1(10–40m	2	2	0	0	0	0	100%

Number of biological samples (maturity and age material, *maturity only):

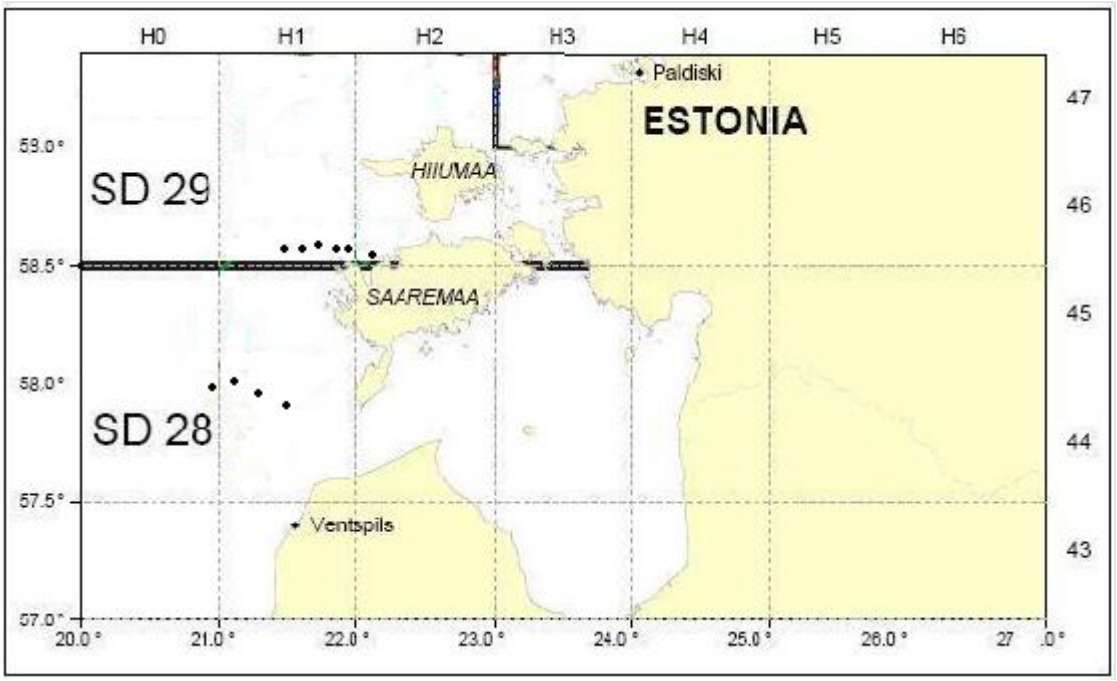
Species	Age	Species	Age
Clupea harengus			
Gadus morhua			
Pleuronectes platessa			
Solea solea			

Nation:	Estonia	Vessel:	RV "CEV"
Survey:	BITS11IVQ	Dates:	22–23 November 2011

Cruise	
Gear details:	The small (530) standard TV3 trawl was used. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	No major problems were encountered during the survey. Total 9 hauls were performed. The weather conditions (windspeed >15 m/s) did not allow to perform the deepest planned trawl haul in the SD 29. The information on weather conditions during the survey period can be found in http://www.ilm.ee/index.php?49542

ICES Subdivisions	Gear (TVL,TVS)	Depth strata (1–6)	Number of hauls planed	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
28	TVS	40–59m	1	1	0	0	0	0	100
28	TVS	60–79m	2	2	0	0	0	0	100
28	TVS	80–99m	1	1	0	0	0	0	100
29	TVS	20–39m	1	1	0	0	0	0	100
29	TVS	40–59m	2	3	0	0	0	0	100
29	TVS	80–99m	1	0	0	0	0	0	100

Number of biological samples (maturity and age material, *maturity only):		
Species	Age	Length
Gadus morhua	155	155
Clupea harengus	229	1346
Sprattus sprattus	102	1706
Platichthys flesus	298	475

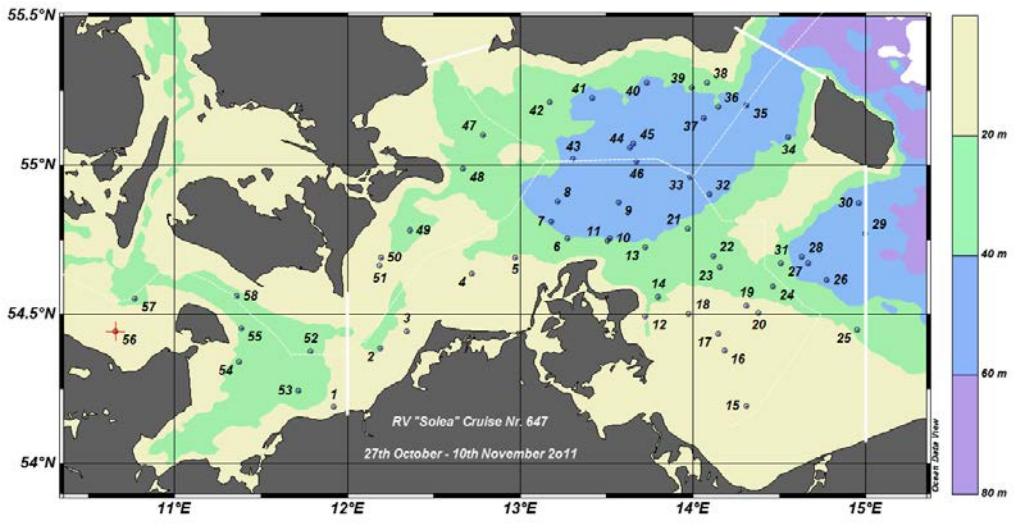

H0
H1
H2
H3
H4
H5
H6
Paldiski
ESTONIA
SD 29
HIIUMAA
SAAREMAA
SD 28
Ventspils
59.0°
58.5°
58.0°
57.5°
57.0°
20.0°
21.0°
22.0°
23.0°
24.0°
25.0°
26.0°
47
46
45
44
43

Nation:	Germany	Vessel:	RV "Solea"
Survey:	BITS 2011, quarter 4	Dates:	27 October – 10 November 2011

Cruise	
Gear details:	The small (520#) standard TV3 trawl was used. All Tow Database stations are fished without rock-hoppers. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	Total 58 fishing hauls and 58 hydrographical stations were performed.
Additional comments:	

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (2–6)	Number of hauls planed	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
22	TVS	1	8	8			-	-	100
24	TVS	1	24	24			-	-	100
24	TVS	2	26	26			-	-	100

Number of biological samples (maturity and age material, *maturity only):		
Species	Length	Age
Gadus morhua	8364	1086
Platichthys flesus	5943	911
Limanda limanda	5893	677
Pleuronectes platessa	6750	766
Psetta maxima	259	259
Scophthalmus rhombus	6	6
Clupea harengus	8450	-
Sprattus sprattus	7743	-



Nation:	Latvia	Vessel:	RV "Baltica"
Survey:	BITS 2011, quarter 4	Dates:	06–15 December 2011

Cruise	
Gear details:	The big (930#) standard TV3 trawl with rock-hoppers was used. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	Due to bad weather conditions during the survey 20 (80%) of planed tracks were realized only
Aditional comments:	

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–5)	Number of hauls planed	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
25	TVL	2	1		0	0	0	0	0
25	TVL	3	1		0	0	0	0	0
26	TVL	1	1		1	0	0	0	100
26	TVL	2	3		2	0	0	1	67
26	TVL	3	3		2	1	0	0	67
26	TVL	4	2		2	2	0	0	100
26	TVL	5	3		2	2	0	0	67
28	TVL	1	3		2	0	0	0	67
28	TVL	2	2		2	0	1	0	100
28	TVL	3	1		2	0	0	0	200
28	TVL	4	5		5	3	0	0	100

Number of biological samples (maturity and age material, *maturity only):		
Species	Length	Age
Gadus morhua	2755	385
Platichthys flesus	1613	183
Clupea harengus	902	
Sprattus sprattus	647	
Psetta maxima	37	34
Pleuronectes platessa	6	
Zoarces viviparus	14	
Cyclopterus lumpus	5	
Pomatoschistus minutus	78	
Myoxocephalus scorpius	61	
Osmerus eperlanus	85	
Gasterosteus aculeatus	17	
Liparis liparis	2	
Enchelyopus cimbrius	4	
Hyperoplus lanceolatus	5	
Taurulus bubalis	2	

Nation:	Lithuania	Vessel:	RV "Darius"
Survey:	BITS 2011, quarter 4	**Dates:**	20 – 22 December 2011

Cruise	
Gear details:	The small (530) standard TV3 trawl was used. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	The weather was very bad, so the survey didn't make in time. Total 8 trawls were made. Tree hauls was incorrect, because trawl was destroyed to rocks.
Additional comments:	

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–5)	Number of hauls planed	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
26	TVS	1	1	1	0	0	0	0	100
26	TVS	2	2	0	0	0	0	2	0
26	TVS	3	5	4	0	0	0	1	80
28	TVS	4	0	0	0	0	0	0	0

Number of biological samples (maturity and age material, *maturity only):			
Species	Length	Maturity	Age
Gadus morhua	1857	439	439
Platichthys flesus	735	215	215
Pleuronectes platessa	4	4	4
Psetta maxima	5	5	5
Clupea harengus	111		
Sprattus sprattus	5		
Alosa fallax	8		
Osmerus eperlanus	119		
Myoxocephalus scorpius	2		
Pomatoschistus minutus	40		

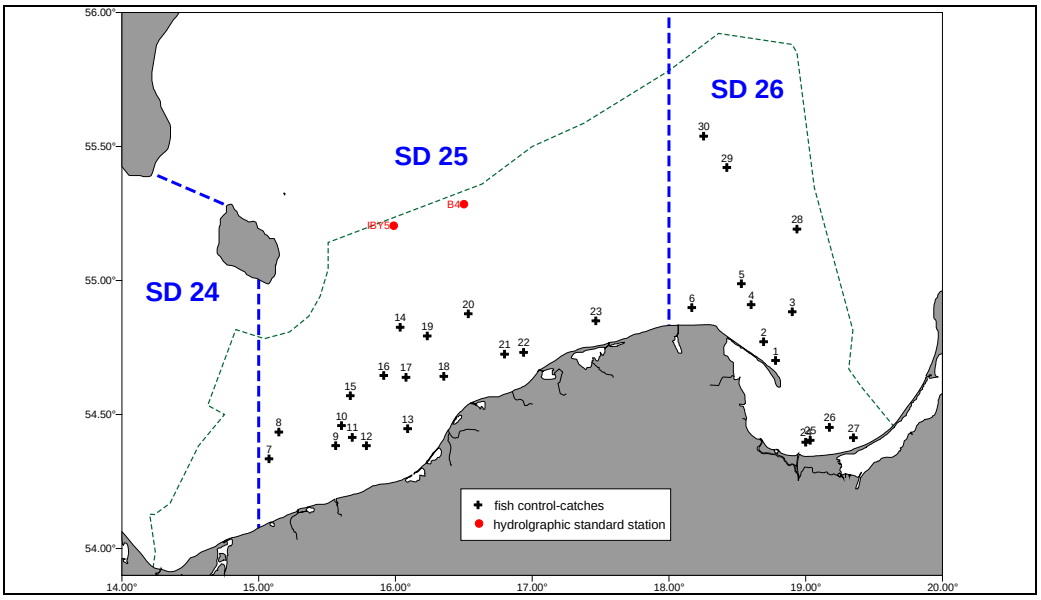
Nation:	Poland	Vessel:	RV "Baltica"
Survey:	BITS 2011, quarter 4	Dates:	19–30 November 2011

Cruise	No. 17/2011/MIR
Gear details:	The large TV-3#930 trawl was used. All fish control-hauls were carried out with standard rigging trawl. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	Totally 28 representative catch-stations was accomplished. Two others control-hauls can be considered as not representative, because of partly damaged net (haul No. 25014), and in the case of haul No. 26087 - due to a low oxygen content (0.48 ml/l) in the bottom zone, i.e. below recommended threshold level (≥1.5 ml/l) for the BITS surveys. The trawling position of three hauls (Nos. 25013, 25014, 26172) was modified, and in the case of a last one mentioned the new location is recommended to the ICES Tow-Database, because the originally selected position was to close to the gas and petroleum drilling ring. The seawater temperature and salinity were measured in the whole water column at 27 fish catch-stations and two additional standard hydrographic stations, and oxygen content was determined totally at 25 stations. The Neil-Brown CTD-probe combined with the rosette sampler (the bathometer rosette) was applied for the STD measurements. Oxygen content was determined by the standard Winkler's method.
Additional comments:	

Stations fished
(Please insert line according to your needs)

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–5)	Number of hauls planed	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
25	TVL	1	11	10	-	-	2	1	100
25	TVL	2	5	5	-	-	-	-	100
25	TVL	3	1	1	-	-	-	-	100
26	TVL	1	4	4	-	-	-	-	100
26	TVL	2	3	3	-	-	-	-	100
26	TVL	3	3	2	-	-	-	-	67
26	TVL	4	4	3	-	-	1	1	100

Number of biological samples (maturity and age material, *maturity only):		
Species	Length	Age
Gadus morhua	4501	448
Platichthys flesus	790	295
Clupea harengus	5211	956
Sprattus sprattus	4023	300
Pleuronectes platessa	200	125
Psetta maxima	6	6
Ammodytes lanceolatus	314	-

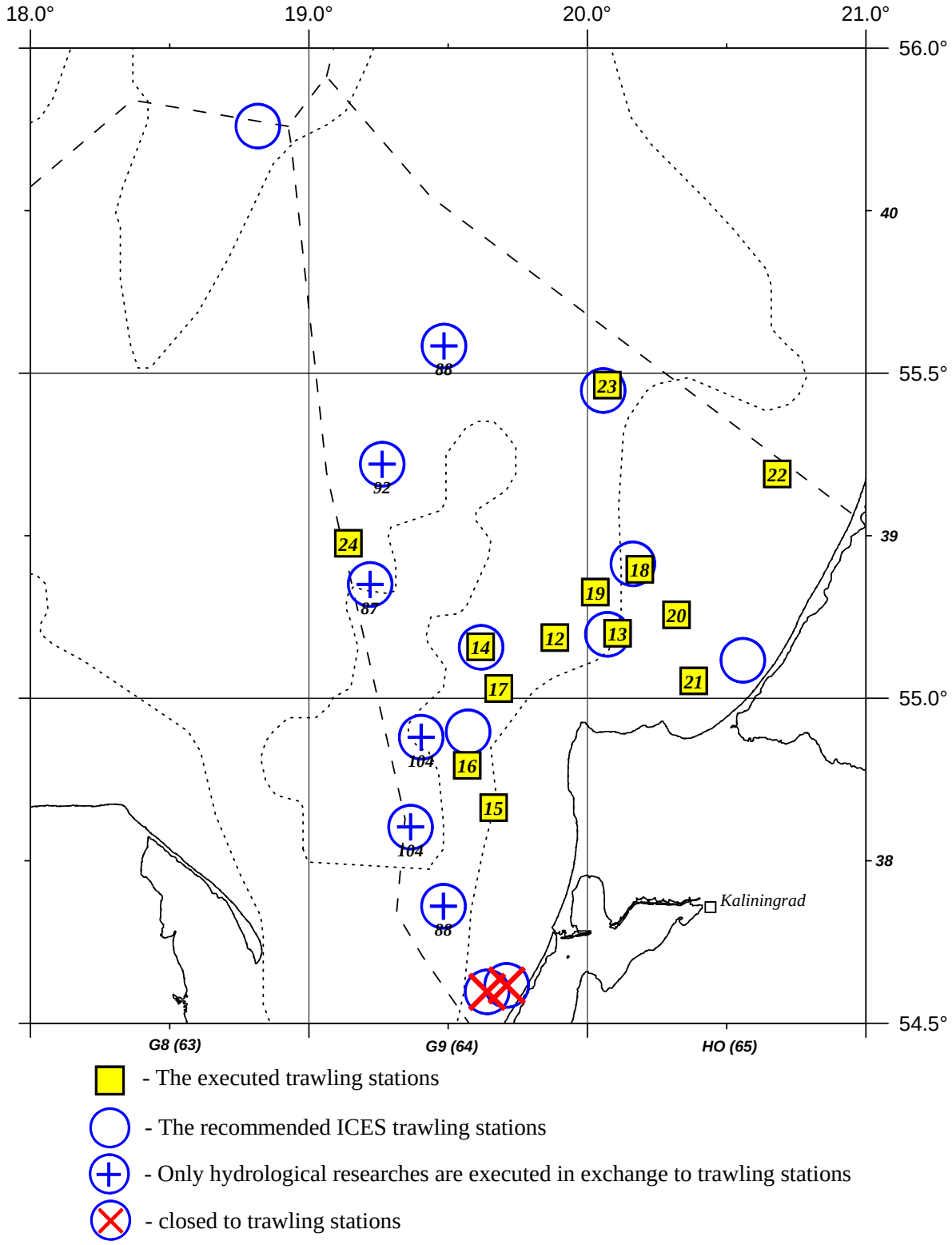

SD 24
SD 25
SD 26
BY5
B4
fish control-catches
hydrolgraphic standard station
56.00°
55.50°
55.00°
54.50°
54.00°
14.00°
15.00°
16.00°
17.00°
18.00°
19.00°
20.00°

Nation:	Russia	Vessel:	RV "Atlantniro"
Survey:	BITS 2011, quarter 4	**Dates:**	23 – 28 October 2011

Cruise	
Gear details:	The large standard TV3 trawl is used. Following the recommendations in the TOW database stations are fished either without rock-hoppers. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	No problems were experienced during the survey. Four additional trawl stations have been made. Low content of oxygen in six trawl stations 26154 (depth 88 m), 26135 (depth 104 m), 26084 (depth 88 m), 26130 (depth 104 m), 26152 (depth 92 m), 26108 (depth 87 m) – therefore hydrological researches have been made only. To replace the trawl station 26108 (depth 87 m) trawl station 26095 (depth – 84 m) was made.
Additional comments:	The national scientific program causes performance of trawl stations 26042, 26036, 26039, 26024 – Russia. These trawl stations have been made in addition to the planned BITS stations. Trawl stations 26023 and 26128 has been made instead of 26017, 26146– military zone (break down). Trawl station 26138 – not done – Poland zone.

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–5)	Number of hauls planed	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replace-ment hauls	Number of invalid hauls	% stations fished
26	TVL	1	2	2	0	0	1	0	100
26	TVL	2	3	4	0	0	1	0	133
26	TVL	3	1	4	0	0	0	0	400
26	TVL	4	6	3	0	1	1	0	50
26	TVL	5	3	0	0	0	0	0	0

Number of biological samples (maturity and age material, *maturity only):			
Species	Length	Maturity	Age (otoliths)
Gadus morhua	1421	708	511
Platichthys flesus	640	371	342
Clupea harengus	2574	469	469
Sprattus sprattus	628	50	50
Psetta maxima	9	9	9



Trawl positions for RV "ATLANTNIRO" in October 2011

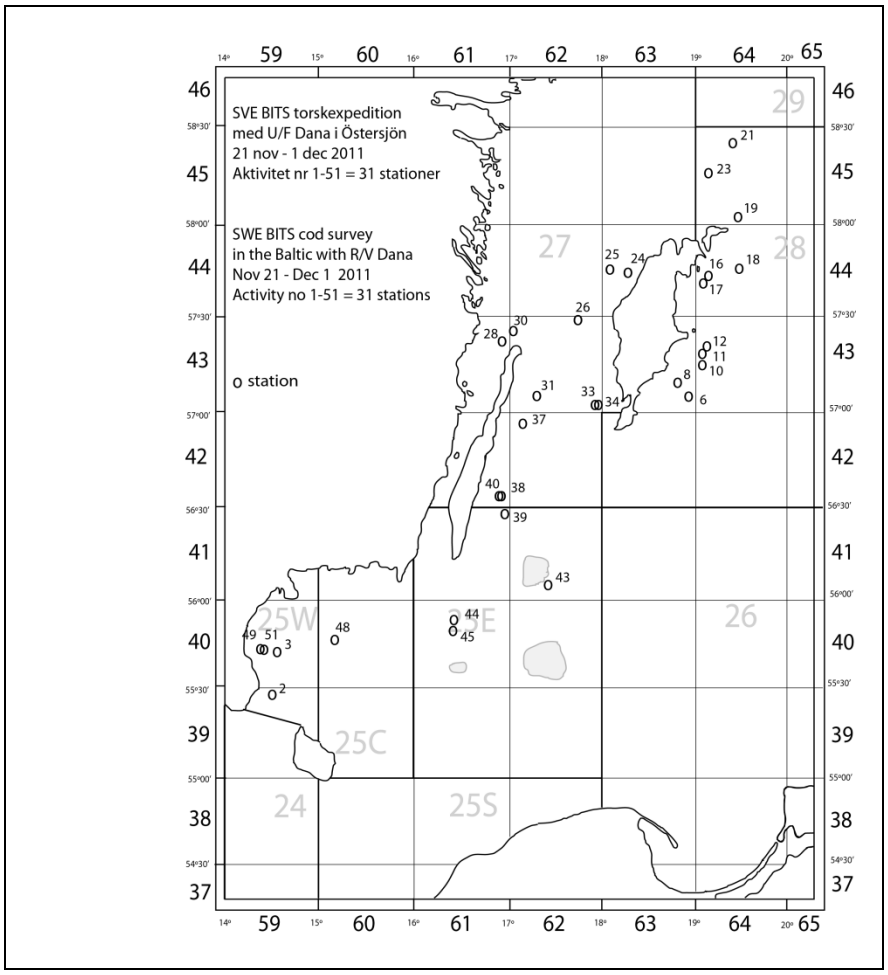
Nation:	SWEDEN	Vessel:	RV "DANA"
Survey:	BITS Q4 2011	Dates:	21 November - 02 December 2011

Cruise	
Gear details:	The large (930#) standard TV3 trawl was used. No tows are done with the rock-hopper groundgear on harder ground stations. The trawl construction is according to the specification in the BITS manual.
Notes from survey (e.g. problems, additional work etc.):	30 haul stations out of the 30 allocated were trawled. We used RV Dana due to that RV Argos is out of service (since Jan 2011).
Aditional comments:	

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–5)	Number of hauls planned	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
25	TVL	1	2	2			1		100
25	TVL	2	6	6			3		100
25	TVL	3	1	1		1			100
27	TVL	2	2	2					100
27	TVL	3	4	4		2			100
27	TVL	4	1	1		1			100
27	TVL	5	3	3		3			100
28	TVL	1	1	3					300
28	TVL	2	3	1					33
28	TVL	3	2	2					100
28	TVL	4	5	5		3			100

Remark: The 2 stations not fished in SD 28 41–60 m have depth of 40 m.

NUMBER OF BIOLOGICAL SAMPLES (MATURITY AND AGE MATERIAL, *MATURITY ONLY):		
SPECIES	**Length**	**Age**
Gadus morhua	3648	601
Anguilla anguilla	1	
Clupea harengus	4178	
Cyclopterus lumpus	7	
Enchelyopus cimbrius	30	
Engraulis encrasicolus	1	
Gadus morhua	5658	
Gasterosteus aculeatus	192	
Limanda limanda	9	
Melanogrammus aeglefinus	2	
Merlangius merlangus	26	
Myoxocephalus quadricornis	333	
Myoxocephalus scorpius	63	
Osmerus eperlanus	2	
Pholis gunnellus	1	
Platichthys flesus	2222	852
Pleuronectes platessa	322	
Pomatoschistus minutus	2	
Psetta maxima	24	
Pungitius pungitius	2	
Sprattus sprattus	2389	
Trachurus trachurus	1	
Zoarces viviparus	73	



Trawl positions for RV "DANA" from 21 November – 02 December 2011.

Nation:	Denmark	Vessel:	RV "Dana"
Survey:	BITS 2012, quarter 1	Dates:	5–20 March 2012

Cruise	
Gear details:	The big (#920) standard TV3 trawl is used. The construction of the trawl follows the specifications in the manual. No rock-hopper was used
Notes from survey (e.g. problems, additional work etc.):	54 stations were fished in total. 54 stations were fished successfully. 3 of those stations were invalid due to gear damage. 2 could not be fished due to commercial fishing gear at the trawl position.
Additional comments	

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–5)	Number of hauls planed	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock hoppers	Number of assumed zero-catch hauls	Number of replace-ment hauls	Number of invalid hauls	% stations fished
25	TVL	1	3	3	0	0	0	0	100
25	TVL	2	9	10	0	0	0	0	111
25	TVL	3	30	30	0	0	3	0	100
25	TVL	4	11	11	0	0	0	0	100

Number of biological samples (maturity and age material, *maturity only):

Species	Age	Species	Age
Clupea harengus	?		
Gadus morhua	2492		
Sprattus sprattus	?		

Nation:	Denmark	Vessel:	RV "Havfisken"
Survey:	KASU1	Dates:	27/2–15/3 - 2012

Cruise	
Gear details:	The small (#520) standard TV3 trawl is used. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	3 stations were moved due to problems with stones or other problems at the stations. Stations 22017–22105–22120 are moved to other stations in same depth strata. 1 invalid station in subdivision 22.

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1 -6)	Number of hauls planed	Number of valid hauls realized using "Stan-dard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of as-sumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
22	TVS	1(10–40m)	19	18	0	0	3	1	95%
23	TVS	1(10–40m)	3	3	0	0	0	0	100%
21	TVS	1(10–40m)	25	26	0	0	0	0	100%
20	TVS	1(10–40m)	2	2	0	0	0	0	100%

Number of biological samples (maturity and age material, *maturity only):

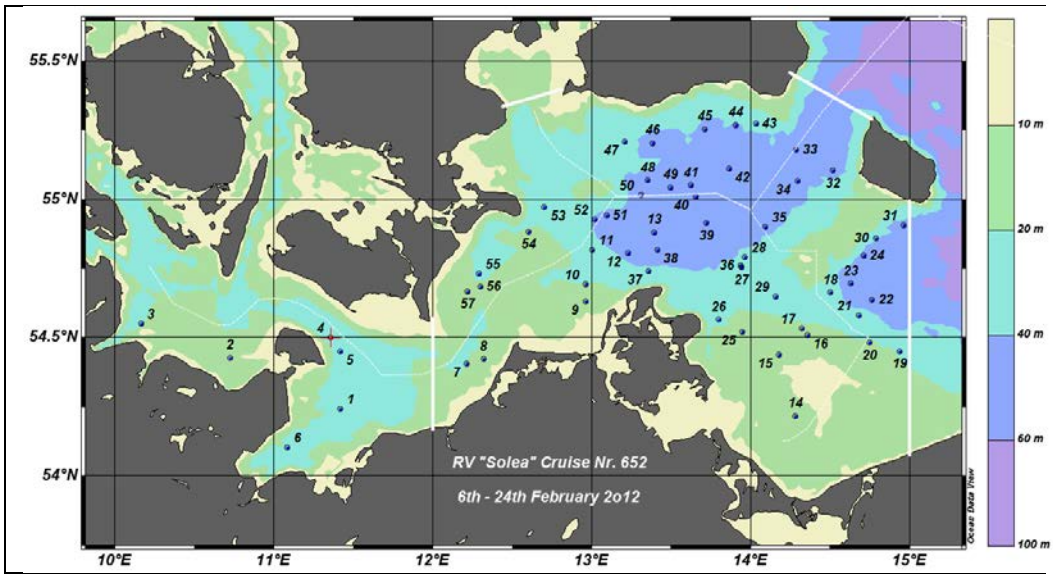
Species	Age	Species	Age
Clupea harengus			
Gadus morhua			
Pleuronectes platessa			
Solea solea			

Nation:	Germany	Vessel:	RV "Solea"
Survey:	BITS Q1 2012	Dates:	06/02– 24/02/2012

Cruise	
Gear details:	The small (520#) standard TV3 trawl was used. All Tow Database stations are fished without rock-hoppers. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	Total 57 fishing hauls and 56 hydrographical stations were performed.
Aditional comments:	

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (2–6)	Num-ber of hauls planed	Number of valid hauls realized using "Stan-dard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of as-sumed zero-catch hauls	Number of re-place-ment hauls	Number of inva-lid hauls	stations fished
22	TVS	10–19 m	0	0			-	-	-
22	TVS	20–29 m	6	6			-	-	100
24	TVS	10–19 m	9	9			-	-	100
24	TVS	20–29 m	10	10			-	-	100
24	TVS	30–39 m	5	5			-	-	100
24	TVS	40–49 m	24	24			-	-	100
24	TVS	50–59 m	3	3			-	-	100

Number of biological samples (maturity and age material, *maturity only):		
Species	Length	Age
Gadus morhua	8432	1345
Platichthys flesus	2692	629
Limanda limanda	1548	665
Pleuronectes platessa	2514	709
Psetta maxima	35	35
Scophthalmus rhombus	2	1
Clupea harengus	6735	-
Sprattus sprattus	4864	-


55.5°N
55°N
54.5°N
54°N
10°E
11°E
12°E
13°E
14°E
15°E
RV "Solea" Cruise Nr. 652
6th - 24th February 2012
10 m
20 m
40 m
60 m
100 m

Nation:	Latvia	Vessel:	RV "Baltica"
Survey:	BITS 2012, quarter 1	Dates:	06–13 March 2012

Cruise	
Gear details:	The big (930#) standard TV3 trawl with rock-hoppers was used. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	The RV"Baltica" realized all 25 planed bottom-trawl control-hauls. Two additional trawls were made in SD 26, in Lithuania EEZ. Six hauls were not performed due to low oxygen concentration (below 1 ml/l) near bottom. Location of one planned bottom haul (No 28007) was replaced with haul (N 28008), due to not correct information between tracks coordinates and depth in these positions. New track position was on the same depth and ICES rectangle as the planned one
Aditional comments:	

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–5)	Number of hauls planed	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
26	TVL	3	1	0	3	0	0	0	300
26	TVL	4	1	0	1	0	0	0	100
26	TVL	5	2	0	2	2	0	0	100
28	TVL	1	3	0	3	0	0	0	100
28	TVL	2	7	0	6	0	1	0	86
28	TVL	3	6	0	6	1	0	0	100
28	TVL	4	5	0	6	3	0	0	120

Number of biological samples (maturity and age material, *maturity only):		
Species	Length	Age
Gadus morhua	779	335
Platichthys flesus	3867	460
Clupea harengus	1811	
Sprattus sprattus	1632	
Psetta maxima	15	14
Pleuronectes platessa	5	
Zoarces viviparus	67	
Cyclopterus lumpus	16	
Pomatoschistus minutus	9	
Myoxocephalus scorpius	114	
Osmerus eperlanus	162	
Gasterosteus aculeatus	21	
Alosa alosa	11	
Enchelyopus cimbrius	3	
Merlangius merlangus	1	

Nation:	Lithuania	Vessel:	RV "Darius"
Survey:	BITS 2013, quarter 1	**Dates:**	06 – 08 March 2012

Cruise	
Gear details:	The small (530) standard TV3 trawl was used. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	Total 8 trawls were made. 1 hauls was incorrect, because trawl was destroyed to rocks.
Additional comments:	

Stations fished
(Please insert line according to your needs)

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–5)	Number of hauls planed	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replace-ment hauls	Number of invalid hauls	% stations fished
26	TVS	2	2	2	0	0	0	0	100
26	TVS	3	4	4	0	0	0	0	100
28	TVS	4	2	1	0	0	0	1	50

Species	Length	Maturity	Age
Gadus morhua	113	439	439
Platichthys flesus	833	230	230
Pleuronectes platessa	3	3	3
Psetta maxima	2	2	2
Clupea harengus	978		
Sprattus sprattus	1450		
Alosa fallax	15		
Osmerus eperlanus	253		
Myoxocephalus scorpius	11		
Pomatoschistus minutus	1		
Cyclopterus lumpus	3		
Neogobius melanostomus	1		

Nation:	Poland	Vessel:	RV "Baltica"
Survey:	BITS 2012, quarter 1	Dates:	13 February – 03 March 2012

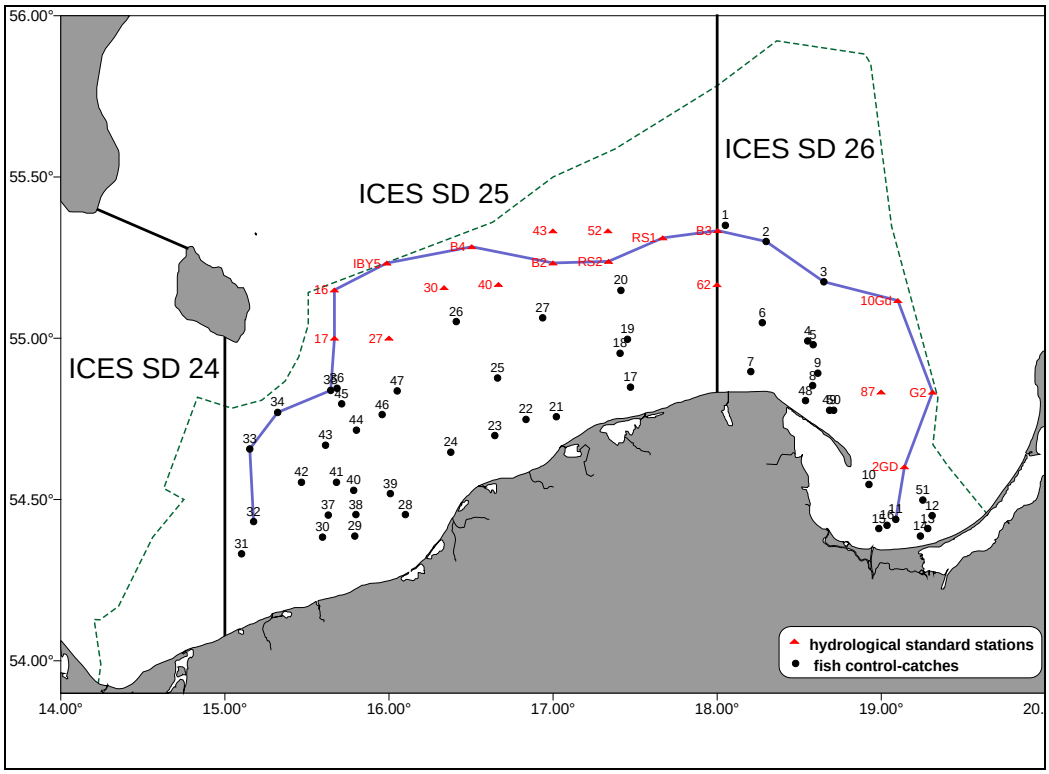
Cruise	No. 2/2012/MIR
Gear details:	The large TV-3#930 trawl was used. All fish control-hauls were curried out with standard rigging trawl. The construction of the trawl follows the specifications in the manual.
Notes from survey (e.g. problems, additional work etc.):	Accordingly, to the WGBIFS plans (Anon, 2011), and some modification made on the beginning of 2012, the Polish vessel was recommended to cover parts of the ICES Subdivisions 25 and 26 with respectively, 30 and 19 randomly selected control-hauls, including three hauls previously designated to the Russian vessel inside the Polish EEZ (ICES SD 26). The RV "Baltica" realized totally 51 bottom-trawl catch-stations in the Polish EEZ, i.e. all from planned by WGBIFS, including two additional hauls (Nos. 20 and 51) devoted "desperately" searching for cod, needed for different types of analyses. In the sum of 51 hauls, one No. 26093, due to lack of oxygen was only initiated by hydrological parameters measurement. Other haul No. 25060, which accordingly to the originally selected position was very close (in the distance of about 1.2 NM) to the haul No. 25061, was shifted to the neighbouring area, very dense aggregation of commercial fishing fleet (about 40 cutters) was operated. The catch-stations Nos. 25010 and 25042 due to considerably damaged of fishing gear can be considered as not representative. Overall, 29 and 19 catch-stations curried out in the ICES Subdivisions 25 and 26 can be considered as representative. Overall, 47 fish catch-stations starting positions and 19 additional standard hydrographic stations were controlled by the Neil-Brown CTD-probe combined with the rosette sampler (the bathometer rosette) for the seawater temperature, salinity and oxygen content determination. Oxygen content was determined by the standard Winkler's method.
Additional comments:	Two additional hauls were accomplished – one in ICES SD 25 and one in ICES SD 26.

Stations fished
(Please insert line according to your needs)

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–5)	Number of hauls planed	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
25	TVL	1	14	13	-	-	-	1	100
25	TVL	2	9	9	-	-	-	1	100
25	TVL	3	6	6	-	-	-	1	100
25	TVL	4	1	1	-	-	1	-	100
26	TVL	1	6	6	-	-	-	-	0
26	TVL	2	5	6	-	-	-	-	100
26	TVL	3	6	6	-	-	-	-	120
26	TVL	4	2	2	-	1	-	-	100

NUMBER OF BIOLOGICAL SAMPLES (MATURITY AND AGE MATERIAL, *MATURITY ONLY):		
SPECIES	Length	Age
Gadus morhua	3444	499
Platichthys flesus	1173	333
Clupea harengus	5737	966
Sprattus sprattus	3914	455
Pleuronectes platessa	146	114
Psetta maxima	5	5

Location of the fish control-catches and the hydrological stations connected with the hauls starting position (black points Nos. 1–51) and the standard hydrographic stations (red triangles) as well as the research hydrological profile (blue line), determined in the Polish EEZ (green dashed line) inspected by the RV "Baltica" during the BITS-1Q/2012 survey.



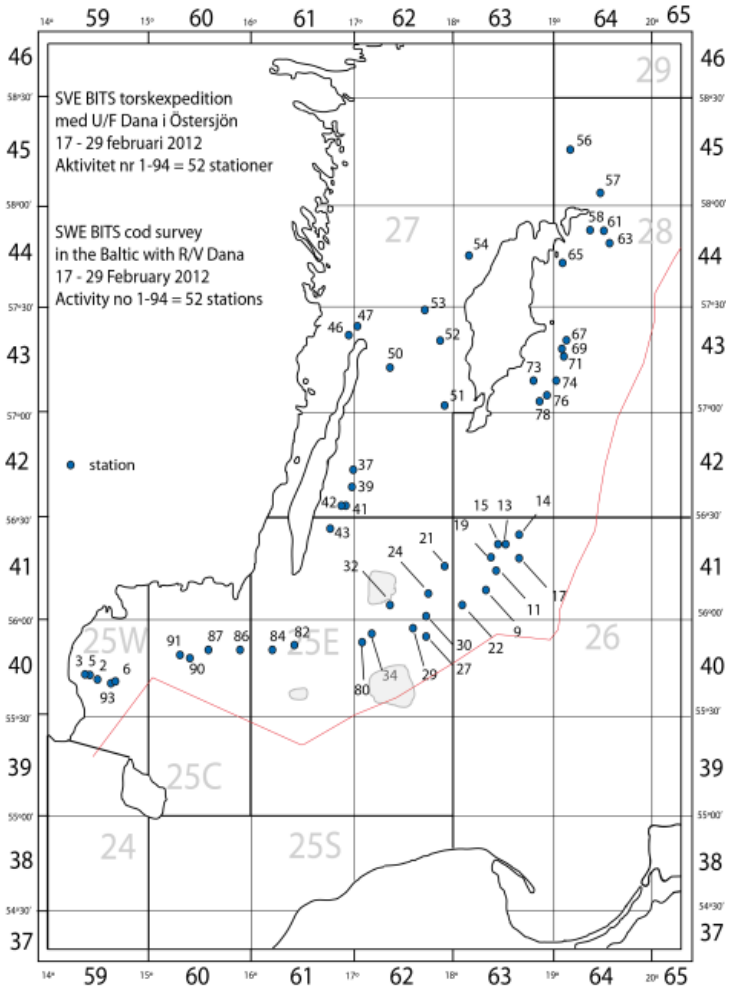
Nation:	SWEDEN	Vessel:	RV "DANA"
Survey:	BITS 2012, quarter 1	Dates:	17–29 February 2012

Cruise	
Gear details:	The large (930#) standard TV3 trawl was used. No tows are done with the rock-hopper groundgear on harder ground stations. The trawl construction is according to the specification in the BITS manual.
Notes from survey (e.g. problems, additional work etc.):	50 haul stations out of the 50 allocated were trawled.
Aditional comments:	

ICES Sub-Divisions	Gear (TVL, TVS)	Depth strata (1–5)	Number of hauls planned	Number of valid hauls realized using "Standard" ground gear	Number of valid hauls realized using Rock-hoppers	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
25	TVL	1	2	2					100
25	TVL	2	14	17			1	1	121
25	TVL	3	4	1					25
26	TVL	1	1	1					100
26	TVL	2	3	3					100
26	TVL	3	3	3		1	1		100
26	TVL	5	1	1		1			100
27	TVL	2	2	2					100
27	TVL	3	4	4					100
27	TVL	4	1	1		1			100
27	TVL	5	3	3		3			100
28	TVL	1	1	1					100
28	TVL	2	3	3					100
28	TVL	3	3	4					133
28	TVL	4	5	4		2	1	1	80

Remarks: % figures other than 100% is dependent on stations with depth close to depth strata limit.

NUMBER OF BIOLOGICAL SAMPLES (MATURITY AND AGE MATERIAL, *MATURITY ONLY):		
SPECIES	Length	Age
Clupea harengus	7994	
Cyclopterus lumpus	40	
Enchelyopus cimbrius	1	
Gadus morhua	4698	877
Gasterosteus aculeatus	183	
Gobiidae	11	
Limanda limanda	14	
Liparis liparis	3	
Lumpenus lampretaeformis	1	
Merlangius merlangus	5	
Myoxocephalus quadricornis	336	
Myoxocephalus scorpius	496	
Platichthys flesus	4928	1306
Pleuronectes platessa	275	
Pomatoschistus	4	
Psetta maxima	28	
Pungitius pungitius	8	
Spinachia spinachia	2	
Sprattus sprattus	3967	
Zoarces viviparus	48	



Trawl positions for RV "DANA" from 17–29 February 2012.