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

22–26 March 2010

Klaipeda, Lithuania

ICES International Council for the Exploration of the Sea

CIEM Conseil International pour l'Exploration de la Mer

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Executive summary

The ICES Working Group on Baltic International Fish Surveys (WGBIFS) met at Lithuanian Fisheries Research Laboratory, Klaipeda, Lithuania 22–26 March 2010 to compile the survey results from second half of 2009 and first half of 2010 and to coordinate and plan the schedule for surveys in second half of 2010 and first half of 2011. Furthermore, the common survey manuals were updated according to decisions made during the meeting. All fish stock assessment relevant surveys in the Baltic and the Kattegat area with international participation (both bottom-trawl surveys and acoustic surveys - eight in total) are coordinated. The number of participants was 19 including eight countries around the Baltic Sea. The group was chaired by Henrik Degel, Denmark.

The results of the standard data compilation can be found under the relevant sections for bottom-trawl and acoustic surveys respectively. More extensive and basic results of acoustic surveys are given in Annex 5. A comprehensive scrutinizing of the acoustic indices back to 1991 was made. Discrepancies between old and revised indices were identified and commented.

A number of additional issues were discussed during the meeting. Previously it has been verified that a significant number of cod is in the pelagic out of reach for the bottom-trawl. Very little is known about the dynamic of this fraction of the cod stock. Is it at fixed fraction of the stock? Are the biological characteristics of the fraction similar to the characteristics of the bottom fraction? Is the pelagic fraction influenced by the extent of the oxygen depleted areas? The data series produced by the bottom surveys can be seriously biased depending on the answer on those questions. It was agreed to go on carry out the analysis according to the agreed plan. The original planed comparable hauls between bottom-trawling and pelagic trawling and the compare of trawl- and acoustic results has not been carried out because of practical problems. Never the less, the participant countries will continue to record acoustic data during mid water trawling in areas with oxygen deficiency and data will be further analyzed in order to investigate the possibility to incorporate BIAS survey cod data into cod index. A restructure of the surveys in Kattegat was discussed and linked together with the wish of a better coverage of the Western Baltic area. The results of the comparable hauls between RV "Solea" and RV "Havfisken" during 4th quarter 2009 were presented and revealed no difference in fishing power of the two research vessels. A literature study has been done in order to obtain values for target strength of less important but occasionally frequent specimens caught during acoustic surveys. The results have not been encouraging as no additional information was identified. The planned discussion of the suggested improved method for calculating acoustic indices by including a simulation model in the calculations was postponed to next year as no new evidence were available.

1 Opening of the meeting

The meeting took place in Klaipeda, Lithuania from 22 March to 26 March 2010. The meeting was opened by the Chair at 10 am. The Chair welcomed the participants and Romas Statkus and Marijus Spegys from the Lithuanian Fisheries Research Laboratory welcomed again and informed the participants about the house rules.

The Terms of Reference for the meeting were:

The Baltic International Fish Survey Working Group (WGBIFS), chaired by Henrik Degel, Denmark will meet in Klaipeda, Lithuania, 22–26 March 2010 to:

a) Combine and analyse the results of spring and autumn 2009 acoustic surveys and experiments and report to WGBFAS;

b) Update the hydro acoustic databases BAD1 and FishFrame for the years 1991 to 2009;

c) Plan and decide on acoustic surveys and experiments to be conducted in 2010 and 2011;

d) Discuss the results from BITS surveys performed in autumn 2009 and spring 2010;

e) Plan and decide on demersal trawl surveys and experiments to be conducted in autumn 2010 and spring 2011;

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) Review of the upload and development status of DATRAS and FishFrame;

k) Discuss the descriptions and the documentation of various methods for weighting procedures when combining hauls in compilation of acoustic indices;

l) Evaluating the new results of uncertainty estimates of the BIAS abundance indices applying simulation model.

WGBIFS will report by 15 May 2010 (via SSGESST) for the attention of SCICOM, WGISUR, and ACOM.

2 Adoption of the agenda and organization of the meeting

The agenda was presented by the chair together with a "Task list" based on the agenda and the requests directed to WGBIFS from other groups. The agenda (Annex 2) was adopted without any changes. To each task one person was assigned as "Text responsible".

Two subgroups were formed; the first one dealing with demersal trawl survey issues and the other one dealing with issues related to acoustic surveys. Plenary were held whenever needed and always before the end of each meeting day.

3 Combine and analyse the results of the 2009 acoustic surveys and experiments and report to WGBFAS

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

In 2009 the following acoustic surveys were conducted between September and November:

VESSEL	COUNTRY	AREA
Argos	Sweden	27 and parts of 25, 26, 28, 29
Argos	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

Stock indices of herring and sprat by age groups of the different cruises are stored in the database BAD1. The standard cruise reports are presented in Annex 6 using the standard format (ICES CM 2002/G:05 Ref. H, Annex 5).

3.1.1 Area under investigation and overlapping areas

Each statistical rectangle of the area under investigation was allocated to one country during the meeting in 2005, thus each country has a mandatory responsible area. That means that area shall be investigated by about 60 miles and at least two controls hauls. However, it is allowed for all nations to cover also other areas, but it is the results from the responsible country are used if data are available. During the BIAS investigations in 2009, rectangles 39G9 and 49G9 in SD26 were not completely covered because of the cancellation of the Russian survey. Therefore, Polish and Lithuanian data from part of these rectangles were used. In addition, during the acoustic survey in October 2009, in all 5 rectangles were investigated by more than one vessel (Figure 3.1). The figure illustrates that the planned coverage of the Baltic Sea during the acoustic survey in October was almost totally realized; only the rectangles of Russian zone were not covered because of survey cancellation.

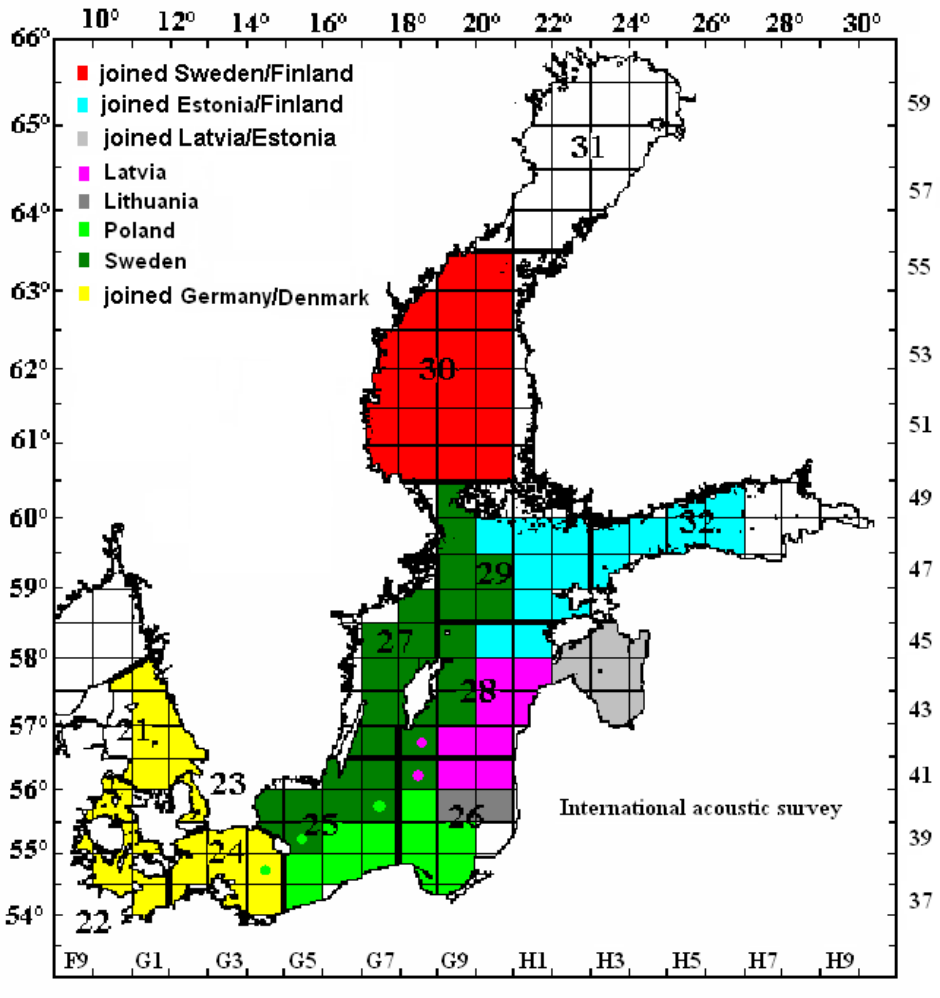


Figure 3.1. Map of surveys conducted in October 2009. Colors indicate the countries, which covered specific ICES-rectangles and delivered data to BAD1-database, thus was responsible for this rectangle. Colored dots within a rectangle explain additional data in BAD1 partly or totally covered by other countries.

3.1.2 Total results

The abundance estimates which are based on the international acoustic survey in October 2009 are presented per rectangle and age group in Tables 3.1.1 and 3.1.2 for herring and sprat, respectively. In addition, the abundance estimates for herring and sprat are presented in Tables 3.1.3 and 3.1.4 per subdivision and age group.

3.1.3 Area corrected data

During WGBIFS meeting 2006 possible improvement of presenting the results from acoustic surveys was discussed, and correction factor for each 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 the subdivision that are presented in the BIAS manual (see Table 2.2 in BIAS manual) and the area of rectangles which was covered during the survey. Some disagreements appeared about the appropriate area of SD28. 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 subdivision are summarized in Tables 3.1.5 and 3.1.6 respectively. Biomass for herring and sprat per subdivision were given in Tables 3.1.7 and 3.1.8

3.1.4 Tuning fleets for WGBFAS

3.1.4.1 Sprat in subdivisions 24–29

Tuning fleet is presented from the October acoustic survey for the sprat assessment of the Stock in Central Baltic, the area corrected combined results of Subdivisions 24–29, 1991–2009 are presented in Annex 5: Table 3 and recruitment index for sprat (age 0) in Subdivisions 26 + 28 is presented in Annex 5: Table 4. Older data than for 1991 does not exist in the current BAD1 database. In the years 1993, 1997 and 1995 the 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.

3.1.4.2 Herring in Subdivisions 25–29

Tuning fleet is presented from the October acoustic survey for the herring assessment of the Stock in Central Baltic, the area corrected combined results of Subdivisions 25–29, 1991–2009 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, 1997 and 1995 the 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. In 2000 a large discrepancy between old and new dataset is observed. WGBIFS cannot explain remarkable differences between new BIAS herring abundance indices in year 2000 compared the ones used by WGBFAS before 2009, because the indices were calculated by WGBFAS in 2001. It is probably handling a calculation mistake made during the combination of acoustic data provided by WGBIFS.

3.1.5 Recommendation to WGBFAS

WGBIFS recommends that the new dataset can be used in the assessment of the herring stocks in the Baltic Sea with the restriction that the following years are excluded from the index series: 1993, 1995 and 1997.

WGBIFS recommends that the new dataset can be used in the assessment of the sprat stock in the Baltic Sea with the restriction that the following years are excluded from the index series: 1993, 1995 and 1997.

Table 3.1.1. Estimated numbers (millions) of herring October 2009 by rectangle.

SD	RECT	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	41G0	70,2	68,6	1,6							
21	41G1	292,9	272,0	20,8			0,2				
21	41G2	69,5	67,8	1,7							
21	42G1	65,3	54,4	10,6		0,3	0,1				
21	42G2	65,3	61,4	3,9							
22	37G0	16,6	16,4	0,2							
22	37G1	497,3	479,5	12,1	2,1	1,1	2,5				
22	38G0	169,9	166,3	3,4		0,1	0,1				
22	38G1	22,8	22,3	0,4	0,1		0,1				
22	39F9	12,8	12,8								
22	39G0	27,4	27,3	0,1							
22	39G1	1,4		1,4							
22	40F9	0,1	0,1								
22	40G0	1,6	1,6								

SD	RECT	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
22	40G1	0,2	0,2								
22	41G0	0,1	0,1								
23	39G2	364,5	337,8	12,7	4,2	3,3	2,8	1,4	1,4	0,9	
23	40G2	99,4	31,1	39,3	16,6	7,6	2,7	1,1	0,4	0,2	0,2
23	41G2	23,9	21,4	2,1	0,2	0,1					
24	37G2	194,3	186,7	4,6	0,9	1,0	0,7	0,2	0,2	0,1	
24	37G3	84,0	49,2	8,5	8,5	6,7	4,3	2,9	2,3	1,2	0,5
24	37G4	531,4	191,1	100,0	83,2	57,6	38,7	25,1	22,1	11,1	2,6
24	38G2	422,7	393,3	14,1	5,3	4,7	2,3	0,8	1,7	0,3	0,1
24	38G3	101,9	67,8	12,4	7,7	5,3	3,8	1,7	2,1	0,8	0,2
24	38G4	362,0	130,2	68,1	56,7	39,3	26,4	17,1	15,0	7,6	1,8
24	39G2	271,2	251,3	9,4	3,1	2,4	2,1	1,1	1,0	0,6	
24	39G3	167,1	98,3	28,5	13,9	10,2	6,7	3,1	4,3	2,1	0,1
24	39G4	144,3	52,5	23,4	23,8	16,9	10,5	5,6	7,3	3,1	1,3
25	37G5	96,3	20,2	5,9	16,6	20,5	17,9	3,3	6,3	4,6	1,1
25	38G5	337,3	46,7	18,1	57,2	74,7	64,2	17,9	29,1	24,5	4,9
25	38G6	335,2	31,2	16,1	66,2	80,6	64,3	17,4	26,8	27,1	5,6
25	38G7	100,8	21,8	5,7	18,0	21,5	18,5	3,0	6,2	4,6	1,4
25	39G4	53,8	32,2	2,5	4,1	4,9	5,0	2,3	0,9	1,9	0,2
25	39G5	189,1	55,9	10,2	23,8	33,0	50,4	5,8	7,5		2,7
25	39G6	418,2	30,1	25,0	88,2	103,2	85,1	19,5	32,0	29,1	6,1
25	39G7	173,5	75,6	6,2	22,2	25,3	21,4	5,6	8,2	7,5	1,5
25	40G4	199,9	10,3	3,1	18,5	38,2	24,5	13,5	63,0	22,0	6,9
25	40G5	304,9	13,1	1,2	13,9	28,2	60,2	42,4	68,4	66,7	11,0
25	40G6	444,8	32,6	57,4	109,0	82,5	70,5	26,6	32,5	33,1	0,5
25	40G7	190,4	0,6	3,4	34,2	61,0	19,6	12,8	40,7	9,5	8,8
25	41G6	367,1	1,3	13,4	98,7	49,3	78,0	26,6	45,4	45,0	9,3
25	41G7	635,9	0,8	31,1	162,6	211,0	79,7	35,1	65,4	42,8	7,3
26	37G8	3,7	3,2	0,1	0,2	0,1	0,1			0,1	
26	37G9	51,4	27,5	2,2	6,7	4,6	4,2	1,7	1,5	2,1	0,8
26	38G8	106,5	37,0	3,2	16,3	11,5	13,5	5,1	6,3	9,4	4,1
26	38G9	205,3	21,1	13,4	51,1	35,8	32,4	13,3	14,1	17,8	6,4
26	39G8	527,8	92,7	41,0	118,7	86,6	80,7	32,2	25,8	37,8	12,4
26	39G9	242,6	5,5	13,6	58,3	39,7	44,4	16,8	22,1	29,9	12,3
26	39H0	602,5	291,2	20,2	72,2	44,5	60,6	33,9	35,1	25,1	19,6
26	40G8	122,6	8,4	11,2	32,3	22,2	21,2	8,1	6,4	9,4	3,6
26	40G9	226,5	31,0	22,0	56,4	59,8	24,5	14,0	13,9	2,4	2,4
26	40H0	613,6	381,3	38,6	67,4	67,8	27,2	16,2	6,9	4,2	4,1
26	41G8	1013,1		4,5	86,8	109,8	177,8	68,2	317,7	161,7	86,6
26	41G9	271,1		10,8	74,7	40,6	36,1	27,0	30,9	28,6	22,4
26	41H0	587,4		23,5	161,9	88,0	78,2	58,5	67,1	61,9	48,4
27	42G6	137,2		0,8	22,1	16,3	31,5	13,7	19,2	26,8	7,0
27	42G7	838,0	0,4	98,9	220,2	159,5	140,4	56,6	117,2	40,9	4,1
27	43G7	1484,6	3,1	144,9	526,8	324,3	222,4	105,8	108,4	39,1	9,8
27	44G7	1956,5		199,9	829,5	310,2	305,9	77,9	131,7	94,6	6,9
27	44G8	389,3		14,0	210,5	93,2	59,1	2,9	7,1	2,6	

SD	RECT	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
27	45G7	703,8	2,9	33,6	361,2	121,4	97,8	0,7	71,6	14,4	
27	45G8	410,6		43,9	238,4	82,4	27,7	12,8	2,1	1,0	2,3
27	46G8	834,0	18,0	128,3	359,1	77,5	158,4	25,0	21,6	46,0	
28A	42G8	344,1	1,1	6,7	99,9	65,2	62,9	37,7	49,6	17,2	3,8
28A	42G9	142,0		5,6	38,1	25,3	24,2	11,2	13,8	13,7	10,1
28A	42H0	376,5	0,7	17,7	73,1	86,5	80,8	43,7	35,6	27,0	11,5
28A	43G8	577,0		4,0	264,7	140,0	92,4	44,6	15,6	15,6	
28A	43G9	969,1	1,4	56,0	331,0	169,6	299,2	38,0	59,9	9,6	4,3
28A	43H0	760,8	4,9	28,2	195,4	99,6	139,6	40,2	76,8	127,9	48,2
28A	43H1	550,9	1,4	28,3	168,4	116,3	115,2	52,5	16,0	26,8	26,1
28A	44G9	2770,0			369,6	640,7	311,9	399,2	559,9	431,3	57,4
28A	44H0	481,5	3,2	19,4	85,4	96,0	117,1	50,4	44,2	54,4	11,3
28A	44H1	558,5	1,1	55,2	204,3	116,6	104,7	37,4	12,4	14,7	12,2
28A	45G9	475,3	4,1	11,8	140,5	155,1	112,1	6,5	37,0	8,3	
28A	45H0	1440,0	31,7	76,7	508,0	447,7	240,0	37,7	17,0	53,9	27,3
28A	45H1	534,1	11,8	28,5	188,4	166,0	89,0	14,0	6,3	20,0	10,1
29	46G9	559,6	1,3	102,7	304,6	85,3	25,3	17,5	16,3	5,8	0,9
29	46H0	510,3	2,4	81,5	244,4	61,7	81,8	0,8	19,5	18,4	
29	46H1	244,2	1,0	67,7	126,8	15,1	18,7	2,8	1,7	7,8	2,6
29	46H2	47,5	0,2	13,8	24,4	2,8	3,5	0,5	0,3	1,5	0,5
29	47G9	1145,3		82,4	279,3	255,6	180,2	155,7	150,9	37,7	3,5
29	47H0	417,6	9,0	37,4	148,9	47,9	139,1	7,1	22,3	5,9	
29	47H1	939,6	48,3	336,8	421,8	38,9	52,1	8,9	3,9	20,5	8,4
29	47H2	152,1	25,3	40,3	67,1	6,2	7,6	0,6	0,8	3,6	0,6
29	48G9	4873,6	222,3	2154,4	1232,3	743,8	316,1	50,8	122,8	17,8	13,4
29	48H0	2712,0	1042,6	892,4	605,2	48,4	70,6	11,5	4,9	25,8	10,6
29	48H1	1483,8	59,8	658,1	596,3	46,7	70,6	12,1	4,2	24,5	11,6
29	48H2	696,5	492,4	102,1	74,6	7,5	10,6	2,6	0,8	3,6	2,4
29	49G9	643,8		82,1	168,3	110,2	146,4	50,5	58,9	27,4	
30	50G7	1129,0	453,0	602,6	37,4	24,5	9,1			2,4	
30	50G8	1003,3	88,6	482,5	141,5	161,6	43,6	5,2	14,2	42,9	23,2
30	50G9	758,5	1,6	122,1	134,4	116,3	98,8	32,3	7,8	137,1	108,1
30	50H0	2030,9	10,2	499,3	800,1	313,1	61,4	6,1	81,8	164,7	94,2
30	51G7	1332,1	4,4	258,5	171,2	351,1	138,9	17,5	65,5	181,7	143,3
30	51G8	1508,8	9,1	373,2	176,2	294,0	150,1	53,9	118,1	243,2	91,1
30	51G9	913,1		18,6	99,2	173,0	161,2	117,8	41,2	216,4	85,7
30	51H0	1001,2	3,4	45,8	111,1	119,5	59,3	174,8	84,4	183,7	219,3
30	52G7	907,9		78,9	196,4	347,0	118,4	7,6	18,2	82,7	58,6
30	52G8	1918,0	3,1	176,0	512,7	477,8	40,4	172,9	209,9	169,8	155,4
30	52G9	1089,9	5,5	59,8	229,9	317,3	134,9	61,0	75,6	138,5	67,4
30	52H0	1192,1	7,6	78,2	173,9	199,9	148,2		169,3	195,8	219,2
30	53G7	839,3		9,5	188,2	263,1	190,0	69,0	4,5	90,3	24,8
30	53G8	1230,4	4,8	134,2	304,1	252,9	52,4	14,3	74,7	130,4	262,5
30	53G9	1405,8		24,8	223,5	249,9	85,3	193,5	51,8	172,0	405,0
30	53H0	1267,7	5,3	198,8	279,4	410,1	109,6		5,7	131,1	127,6
30	54G8	846,1		7,5	43,2	81,3	102,9	95,4	93,4	161,7	260,6

SD	RECT	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
30	54G9	1452,5		31,2	97,8	177,0	182,2	131,7	78,2	308,6	445,9
30	54H0	1706,0	9,7	30,0	412,2	412,1	204,9	7,6	135,7	332,7	161,1
30	55G9	1179,7		13,4	53,1	186,4	56,5	36,0	63,9	273,4	496,9
30	55H0	1337,9	37,0	138,2	433,4	334,9	160,3	18,1	43,7	64,5	107,7
32	47H3	880,5		179,5	403,5	73,3	123,3	25,5	9,4	62,8	3,2
32	48H3	904,3	37,1	310,5	350,1	52,9	82,1	18,5	5,0	44,2	3,9
32	48H4	1112,4	13,6	278,5	489,6	81,7	137,3	28,6	9,6	70,3	3,2
32	48H5	1229,4	2,2	329,6	537,8	89,1	149,3	30,9	10,5	76,7	3,2
32	48H6	1227,0		265,6	556,9	99,1	168,2	34,3	13,4	85,9	3,6
32	49H5	909,2	1,6	237,0	400,1	67,2	112,3	23,1	7,8	57,6	2,5
32	49H6	1089,4	2,0	295,7	475,4	78,3	131,3	27,1	9,2	67,5	2,8

Table 3.1.2. Estimated numbers (millions) of sprat October 2009 by rectangle.

SD	RECT	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	41G0	2,3	1,2	0,6	0,3	0,1	0,0	0,0	0,0	0,0	
21	41G1	35,2	0,3	21,2	7,9	5,4	0,4	0,0	0,0	0,0	
21	41G2	27,6	12,6	8,1	3,6	3,0	0,3	0,1	0,0	0,0	
21	42G1			0,0	0,0	0,0	0,0	0,0	0,0	0,0	
21	42G2	20,4	18,5	1,9	0,0	0,0	0,0	0,0	0,0	0,0	
22	37G0	23,2	20,3	1,3	0,4	0,5	0,3	0,5	0,0	0,0	
22	37G1	39,2	33,4	2,5	1,5	1,0	0,2	0,6	0,0	0,0	
22	38G0	353,7	347,6	2,0	0,7	1,4	0,7	1,3	0,0	0,0	
22	38G1	7,9	6,8	0,5	0,2	0,2	0,1	0,2	0,0	0,0	
22	39F9	218,6	218,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
22	39G0	74,7	74,6	0,1	0,1	0,1	0,0	0,0	0,0	0,0	
22	39G1	8,5	8,5	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
22	40F9	13,9	13,9	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
22	40G0	478,6	478,6	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
22	40G1	53,0	53,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
22	41G0	25,1	25,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
23	39G2	19,1	16,4	1,3	0,7	0,6	0,0	0,0	0,0	0,0	
23	40G2	190,5	2,0	29,0	43,9	80,2	21,7	11,5	1,9	0,3	
23	41G2	44,9	2,5	9,0	10,6	16,8	3,4	2,1	0,4	0,0	
24	37G2	9,9	3,0	3,7	1,5	1,5	0,1	0,1	0,0	0,0	
24	37G3	616,3	598,9	12,7	1,8	2,7	0,2	0,0	0,0	0,0	
24	37G4	547,8	142,3	172,0	116,8	100,3	6,8	8,1	0,7	0,1	0,7
24	38G2	267,3	244,9	20,4	1,0	0,8					
24	38G3	1980,0	1864,2	92,4	11,7	10,1	0,7	0,7	0,1		0,1
24	38G4	373,3	96,9	117,2	79,6	68,3	4,6	5,5	0,5	0,1	0,5
24	39G2	14,2	12,2	0,9	0,5	0,5					
24	39G3	262,1	75,6	105,7	40,5	34,3	2,5	2,9	0,3	0,1	0,3
24	39G4	372,3	3,1	129,3	118,7	97,6	8,3	12,1	1,3	0,5	1,3
25	37G5	250,9	12,4	79,0	54,3	58,5	25,5	12,7	8,6		
25	38G5	675,7	17,4	214,4	158,8	160,4	70,7	31,2	22,7		

SD	RECT	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
25	38G6	414,2	16,4	164,3	82,5	85,9	36,1	17,9	8,3	2,9	
25	38G7	268,9	0,2	92,3	64,2	64,4	30,1	10,4	7,4		
25	39G4	162,4	0,6	54,6	20,1	69,9	6,4	0,6	5,2		5,1
25	39G5	805,3	7,3	370,0	58,5	186,7	96,3	55,9	30,6		
25	39G6	748,2	3,2	385,4	143,7	128,5	53,7	20,7	11,0	2,2	
25	39G7	1211,3	153,6	603,1	190,2	159,9	65,3	23,5	13,0	2,7	
25	40G4	125,6	17,2	44,9	7,1	39,5	8,2	4,1	4,6	0,2	
25	40G5	242,7	2,5	49,5	18,6	81,3	34,3	20,9	28,2	7,3	
25	40G6	553,9	8,7	251,7	28,2	123,2	114,2	1,0	18,9	8,0	
25	40G7	1262,9		929,5	73,3	174,0	41,8	22,8	21,5		
25	41G6	414,3		163,7	34,4	120,8	14,8	27,7	38,6	13,1	1,2
25	41G7	276,5	2,1	139,0	41,3	39,7	10,1	10,3	16,9	17,0	
26	37G8	348,1	89,3	240,4	11,9	4,8	1,2	0,4	0,1		
26	37G9	1296,6	549,5	721,3	20,0	4,2	1,2		0,4		
26	38G8	1501,7	192,3	1075,2	129,9	68,5	20,1	11,0	4,7		
26	38G9	1140,4	403,5	679,9	38,3	13,4	4,6	0,5	0,2		
26	39G8	915,4	24,5	619,8	138,5	85,2	26,2	12,0	9,3		
26	39G9	701,5	184,3	472,8	29,2	11,3	3,6		0,2		
26	39H0	2149,1	234,0	1462,6	206,7	159,9	40,2	3,0	37,8	4,8	
26	40G8	1245,2	14,9	903,1	172,4	102,5	30,9	14,5	6,9		
26	40G9	4810,0	1113,7	1408,1	1803,8	226,8	147,6	27,0	72,0	11,1	
26	40H0	1236,1	383,2	601,7	134,1	40,5	46,3	13,7	15,1	0,8	0,8
26	41G8	638,2		324,5		112,0	87,3	8,6	82,2	10,3	13,4
26	41G9	97,8		19,0	12,9	27,7	16,8	9,5	8,4	1,0	2,5
26	41H0	3687,5	2176,6	1093,7	149,9	151,1	54,0		44,4	18,0	
27	42G6	54,5		28,1	7,5	9,0	2,8	2,6	1,4	1,3	1,9
27	42G7	1357,7	4,6	701,6	87,6	325,1	87,1	28,2	39,5	82,4	1,5
27	43G7	2055,0		1189,4	320,8	98,2	151,1	58,0	125,8	93,2	18,6
27	44G7	388,5	0,6	122,8	18,7	98,3	49,8	15,8	47,7	31,6	3,1
27	44G8	615,5	1,3	372,3	35,0	120,8	14,7	7,2	54,8	2,2	7,2
27	45G7	679,1	2,8	282,6	66,5	154,4	11,0	51,4	78,4	15,6	16,5
27	45G8	1201,9	9,4	364,6	235,2	278,3	138,7	69,1	86,8	15,2	4,7
27	46G8	1296,0	4,9	427,1	170,9	403,8	158,2	35,0	90,3	5,8	
28A	42G8	2035,1		1023,9	82,1	476,2	89,9	35,4	210,9	116,7	
28A	42G9	1561,1	20,1	1079,1	277,1	60,4	51,3	3,3	55,2	0,4	14,3
28A	42H0	3245,0	816,5	1299,2	401,1	478,6	140,8	16,2	61,8	22,9	8,1
28A	43G8	483,9		175,6	67,2	99,8	72,5	3,7	31,6	33,6	
28A	43G9	412,2		147,1	108,8	58,9	23,3	16,2	55,4	2,5	
28A	43H0	4738,6	11,1	1711,9	440,2	1103,9	621,1	181,4	379,0	119,4	170,6
28A	43H1	1456,5		353,6	362,1	350,2	161,3	29,0	99,7	43,7	57,0
28A	44G9	229,1	0,8	106,2	28,1	56,6	10,0	0,8	26,6		
28A	44H0	3004,2	0,4	1036,0	269,4	688,3	420,5	121,8	250,6	92,6	124,7
28A	44H1	6152,9		1669,2	1379,7	1074,7	555,7	363,1	711,4	249,8	149,4
28A	45G9	1302,2		352,6	218,3	446,3	131,1	6,6	98,9	48,4	
28A	45H0	10962,0	108,5	3820,4	2724,2	2426,6	554,4	458,6	684,7	184,5	
28A	45H1	4065,7	40,3	1417,0	1010,4	900,0	205,6	170,1	253,9	68,4	

SD	RECT	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
29	46G9	2846,7	53,4	1716,4	204,4	322,7	77,7	140,2	100,7	211,7	19,5
29	46H0	511,7	82,4	259,9	96,8	28,5	0,8	14,4	26,1	1,4	1,4
29	46H1	8564,8	61,4	5069,3	1678,8	874,5	161,0	282,8	334,9	26,9	75,1
29	46H2	1390,4	14,2	935,4	249,1	97,3	16,9	33,7	34,8	2,9	6,0
29	47G9	257,8		135,7	26,5	48,2	26,5		10,6		10,4
29	47H0	1270,2	41,6	839,0	63,1	187,7	21,4	29,0	29,0	33,0	26,4
29	47H1	6980,2	152,3	3186,3	1477,1	1062,5	210,8	327,4	418,2	33,0	112,6
29	47H2	18551,8	215,7	13422,1	2812,0	1048,1	207,2	355,4	381,1	41,9	68,5
29	48G9	2719,5	252,7	1615,9	148,1	388,0	33,3	80,0	95,8	89,0	16,7
29	48H0	1446,5	300,4	477,5	197,2	208,8	43,8	75,5	91,6	12,2	39,4
29	48H1	8743,7	198,3	4570,4	1628,8	1092,0	247,9	386,0	449,2	49,5	121,5
29	48H2	18550,0	274,7	10651,1	3336,2	2050,8	445,6	679,0	802,7	83,6	226,2
29	49G9	3,0		0,7			0,5		1,2	0,3	0,3
30	50G7	0,3		0,3							
30	50G8	17,3	0,2	2,3		2,2			7,2	4,8	0,7
30	50G9	24,5	6,2	1,6	3,1	2,9	1,7	0,5	3,2	2,3	3,1
30	50H0	108,1	0,7	9,9	4,0	11,8	2,9	10,9	37,9	18,3	11,5
30	51G7	2,2			0,8				1,5		
30	51G8	506,2		55,4	36,9	12,2		12,3	144,9	147,4	97,1
30	51G9	76,1		15,5	7,0	3,5	2,4	3,5	14,9	26,9	2,6
30	51H0	106,9		9,8	8,6	17,4	7,3		23,7	31,5	8,7
30	52G7										
30	52G8	32,1		11,4	1,8	4,3	1,7		0,5	8,3	4,2
30	52G9	360,3		47,1	12,8	6,5	21,4		45,2	140,6	86,8
30	52H0	61,5		9,7	3,2	3,0	4,6		15,0	18,6	7,5
30	53G7										
30	53G8	756,1		248,7	43,5	28,1	40,6		118,1	263,9	13,4
30	53G9	0,4				0,4					
30	53H0	1,5							0,5	0,3	0,8
30	54G8										
30	54G9	19,1		0,8	0,8	0,8			5,3	6,6	4,8
30	54H0	124,8		8,3	0,9	16,3	20,1		20,6	44,7	13,9
30	55G9	0,6					0,6				
30	55H0	44,7		1,3		6,1	3,1		13,3	14,3	6,6
32	47H3	6605,2	19,5	4247,4	1123,4	638,4	118,2	143,1	190,8	101,6	22,8
32	48H3	17526,5	69,5	5840,0	4118,9	3851,4	812,6	994,5	1265,1	359,6	214,9
32	48H4	16552,3	164,7	9303,1	3183,1	2004,6	348,1	459,5	705,4	297,5	86,4
32	48H5	10279,1	281,2	4969,5	2121,9	1571,7	256,3	363,8	496,2	166,0	52,7
32	48H6	2459,5	21,5	1306,2	510,5	327,8	51,4	76,1	111,1	44,4	10,4
32	49H5	6917,2	205,9	3304,1	1428,1	1071,7	175,6	248,2	336,6	110,6	36,2
32	49H6	9523,7	258,4	4609,2	1965,8	1454,7	237,1	336,6	459,3	153,8	48,7

Table 3.1.3. Estimated numbers (millions) of herring by Subdivision, October 2009.

SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	563	524	39	0	0	0	0	0	0	0
22	750	726	18	2	1	3	0	0	0	0
23	488	390	54	21	11	6	3	2	1	0
24	2 279	1 420	269	203	144	95	57	56	27	7
25	3 847	372	199	733	834	659	232	432	318	67
26	4 574	899	204	803	611	601	295	548	390	223
27	6 754	24	664	2 768	1 185	1 043	295	479	265	30
28	9 980	61	338	2 667	2 325	1 789	813	944	821	222
29	14 426	1 905	4 652	4 294	1 470	1 123	321	407	200	55
30	26 050	643	3 383	4 819	5 263	2 308	1 215	1 438	3 424	3 558
32	7 352	57	1 896	3 213	542	904	188	65	465	22

Table 3.1.4. Estimated numbers (millions) of sprat by Subdivision, October 2009.

SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	85	33	32	12	9	1	0	0	0	0
22	1 297	1 280	6	3	3	1	3	0	0	0
23	255	21	39	55	98	25	14	2	0	0
24	4 443	3 041	654	372	316	23	29	3	1	3
25	7 413	241	3 541	975	1 493	607	260	236	53	6
26	19 768	5 366	9 622	2 847	1 008	480	100	282	46	17
27	7 648	24	3 489	942	1 488	613	267	525	247	53
28	39 649	998	14 192	7 369	8 220	3 038	1 406	2 920	983	524
29	71 836	1 647	42 880	11 918	7 409	1 493	2 404	2 776	585	724
30	2 243	7	422	123	115	106	27	452	728	262
32	69 864	1 021	33 580	14 452	10 920	1 999	2 622	3 565	1 234	472

Table 3.1.5. Area corrected numbers (millions) of herring by Subdivision, October 2009.

SD	CORR_FACTOR	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	1,270633	716	666	49	0	0	0	0	0	0	0
22	1,020621	766	741	18	2	1	3	0	0	0	0
23	1,000000	488	390	54	21	11	6	3	2	1	0
24	1,000000	2 279	1 420	269	203	144	95	57	56	27	7
25	1,031989	3 970	384	206	757	861	680	239	446	328	69
26	1,011536	4 627	909	207	812	618	608	298	554	395	226
27	1,230738	8 312	30	818	3 406	1 458	1 284	363	589	326	37
28	1,072553	10 704	66	362	2 860	2 493	1 919	872	1 013	880	238
29	1,039740	14 999	1 980	4 836	4 465	1 528	1 167	334	423	208	57
30	1,056183	27 514	679	3 573	5 090	5 559	2 438	1 283	1 518	3 616	3 757
32	1,694780	12 460	96	3 214	5 446	918	1 532	319	110	788	38

Table 3.1.6. Area corrected numbers (millions) of sprat by Subdivision, October 2009.

SD	CORR_FACTOR	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	1,270633	109	41	40	15	11	1	0	0	0	0
22	1,020621	1 323	1 307	6	3	3	1	3	0	0	0
23	1,000000	255	21	39	55	98	25	14	2	0	0
24	1,000000	4 443	3 041	654	372	316	23	29	3	1	3
25	1,031989	7 650	249	3 655	1 006	1 541	627	268	243	55	6
26	1,011536	19 996	5 428	9 733	2 880	1 020	485	101	285	47	17
27	1,230738	9 413	29	4 293	1 159	1 831	755	329	646	304	66
28	1,072553	42 525	1 070	15 221	7 903	8 817	3 258	1 508	3 131	1 054	562
29	1,039740	74 691	1 713	44 584	12 392	7 703	1 553	2 499	2 886	608	753
30	1,056183	2 369	7	446	130	122	112	29	477	769	276
32	1,694780	118 403	1 730	56 910	24 493	18 507	3 388	4 443	6 041	2 091	800

Table 3.1.7. Estimated biomass (in tons) of herring October 2009.

SD	CORR_FACTOR	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
21	1,270633	115049	114329	721		0	0				
22	1,020621	264762	264586	164	5	1	6				
23	1,000000	117658	115562	1711	295	68	15	3	2	1	0
24	1,000000	354954	317841	15547	10584	5240	2647	1501	1196	385	12
25	1,031989	170817	4898	6169	26176	35543	33994	14867	25075	19221	4874
26	1,011536	153227	7739	5741	25988	20548	23303	12026	25555	19505	12821
27	1,230738	216860	134	11222	74396	36901	40169	13834	25118	13117	1970
28	1,072553	322157	587	6570	64509	64064	57231	31671	44822	40061	12641
29	1,039740	245585	7161	61486	86047	33552	26594	9920	13188	6113	1523
30	1,056183	725052	4262	53629	105435	124070	60070	36696	49436	121057	170397
32	1,694780	205635	381	44692	95863	10435	29468	6162	2446	15266	922

Table 3.1.8. Estimated biomass (in tons) of sprat October 2009.

SD	CORR_FACTOR	Total	age 0	age 1	age 2	age 3	age 4	age 5	age 6	age 7	age 8+
21	1,270633	3319	2730	589		0	0				
22	1,020621	81603	81559	38	3	1	1				
23	1,000000	8262	5666	1173	737	613	59	13	1	0	0
24	1,000000	365092	303119	32796	17730	10539	492	375	33	4	4
25	1,031989	98311	1277	38990	14304	23549	10425	4467	4273	906	119
26	1,011536	167117	19475	91806	31047	12247	6427	1432	3741	685	256
27	1,230738	96232	91	33368	12359	21534	9830	4292	10009	3795	955
28	1,072553	417536	3987	129921	77687	96491	36860	16738	37397	12013	6442
29	1,039740	576380	5179	305509	103540	76206	15792	24629	30636	6584	8305
30	1,056183	30245	17	4292	1473	1420	1323	343	6581	10645	4150
32	1,694780	963043	4454	382998	205889	173102	32869	41628	96102	17590	8411

3.2 Combined results of the 2009 Baltic Acoustic Spring Surveys (BASS)

In May–June 2009, only one acoustic survey was conducted:

VESSEL	COUNTRY	ICES SUBDIVISION
Walther Herwig III	Germany	24, 25, parts of 26, 27 and 28

The planned participation from Russia, Latvia and Lithuania was not realized because of missing ship time.

During late spring the sprat is concentrated in the deeper basins for spawning. Herring stays at this time primarily in shallow water areas close to coasts. The portion of herring is in most areas is much smaller than 10%. These numbers should not be used for a real investigation of abundance. Therefore, only the distribution of sprat is examined in farther. The estimated numbers per age group and ICES square are presented in Table 3.2.1. The spatial distribution of the sprat abundance is demonstrated in Figure 3.2.1

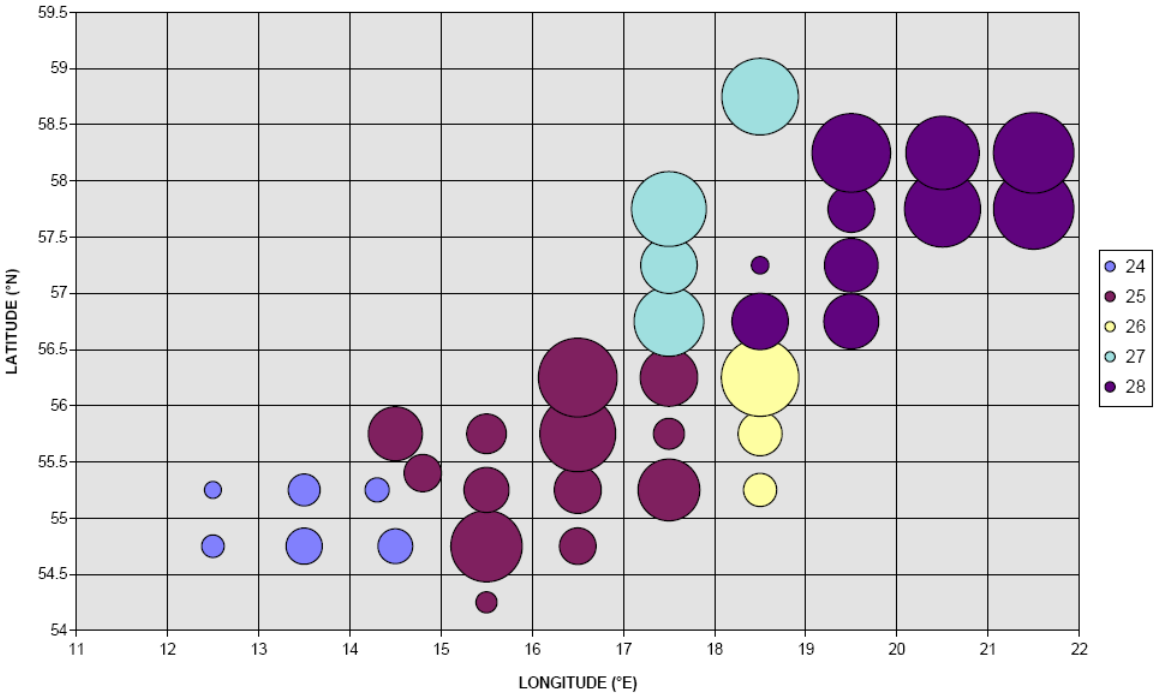


Figure 3.2.1. Covered ICES-Rectangles in 2009 (the area of the circles indicates the number of sprat in the rectangle, the colour indicates the subdivisions).

The cruise report from RV "Walther Herwig III" is presented in the Annex 6.

3.2.1 Area under investigation

Figure 3.2.1 illustrates the coverage of the Baltic Sea during the BASS surveys in 2009.

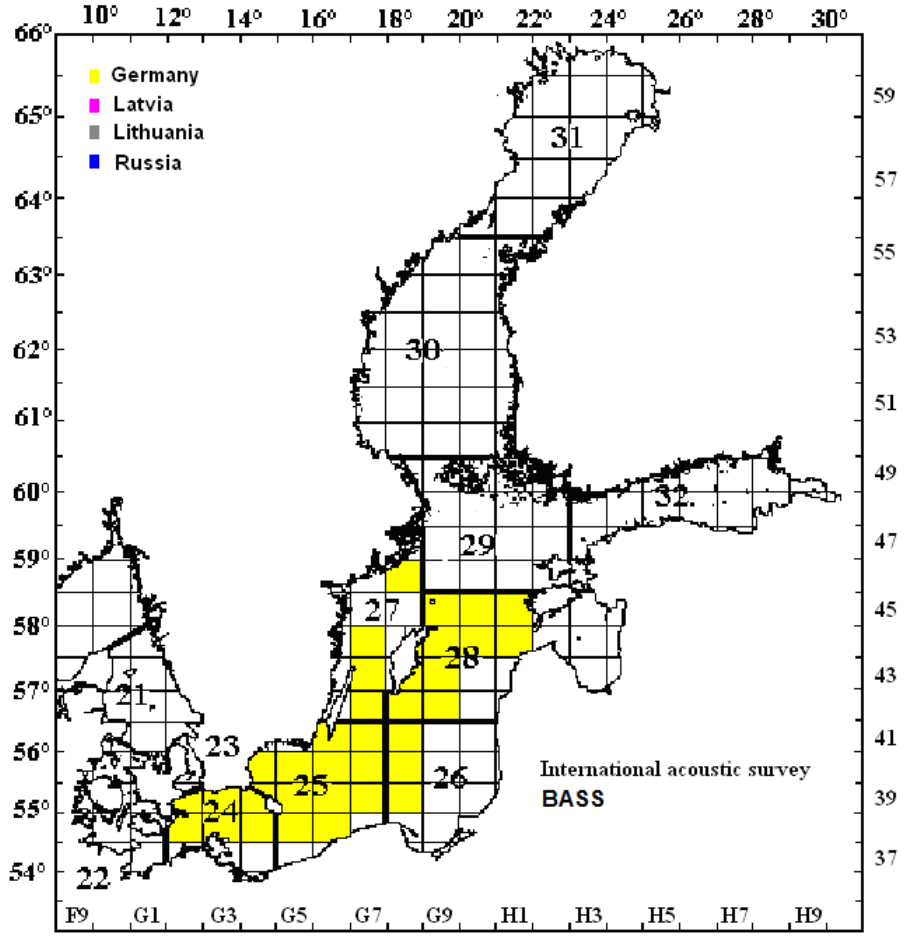


Figure 3.2.2. Map of BASS survey conducted in May/June 2009.

Because of the poor participation the available effort was directed to the essential parts of the distribution area of sprat. For the estimation of spring survey tuning fleet a standard area is used containing the SD 24, 25, 26 and 28 in all the years before. The non-attendance of the scheduled ships has created a big black hole in the southeastern part of the Baltic. Unfortunately it was not possible for the remaining RV "Walther Herwig III" to cover all this regions because of missing permissions for the EEZ of Russia, Latvia and Lithuania.

The planned coverage was achieved in SD 24 and 25. This area is completely comparable with all the years before. In SD 28 we have a minimal loss of two rectangles and it seems to be not difficult to solve this problem by the usual correction factor. The sampling situation is more critical in SD 26. Compared with the usual coverage of 10 ICES squares we have only the results from three of these areas.

SD	PLANNED COVERAGE	REALIZED COVERAGE	CORRECTION FACTOR 2009
24	4	4	1.28
25	12	12	1.07
26	10	3	3.56
28	12	10	1.37

The use of the sampled areas in SD 26 as a suitable proxy for the total subdivision can be checked with the mean results in the southeast part of the Baltic. In Figure 3.2.3 is a comparison of this mean values of the abundance per year class over all the last years.

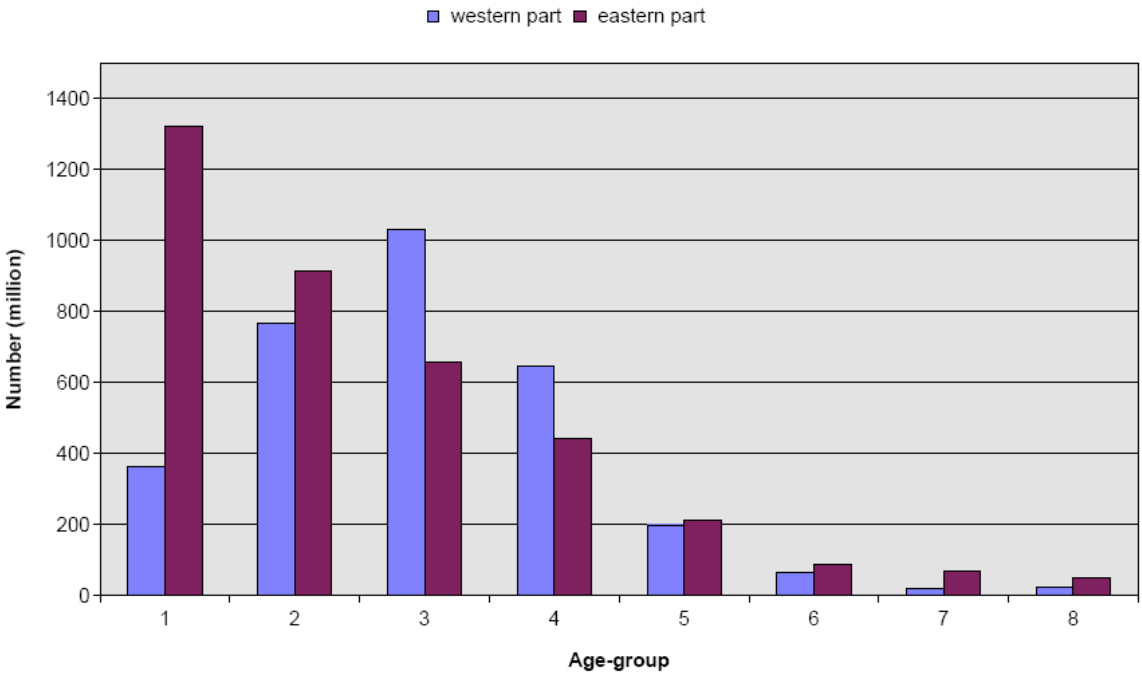


Figure 3.2.3. Comparison of the mean number of sprat in the western and eastern part of Subdivision 26 (BASS 2001 to 2008).

The left bar indicates the western rectangles 39G8 to 41G8 which are only covered in 2009 and the right bar contains all other rectangles in the eastern SD26. In the result we can observe a comparable total abundance in both groups. The younger sprat is underestimated in the western area but this amount is nearly compensated by the 3+ group. This fact can be explained by the concentration of young sprat in eastern coastal waters.

As a first approximation it can be recommended to use the results from the covered rectangles with the common area correction factor to get an estimate of the sprat abundance in SD26. Such appropriate value was used in the tables for spring tuning fleet (see Table 5 in Annex 5).

3.2.2 Combined results and area corrected data

The Baltic sprat stock abundance estimates per ICES Subdivisions and age groups are presented in Table 3.2.2.

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 BIAS manual) and the area of rectangles covered during the survey. The correction factors, calculated by ICES Subdivisions for 2009 are included in Table 3.2.3 and 3.2.4. The area corrected abundance estimates for sprat per ICES Subdivision are summarized in Tables 3.2.3. The corresponding biomass estimates of sprat are given in the Table 3.2.4.

3.2.2.1 The Baltic sprat stock in 2009

In 2009 the total quantity of sprat in Subdivisions 24 to 28 was $186*10^9$. This is 55% more abundance then in the last year. The main part of this increase was delivered by the young sprat. With $61*10^9$ in the age group 1 the recruitment was 6 times higher as in the last year and is comparable to the high year class 2006. The abundance of this age group was $45*10^9$ - the second main contribution to total abundance.

Tuning Fleets for WGBFAS

The complete time-series (2001 to 2009) of the corrected sprat abundance in SD 24, 25, 26 and 28 (without Bay of Riga) is given in Annex 5 Table 5 and in Figure 3.2.4. Only in the last years SD 27 was sufficiently covered and therefore the results from SD 27 data should not be utilized for the index.

The WGBIFS recommends that the tuning fleet from spring survey can be used as an index.

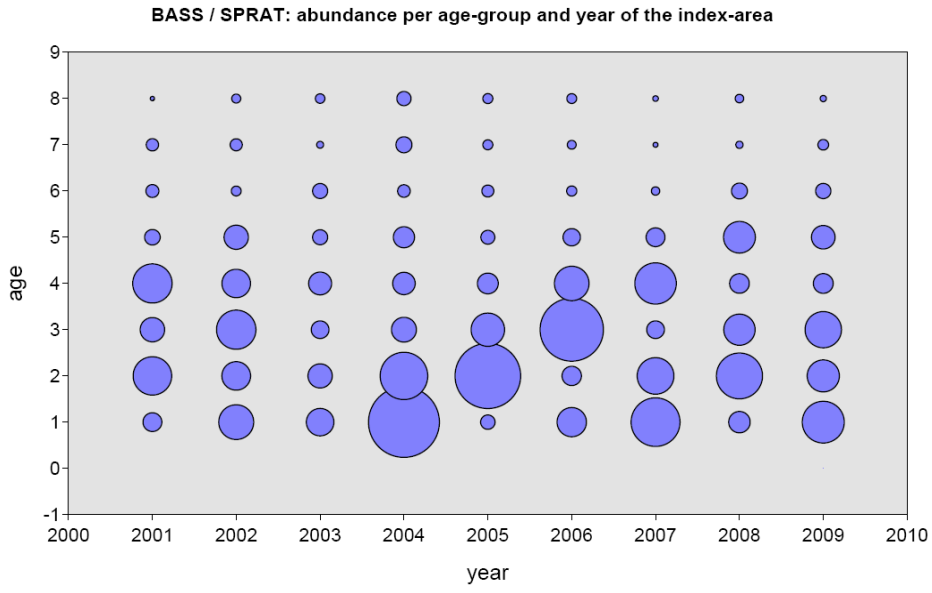


Figure 3.2.4. Spring tuning fleet index for sprat in SD 24, 25, 26 and 28.

Table 3.2.1. Estimated abundance of sprat (millions) per age groups and ICES rectangle; May/July 2009.

SD	RECT	TOTAL	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
24	38G2	540,6	132,0	54,9	198,4	69,0	61,3	23,4	0,8	0,8
24	38G3	1387,2	374,2	129,1	510,1	172,7	144,7	53,2	1,6	1,6
24	38G4	1274,0	400,2	126,4	427,2	158,3	112,3	46,4	1,6	1,6
24	39G2	304,5	74,3	30,9	111,7	38,9	34,5	13,2	0,4	0,5
24	39G3	1071,7	289,1	99,7	394,1	133,5	111,8	41,1	1,2	1,2
24	39G4	618,9	152,6	75,7	231,1	83,4	48,5	25,8	0,9	0,9
25	37G5	471,1	31,6	62,9	184,1	52,9	89,3	17,5	25,3	7,4
25	38G5	5367,0	234,4	1013,2	2135,5	577,3	880,4	179,1	294,1	52,9
25	38G6	1408,3	94,5	188,1	550,4	158,0	267,1	52,3	75,7	22,2
25	39G4	1477,3	192,0	252,4	515,5	147,8	234,8	50,1	63,4	21,3
25	39G5	2134,9	111,0	528,7	852,0	192,6	260,0	66,3	112,5	11,8
25	39G6	2341,8	141,0	534,6	908,8	228,5	320,8	68,8	122,7	16,6
25	39G7	4035,4	159,9	894,8	1726,5	348,9	525,8	126,1	242,9	10,4
25	40G4	3088,4	1134,9	593,4	769,8	177,6	253,9	54,5	89,9	14,4
25	40G5	1666,9	77,1	524,2	646,1	136,2	147,0	50,3	80,7	5,3
25	40G6	6076,1	1108,2	1639,5	1946,1	459,0	529,3	139,5	236,3	18,2
25	40G7	1021,5	141,7	254,1	376,1	74,5	96,8	26,8	50,5	1,0
25	41G6	6536,3	3920,6	1205,3	930,6	192,8	137,4	61,5	84,9	3,2
25	41G7	3475,6	512,4	1357,9	1050,0	246,4	134,2	67,7	104,2	2,8
26	39G8	1162,9	254,3	329,5	338,3	72,6	126,5	4,8	37,0	
26	40G8	2035,2	301,6	610,6	686,2	130,0	235,8	5,7	65,3	
26	41G8	6336,2	1439,0	1211,3	1984,2	534,6	900,3	58,2	208,6	
27	42G7	5125,1	2422,4	1025,7	970,3	311,6	225,7	149,9		19,5
27	43G7	3348,0	1815,9	520,3	567,4	182,8	150,6	97,2		13,8
27	44G7	5896,0	2786,8	1179,9	1116,3	358,4	259,7	172,4		22,5
27	46G8	6172,3	2917,4	1235,2	1168,6	375,2	271,9	180,5		23,5
28	42G8	3353,3	55,7	853,3	915,3	354,4	657,0	392,0	65,8	59,8
28	42G9	3183,5	442,0	731,7	759,2	281,7	519,3	334,8	56,8	58,1
28	43G8	325,9	3,5	75,2	86,6	39,0	70,9	37,8	6,8	6,1
28	43G9	3048,1	300,8	628,1	737,0	334,3	605,7	326,5	58,9	56,7
28	44G9	2295,5	105,5	480,4	590,5	253,1	490,5	277,4	56,8	41,3
28	44H0	6110,6	3054,5	858,3	867,1	310,4	542,8	354,3	45,4	77,7
28	44H1	6810,6	4433,7	510,3	646,0	273,3	538,0	301,9	60,6	46,8
28	45G9	6494,1	1717,4	1249,4	1318,9	520,6	911,6	569,3	87,8	119,1
28	45H0	5675,4	2500,5	797,4	869,9	353,0	644,4	376,0	62,8	71,3
28	45H1	6831,9	4447,6	511,9	648,0	274,1	539,7	302,9	60,8	47,0

Table 3.2.2. Estimated numbers of sprat (million) by Subdivision, May/July 2009.

SD	TOTAL	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
24	5 197	1 423	517	1 873	656	513	203	7	7
25	39 101	7 859	9 049	12 591	2 993	3 877	961	1 583	188
26	9 534	1 995	2 151	3 009	737	1 263	69	311	0
27	20 541	9 942	3 961	3 823	1 228	908	600	0	79
28	44 129	17 061	6 696	7 438	2 994	5 520	3 273	562	584

Table 3.2.3. Area corrected numbers of sprat (million) by Subdivision, May/July 2009.

SD	CORR_FACTOR	TOTAL	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
24	1,278870	6 646	1 819	661	2 395	839	656	260	8	8
25	1,074626	42 019	8 446	9 725	13 531	3 216	4 166	1 032	1 701	202
26	3,563310	33 974	7 108	7 666	10 721	2 627	4 499	245	1 108	0
27	2,077896	42 683	20 659	8 231	7 943	2 552	1 886	1 247	0	165
28	1,367524	60 347	23 332	9 157	10 172	4 094	7 549	4 476	769	799

Table 3.2.4. Corrected sprat biomass (in tonnes) of sprat; May/July 2009.

SD	CORR_FACTOR	TOTAL	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
24	1,278870	91200	12818	9037	38027	13229	12168	5511	205	205
25	1,074626	434331	44588	96645	159479	39429	56565	13905	20672	3048
26	3,563310	313431	31862	71034	108626	30254	48248	11944	11463	
27	2,077896	280369	72308	64309	73194	23513	19618	25595		1832
28	1,367524	455010	90473	78348	93724	40699	76522	59371	8403	7469

4 Update of BAD1

4.1 Change of the structure of the database to "MS Access" format

The aggregated results from the acoustic surveys in the Baltic Sea were hold up to the last year in Excel-files. Because the data cannot be uploaded into FishFrame at present time, the former storage of the data in "Excel" (BAD1) was converted to "Access" format.

The data of the Baltic Acoustic Spring Survey (Mai-June, BASS) are stored now in the **BASS_DB.mdb** and the data of the Baltic International Acoustic Survey (October, (BIAS) in the **BIAS_DB.mdb**.

The structure of the database has slightly changed to simplify the analysis of the data and to store information about the treatment of multiple covered strata.

The table **TB_2_SURV_STAT (former ST-table)** holds the basic acoustic mean values and species compositions used for the estimation of the abundance. The fields "HC" (Proportion of cod) and "FLAG" were additional introduced in this table. The Flag is used to determine which rectangle should be included in the index calculation or

with which weight it should be included, if there are multiple estimations for a rectangle. The field "AREA" was deleted in this table.

The table **TB_3_ICES_RECT** is new introduced in the database. This table include the rectangle properties as base for geographical referenced analyses (geographic position of the rectangle, Area etc).

The further tables of the old BAD1 were taken over in the access-format without changes of field contents. An actualized version of the database is distributed to all participants by means of upload to the ICES SharePoint site for WGBIFS 2010. A description of the database structure is given in following table.

Table 4.1.1. Structure of the databases BASS_DB and BIAS_DB

TABLE	FIELD	DESCRIPTION
TB_1_CRUISE		**DEFINITION OF THE SURVEY**
	CCODE	Survey code
	SHIP	Name of ship
	YEAR	Year of survey
	COUNTRY	responsible Country
TB_2_SURV_STAT		**ADDITIONAL INFORMATION**
	CCODE	Survey code
	SD	ICES subdivision
	RECT	ICES rectangle
	FLAG	Treatment for double coverage (1)
	SA	NASC per ESDU
	SIGMA	acoustic cross section of mean target
	NTOT	Total number of targets
	HH	Proportion of herring
	HS	Proportion of sprat
	HC	Proportion of cod
	Remarks	
TB_3_ICES_RECT		**DEFINITION OF ICES RECTANGLES**
	Sub_Div	ICES Subdivisions with distinction of 28A (part in the Baltic proper) and 28B (Gulf of Riga)
	SD	ICES subdivision
	ICES_Rectangle	ICES rectangle
	Lat_degree	Latitude of the centre of the rectangle (degree)
	Lat_minute	Latitude of the centre of the rectangle (degree)
	Lon_degree	Longitude of the centre of the rectangle (minutes)
	Lon_minute	Longitude of the centre of the rectangle (minutes)
	Lat_dec	Latitude of the centre of the rectangle (decimal)
	Lon_dec	Longitude of the centre of the rectangle (decimal)
	Area	Area (nm^2)
TB_6_N_HER		**ABUNDANCE OF HERRING**
	CCODE	Survey code
	SD	ICES subdivision
	RECT	ICES rectangle
	N	Number (millions)
	AGE	Age group

Table	Field	Description
TB_4_N_SPR		**Abundance of sprat**
	CCODE	Survey code
	SD	ICES subdivision
	RECT	ICES rectangle
	N	Number (millions)
	AGE	Age group
TB_7_W_HER		**Mean weight of herring**
	CCODE	Survey code
	SD	ICES subdivision
	RECT	ICES rectangle
	W	Weight (gram)
	AGE	Age group
TB_5_W_SPR		**Mean weight of sprat**
	CCODE	Survey code
	SD	ICES subdivision
	RECT	ICES rectangle
	W	Weight (gram)
	AGE	Age group

1. Only this estimation was used for the Rectangle; 0.5: this is one of two averaged estimations; 0.333 this is one three averaged estimations; 0: not used (estimation is questionable or obligate estimation exist and was used only). The value of the flag is used to calculate the rectangle-mean for the abundance and mean individual weight at multiple covered rectangles.

4.2 Standard queries of the databases

Some standard queries are part of the database and can deliver summaries and reports from the dataset. These queries are in accordance with requirements from the assessment group and allow comprehensive aggregations of the data in a way that enables the identification of source data and underlying processes for analyses at any time.

The queries are ordered numerically to maintain a clear arrangement. **The queries concerning sprat start with number 001, to herring with 501**. For both species the second and third digit of the number are the same at comparable queries. The descriptions of the queries comprise short explanations and the used selection criterions for the calculation of the tuning fleets. Some further queries are created to illustrate the results with the pivot chart function of Access.

At working with the queries the control of the selection criterions in the queries is a basic condition for comprehensible results.

Essential standardized queries for the report of WGBIFS are:

Query Number	used for:
107_; 607_	Table: Abundance per rectangle;
107b_; 607b_	Table: Abundance (area-corrected) per Sub-division and selected year
108_; 608_	Table: Abundance (area-corrected) per Sub-division;
110_, 610_	Table: Tuning fleets (area corrected numbers of all age groups)
111_; 611_	Table: Tuning fleets (area corrected numbers of 0-group, recruitment index)
137_; 637_	Table: Individual weight per rectangle and year
142_ ; 642_	Table: Biomass (area-corrected) per Sub-division and year

QUERY NUMBER	USED FOR:
203_; 703_	PivotChart: year-class consistence in the index area
207_; 707_	PivotChart: abundance bubbles per covered ICES-Rect in the investigated years

4.3 Update/correction of the he sub-database BIAS_DB

The database BIAS_DB contains the abundance of herring and sprat and the mean weights of this species for all covered strata (ICES rectangles) for the years 1991 – 2009. The source of this dataset is the BAD1_R12 from 2007 updated with the survey-data from 2008 and 2009. The data were checked again and obvious mistakes were corrected.

BIAS 1993 to 2007

The data of RV "Solea" were recalculated with standardized conditions

→slight change < 1% at the sprat-index in the involved years

BIAS 2007

Corrections of the wrong Baltica-data (Poland, Latvia, Estonia and Finland had joint surveys with RV "Baltica", therefore the survey data from different countries for some ICES rectangles came with the same survey code, which leaded to erroneous data aggregation. Because of that, in 2010 in to the new database an additional field for country identification was introduced.)

→distinct Change of the index-fleets at about 20 -30%

BIAS 2008

Corrections at the Darius-data (wrong nomination of a Rectangle)

→slight change in the index-fleets at about 1–4%.

BIAS 2008

There is a transcription mistake in the WGBFAS Report 2009; Table 7.13. The number for age 8+ must be there 1941.91 instead 19.

4.4 Update of the sub-database BASS_DB

In this database are collected the survey results for herring and sprat of surveys in Mai-June of the years 2001 to 2009. Additionally the BASS_DB contains data from previous hydroacoustic spring investigations in 1994, 1995, 1999 and 2000. These investigations were carried out from Russia and Germany in parts of the present index area only. Estimates of abundance for the total stock for the previous years are not possible because the coverage is insufficient.

WGBIFS recommends for index estimation of sprat only to use the abundance of the years 2001 to 2008.

Herring is inadequate covered by the survey. In May herring is located in the shallow water areas near the coast. Consequently the numbers of herring do not reflect the true stock size. Nevertheless these data could be usable for other investigations.

5 FishFrame (Acoustic)

In the report of WGBIFS in 2009 it was stated:

> "FishFrame ver. 4.3 has a maximum size (1 MB) for files to be uploaded. The new version 5.0 of FishFrame (to be released in July 2009) does not have this kind of limit on file sizes but unfortunately no acoustic module has been included in version 5.0 as a result of lack of funds. It is still at present not known when or if the acoustic module is to be included in ver. 5.0."

This situation has not changed since 2009. The Baltic Regional Coordinating Meeting (RCM-Baltic), which will take place in May 2010, will decide on the future solution for the regional database. The update of FishFrame ver. 4.3 acoustics to ver. 5.0 standard awaits the decision from the RCM-Baltic.

6 Plans, decisions and experiments to be conducted in 2010 and 2011 acoustic surveys

6.1 Planned acoustic survey activities

All the Baltic Sea countries intend to take part in acoustic surveys and experiments in 2010. The list of participating research vessels and periods are given in the following table:

Vessel	Country	Area of investigation (ICES Subdivisions)	(Preliminary) period of investigations	Duration (days)
WALTHER HERWIG III	Germany, Russia	24, 25, 26 (part), 28 (part)	10.5.-30.5.	21
DARIUS	Lithuania, Latvia	26 (Lithuanian EEZ), 28.1 Gulf of Riga	5.5.-20.5.	16
BALTICA	Poland	24(N), 25, 26	20.9.-7.10.	18
ARGOS	Sweden, Finland	30	20.9.-1.10.	10
ARGOS	Sweden	25(N), 27, 28 (W), 29 (W)	11.10.-29.10.	15
SOLEA	Germany, Denmark	21, 22, 23, 24	INFO PENDING	
BALTICA	Latvia, Poland	26(N), 28	12.10.-21.10.	10
BALTICA	Estonia, Finland, Poland	28(part), 29 (N), 32(W)	23.10.-3.10.	12
ATLANTNIRO	Russia	26	15.10.-4.11.	20
DARIUS	Lithuania	26 (Lithuanian EEZ)	October	2
CHARTER	Latvia, Estonia	28 (Gulf of Riga)	25.7.-5.8.	12

The preliminary plan for acoustic surveys and experiments in 2011 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)
BALTICA	Latvia/Poland	26 (W), 28	May	12
Walther Herwig III	Germany	24, 25, 26 (part), 27 (part)	1.5.-22.5.	22
DARIUS	Lithuania	26 (Lithuanian EEZ)	May	2
ATLANTNIRO	Russia	26	15.5.-30.5.	15
BALTICA	Poland	24 (part), 25, 26	September-October	18
BALTICA	Latvia, Estonia, Finland, Poland	SD26 (W), 28, 29 (N), 32 (W)	October, November	22
ARGOS	Sweden	25(N), 27, 28 (W), 29 (W)	September-October	20
ARGOS	Sweden, Finland	30	September-October	13
SOLEA	Germany/Denmark	21, 22, 23, 24	October	22
DARIUS	Lithuania	26 (Lithuania EEZ)	October	2
ATLANTNIRO	Russia	26	15.10.-04.11.	20
CHARTER	Latvia, Estonia	28 (Gulf of Riga)	July	10

6.2 An extended acoustic survey in the Gulf of Bothnia

The coverage of SD 30 is recommended to be continued.

6.3 New design of acoustic surveys (proposed in 2005)

During the WGBIFS-Meeting in 2005, the working group discussed and agreed a new surveys design of acoustic surveys (see WGBIFS-report 2005). The basic idea was that each ICES-Rectangle is assigned to one nation. That means that the mandatory nation will carry out about 60 miles of acoustic measurements covering the complete rectangle and at least 2 control hauls. The data of the nation, which is responsible for the rectangle, are used for estimating the stock indices. However, it is allowed for all nations to cover also other areas (rectangles, part of rectangles).

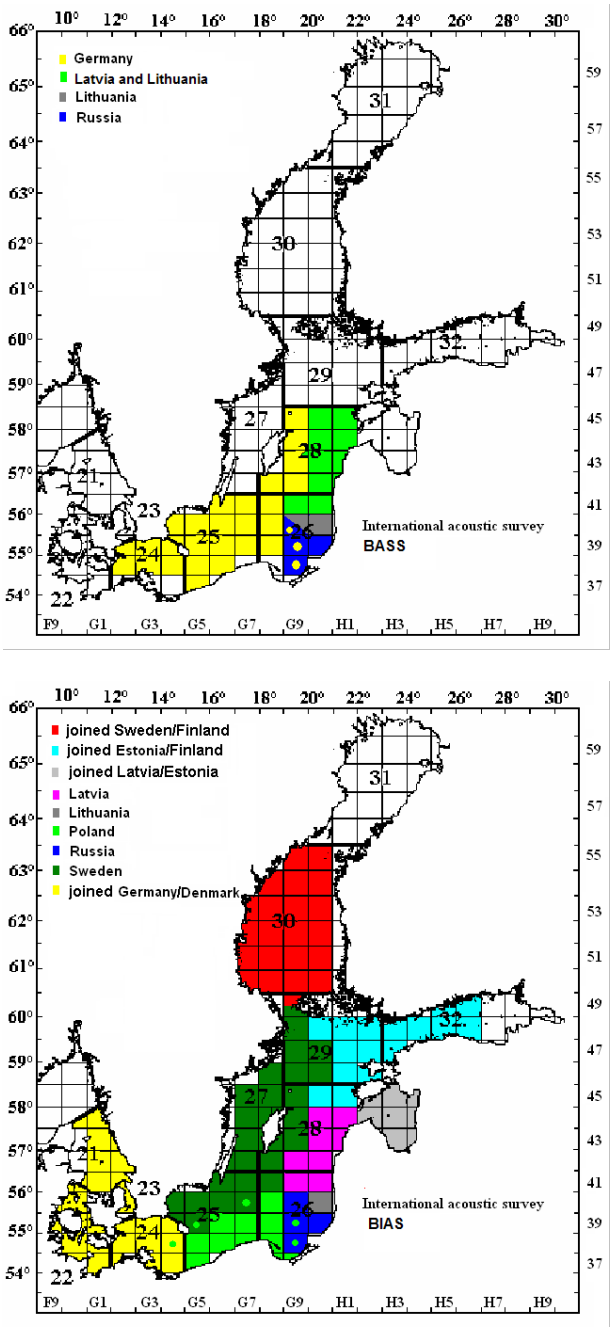
As many countries are performing joint acoustic surveys and the data are presented to the WGBIFS on survey basis, therefore the ICES-Rectangles have been assigned on national- or joint survey basis. This rule is still effective in 2010 and 2011 for all other rectangles but one.

In 2010 May survey, due to problems in permissions for vessels entering other nations' areas and time constraints for new plans, there was no other possibility than to split again the responsibility of the statistical rectangle 40G9 between Russia and Lithuania. Russia and Lithuania were advised to make new applications to each other's authorities to get permission in time for the 2010 BIAS survey in October.

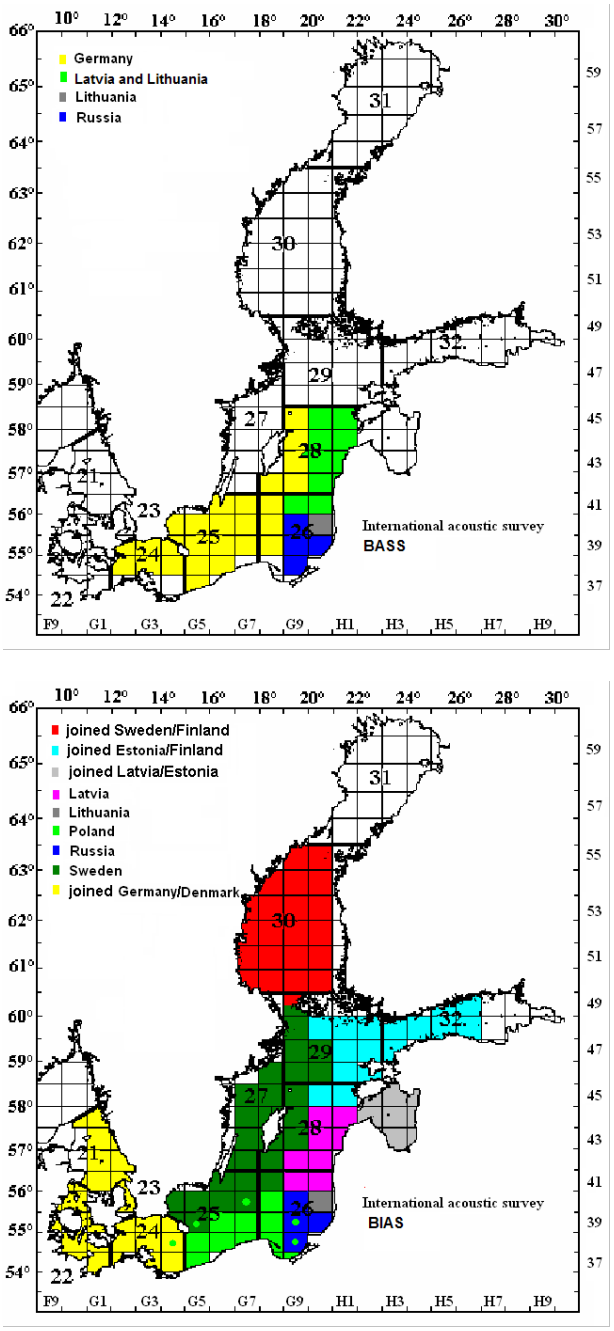
In order to avoid such situations in future, all the countries are advised to make all applications for entering other nation's EEZ in due time and follow closely the progress of these applications. Other countries should also be alerted as early as possible in case if insuperable problems in survey realization, in order to be able make new plans in time. The WGBIFS nominated two persons to coordinate such work if needed: Uwe Böttcher for BASS survey and Niklas Larson for BIAS.

The planned coverage of the Baltic Sea and the assignment of the national/joint acoustic surveys to the rectangles in 2010 are presented in Figures 7.3.1 and 7.3.2. The planned coverage of the Baltic Sea and the assignment of national/joint surveys to the

rectangles during the acoustic surveys in 2011 are presented in Figures 7.3.3 and 7.3.4. The planned assignment of rectangles may be changed.



Figures 7.3.1–7.3.2. The planned coverage of the Baltic Sea and the assignment of the national/joint acoustic surveys to the rectangles during the May and the October surveys in 2010 (from left to right). 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).



Figures 7.3.3–7.3.4. Proposed preliminary partitioning (assignment of the national/joint surveys to rectangles) for the May and the October surveys in 2011 (from left to right). 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)

The main results of both acoustic surveys in May/June and October 2010 should be summarized and reported in standard report format (ICES CM 2008/LRC:08, Addendum 2) and in BAD1 format to the acoustic surveys coordinator **(Niklas Larson, niklas.larson@fiskeriverket.se)** and the BAD1 manager **(Uwe Böttcher, uwe.bottcher@vti.bund.de)** not later than 1 March (one month before the ICES WGBIFS meeting of the next year). These results are intended for the information of the ICES Assessment Working Groups.

7 Evaluating the new results of uncertainty estimates of the BIAS abundance indices applying simulation model

The WGBIFS members tried to discuss this topic but because the persons conducting the study were not able to participate at the 2010 Klaipeda meeting and no new results were presented, no progress could be made. It has been agreed to postpone any further discussion of the topic to the meeting next year where the key persons will be participating.

8 Discuss the descriptions and the documentation of various methods for weighting procedures when combining hauls in compilation of acoustic indices

Methods for weighting the combination of trawl hauls were again briefly discussed at the 2009 meeting in Lysekil. The topic was further discussed in between the acoustical subgroup in the 2010 meeting and the conclusion was that as many methods as possible must be presented and considered before any further decision can be made. During the meeting in 2010 it was agreed by WGBIFS that studies which were presented during the meeting in 2005 and 2006 based on the acoustic surveys in spring (see references) will be repeated in larger scale. Data of both acoustic surveys in October and spring of the period from 2004 to 2006 will be provided by the participating countries until summer 2010 to Rainer Oeberst. It was pointed out by some counties that a clear decision can only be made after discussions in the institute. Therefore, it was agreed that all institutes give the final decisions until end of April to Rainer Oeberst. Dependent on the availability of data the submission of the data will be started in May and will be finalized until September 2010.

Following data are required for the study:

Sa-values of the total water column during the fishing stations (because it is difficult to select the data from the FISHFRAME database without special knowledge it is proposed that these data will provided separately by the countries)

In addition, all information of the fishing stations are required:

- Positions of shooting and hauling
- Used gear type with mesh size in the codend
- Catch in kg und number by species
- Length distribution of all species

The submission of data in the HH, HL and CA format of DATRAS is preferred.

In addition it would be helpful if the data of the survey are available in FISHFRAME database.

The results of the study will be presented during the meeting of WGBIFS in 2011.

Furthermore, it is suggested that additional analyses concerning the used of the results of the fishing stations should be carried out by other countries.

9 Target strength of low important species

The search for adequate information regarding the target strength of non target species proved to be unsuccessful. Only single-scattering properties for the echo frequency sounder 120 kHz were found. A simple transfer of these values to the frequency 38 kHz is not possible. Particularly for fish with low fish length compared to the acoustic wavelength we are outside the geometric scatter range. In this length range the acoustic properties are changing extremely with the frequency.

It is not to be expected that the situation will soon improve. Especially because the non-target species are usually of little economic interest, such fish will not be examined in more detail

In the framework of WGBIFS own acoustic measurements are not feasible. Such studies require a considerable technical and logistical effort so it seems hardly possible to create such possibilities in the Baltic fishery institutes. These problems are of course valid worldwide, a help from other institutions is not to be expected.

The only way out of this situation is the use of proxies. For the concerned fish species morphologic similar objects must be found, where the acoustic parameters are known. Special emphasis must be placed on the format and function of the swimbladder. The swimbladder is the main source of scattering of sound waves in the fish.

If the corresponding approximate values were determined, they should be entered in the manual in Table 5.7.

10 On the coordinated bottom-trawl surveys in 2008 and 2009

10.1 Results from the BITS performed in autumn 2009 and spring 2010

10.1.1 BITS 4th quarter 2009

In total 218 of the planned 231 fishing stations which were planned for the quarter 4 BITS in 2009 were realized with standard TV or rock-hopper TV gear. The difference was caused by the fact that Russia was not able to realize the planned 15 stations within the Russian zone of SD 26 because of technical problems. The total number of realized stations contained six invalid hauls, twenty hauls with validity code N and 7 midwater trawls during the acoustic experiments of the BITS. Unfortunately, it was not possible by other vessels to realize the stations which were located in the Russian zone. The period between the announcement of the technical problems and the start of the BITS was too short to get the permission for the Russian zone. Consequently, estimates of cod and flounder densities were not available for about 30% of the total area of SD 26. Statistical analyses were carried out to estimate the densities of both species based on the estimates of the remaining area (for detailed results see working document "Estimation of cpue values in the Russian zone based on the cpue values of the remaining areas in SD 26", Annex 8). These analyses were also carried out for spring surveys because it was not clear whether the technical problems could be solved by Russia until the BITS in spring 2010. The results of the statistical analyses are summarized in chapter 10.1.2.1.

The density distribution of different length groups of cod were produced for three length groups which were chosen based on the mean cpue values in units of the large TV by length where all hauls were pooled together (Figure 10.1). Smallest cod summarizes cod with a length less than 14 cm. The second group summarizes cod with a

length from 14 cm to 26 cm and the third group incorporates cod from 27 cm to 50 cm. The density distribution of the defined length groups in the total area under investigation are given in Figure 10.2 Using ODV. The surface distributions were produced by VG gridding with an x and y scale-length of 50. In addition, the distribution of temperature is given. The figure clearly shows that it is not possible to realize any analyses based on the available data because data are not available for large parts of the total area. The density distribution illustrates that cod is concentrated in small areas. Furthermore, it can be seen that white area exists in the Russian zone. The smallest cod are concentrated south of Bornholm in SD 24 and SD 25 and close to the island Rügen. Higher densities were also observed in SD 28 close to the east coast. Cod with a length from 14 cm to 26 cm are concentrated in close to the Swedish cost of SD 25 and southeast of Gotland also in small areas. The largest cod are concentrated north of 55 °N with additional higher concentration in the Polish zone of SD 25. The distribution of larger cod is relative similar to the general distribution of cod in the years before (see Oeberst, 2008).

Highest mean cpue values if flounder were observed in the length range from 17 cm to 35 cm in the total area (Figure 10.3). Spatial distribution of flounder is characterized by higher concentration in the area the Arkona Sea. High concentrations were observed in the shallow waters of the Swedish and Lithuanian coast of SD 28 (Figure 10.4). Very low concentrations of cod were observed in SD 25 and 26 taking into account the missing stations within the Russian zone.

Reference

Oeberst, R. 2008. Distribution pattern of cod and flounder in the Baltic Sea based on international coordinated trawl surveys. ICES CM 2008/J:09, 28 pp.

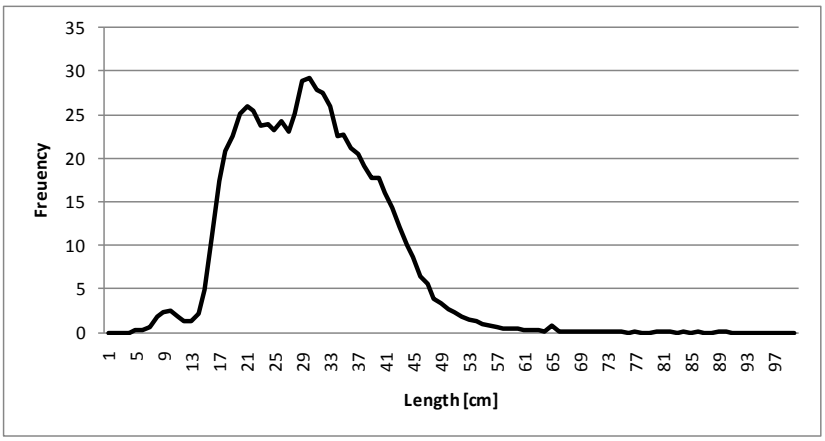


Figure 10.1. Mean cpue values of cod by length based on all hauls realized during the BITS in quarter 4 2009.

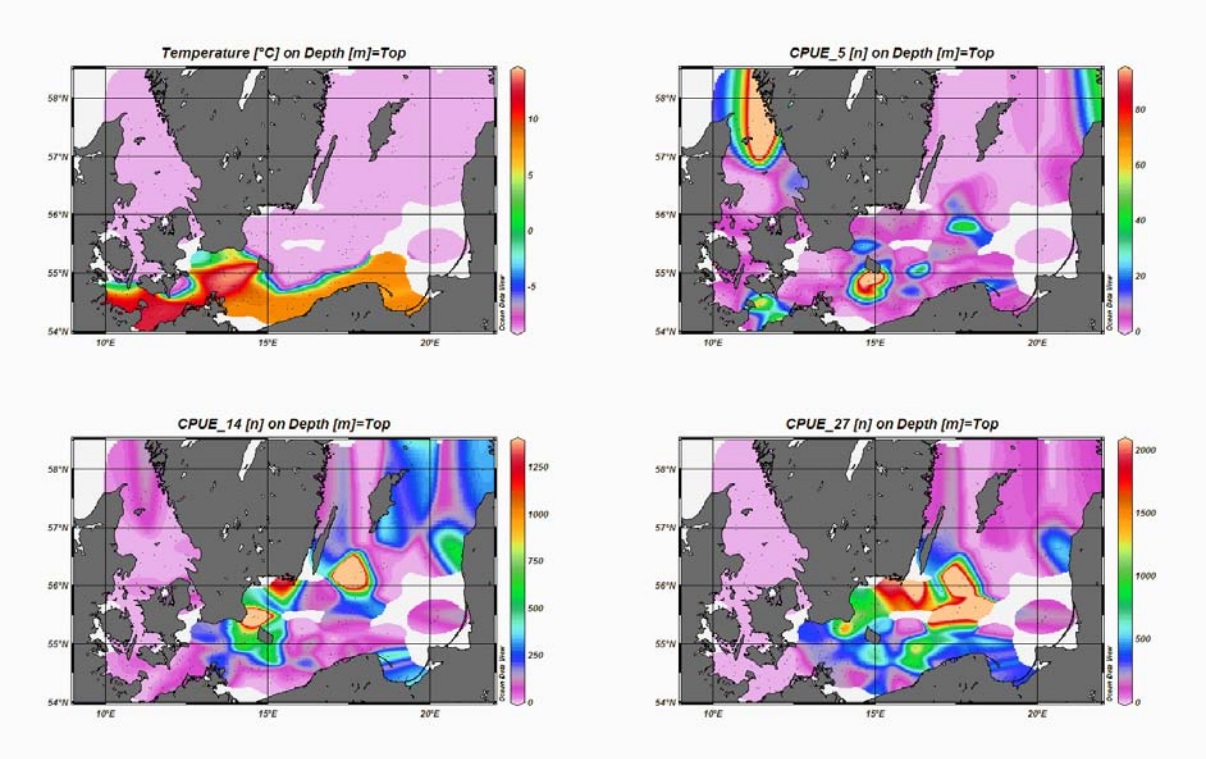


Figure 10.2. Density distribution of cod by length groups (5 cm to 13 cm, 14 cm to 26 cm and 27 cm to 50 cm) using VG gridding of ODV with x and y scale of 50. In addition distribution of temperature is given.

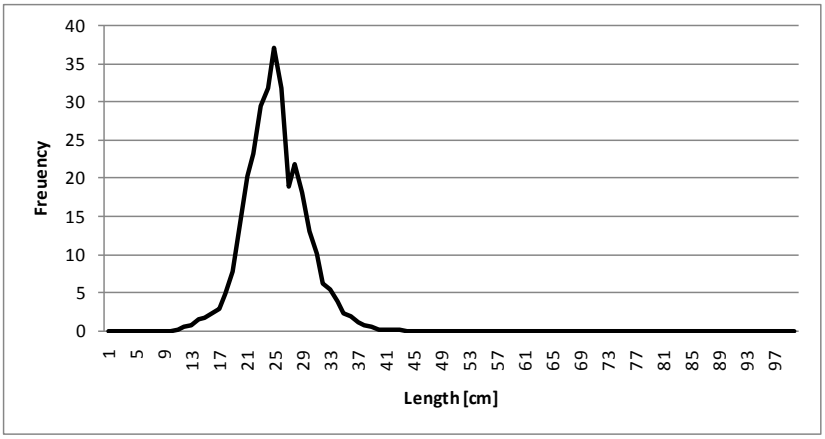


Figure 10.3. Mean cpue values of flounder by length based on all hauls realized during the BITS in quarter 4 2009.

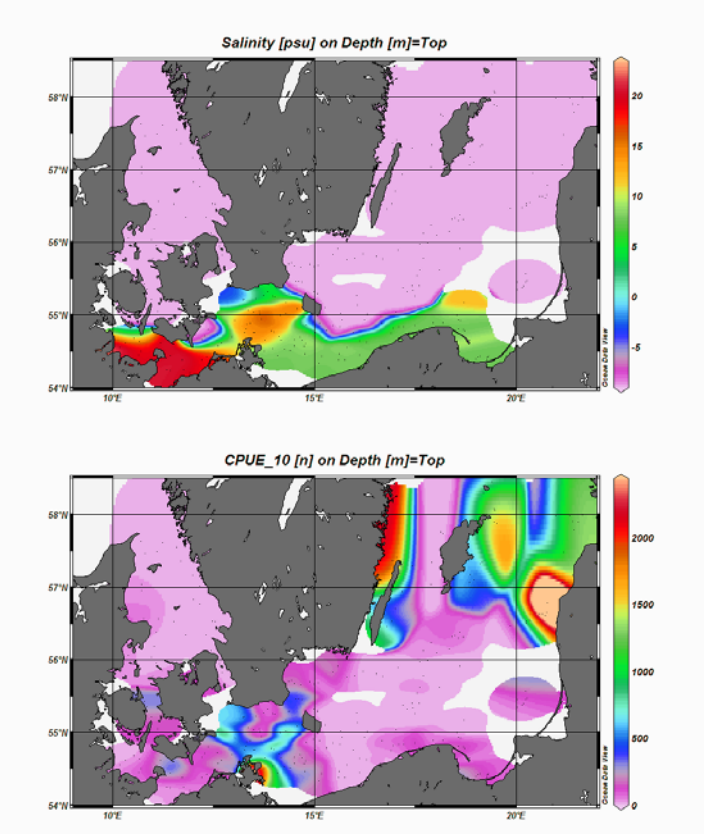


Figure 10.4. Density distribution of flounder using VG gridding of ODV with x and y scale of 50. In addition distribution of salinity is given.

10.1.2 BITS 1st quarter 2010

Altogether 265 hauls were planned for this survey. Unfortunately, the Danish and Lithuanian surveys were not finalized during the meeting of WGBIFS. Therefore, exact number of realized station was not possible, but, until now only 6 of 2004 stations were given with the validity code N (oxygen deficiency close to the bottom) and only four invalid hauls were reported. Because problems was not reported by both counties during the meeting it can be concluded, that the coverage during the BITS in spring 2010 corresponds to the planned coverage.

Standard reports giving overviews of the result of 1st and 4th quarter surveys from each country can be found in Annex 7. More detailed descriptions of most of the individual surveys can be found in Annex 6 (or Annex 8 if the report is presented as a working document).

10.1.2.1 Estimation of cod density within the Russian zone based on the remaining area

During summer 2009 Russia announced that the realization of the BITS in November 2009 is not possible and it is not clear whether the BITS in spring 2010 can be realized because of different reasons. That means that estimates of cod and flounder density in the Russian zone of ICES Subdivision 26 (SD 26) will not be available for both surveys with high probability, because the time was too short for getting permissions of other countries to work within the Russian zone. Therefore, data of the DATRAS database was used to evaluate the hypothesis that the cpue values in the different depth layers of the Russian zone can be estimated by means of the data from the other zones with sufficient accuracy (detailed descriptions and analyses are given in

"Estimation of cpue values in the Russian zone based on the cpue values of the remaining areas in SD 26"; Annex 8).

Data of fishing stations in SD between 2002 and 2009 were used for the study. The data were downloaded from the DATRAS database. In addition, estimates of temperature and salinity close to the bottom were downloaded from the ICES database of hydrographical data because data of temperature and salinity were not stored in the DATRAS database in the first years of the of the analysed period.

The cpue values (catch per unit of effort in units of TVL) of each station were assigned to one of the national economical zones of SD 26 independent which country realized the fishing station. cpue values were estimated for three length intervals of cod (9 cm to 19 cm, 20 cm to 34 cm and 35 cm to 50 cm). The mean cpue values of the Russian zone by depth layers were related to the mean cpue values of the remaining area of SD 26. In addition, it was checked whether the mean cpue values of the Russian zone can be explained by combination of the mean cpue values of different national zones.

The analyses revealed that estimates of the mean cpue values of the Russian zone based on the data sampled in the remaining area are very uncertain. Only for largest cod in depth layer 3 the mean cpue values of cod in the Russian zone could be estimated based on the mean cpue values of the Polish and Lithuanian zone with sufficient accuracy. The high patchiness of the distribution of cod within the total area of SD26 (see Figure 7 of the working document as example) is the reason for the low relation between the estimates of the different national zones. In many cases the cod is concentrated in small areas which are covered by 1 to 4 fishing stations. The incorporation of the temperature, salinity depth, latitude and longitude in GLM did not results in a higher accuracy of the explanation of the variability of the cpue values of cod in SD 26 (see Table 14 of the working document).

Conclusions

The density of cod expressed as cpue values in the Russian zone can only be estimated based on the cpue values of other national zones in SD 26 with high accuracy for larger cod in depth layer 3 (Table 12 of the working document).

The relative low effects of the hydrographical parameters related to the cpue values of cod support the hypothesis that larger areas can be combined into one unit, like the combination of depth layer 3 and 4, for improving the estimated stock indices by increase of the number of stations by strata.

The studies suggest further, that cod density within the western and eastern area of SD 26 significantly differ during autumn surveys. Therefore, it seems to be useful that the combination of SD 25 and SD 26 as one unit should be evaluated to improve the accuracy of the stock indices based on BITS.

The study clearly indicated that it is necessary that all areas are covered during BITS because estimates of a part of the total area of SD 26 based on the neighboring areas are very uncertain because of the high patchiness of the distribution of the different length groups of cod.

10.1.2.2 Estimates for quarter 4 in 2009

The relations between the mean cpue values in SD 26 and the mean cpue values in the area of SD 26 without the Russian zone in per cent were estimated by depth layer and length class from 2005 to 2008 (Tables 10.1.2.2.1 to 10.1.2.2.3). In addition, the

means over the total period was given. Estimates of depth layers 2 were not available because fishing stations within this depth layer were carried out within the Russian zone. The relations between the mean cpue values of the total area and the areas without the Russian zone varied in large ranges. The maximum variability was found in depth layer 5 where high cod densities of larger cod were observed outside the Russian zone in 2007 and low densities within the Russian zone. Although the relation between the mean densities of the analysed areas is uncertain it is proposed to use the means given in the tables for estimating the cod densities in total SD 26 in quarter 4 in 2009.

Table 10.1.2.2.1. Mean cpue values in SD 26 related to the mean cpue values in the area of SD 26 without the Russian zone in per cent by depth layer and year of cod with a length between 9 cm and 19 cm.

Depth layer	2005	2006	2007	2008	Mean
2					
3	120.1	314.5	110.4	128.8	168.5
4	130.1	123.8	136.0	109.2	124.8
5	100.0	112.7			106.3
6	100.0	101.1			100.6

Table 10.1.2.2.2. Mean cpue values in SD 26 related to the mean cpue values in the area of SD 26 without the Russian zone in per cent by depth layer and year of cod with a length between 20 cm and 34 cm.

Depth layer	2005	2006	2007	2008	Mean
2					
3	130.4	240.6	105.6	125.1	150.4
4	123.1	141.1	130.7	114.4	127.3
5	120.7	158.2	599.0		292.6
6	100.0	106.4			103.2

Table 10.1.2.2.3. Mean cpue values in SD 26 related to the mean cpue values in the area of SD 26 without the Russian zone in per cent by depth layer and year of cod with a length between 35 cm and 50 cm.

Depth layer	2005	2006	2007	2008	Mean
2					
3	155.4	223.5	103.5	125.3	151.9
4	132.8	190.4	144.4	140.5	152.0
5	128.7	213.0	4414.1		1585.3
6	100.0	149.1			124.6

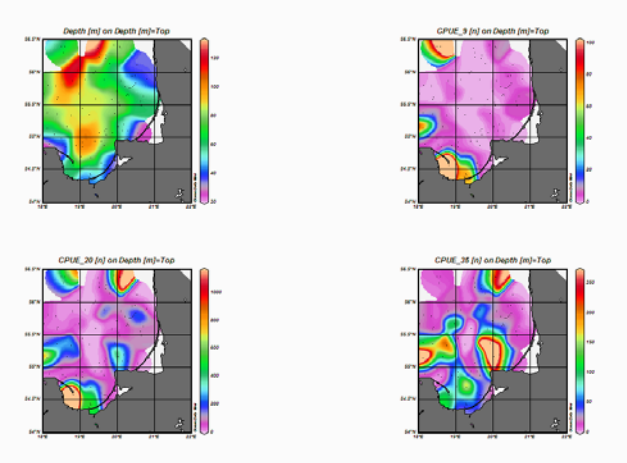


Figure 10.1.2.2.1. Spatial distribution of cod cpue values of length groups in SD 26 by in spring 2005. Figures are produced by VG Gridding with x and y scale-length of 100 with ODV. Left upper figure shows the estimated depth structure. The right upper figure shows the density distribution of cod from 9 cm to 10 cm. The left below figure presents the spatial density distribution of cod with length from 20 cm to 34 cm. The right below figure presents the spatial density distribution of cod with a length from 35 cm to 50 cm.

10.1.2.3 Recommendation to WGBFAS

The results of the BITS 4th quarter 2009 and BITS 1st quarter surveys 2010 can be used as basis for calculation of the indices. It is necessary to estimate the mean density of cod within the Russian zone based on the data of the remaining area in quarter 2009.

10.1.2.4 Update of the BITS standard reports

The standard tables for reporting the overview of the BITS were updated during the meeting to get higher unification. It was agreed that the defined depth layer used for the BITS are presented at the top of the annex which summarizes the reports of the participating countries (Table 10.1.2.4.1). Only these depth layers are used for the reports. Furthermore, it was recommended to use the format of the Table 10.1.2.4.2. Two version of gear types are only allowed as described in the DATRAS database, the TVL and TVS. Furthermore, cells of the table are not filled up with zero values.

Table 10.12.4.1. Depth layers defined for the BITS and corresponding depth range.

DEPTH LAYER	DEPTH RANGE
1	10 – 19 m
2	20 – 39 m
3	40 – 59 m
4	60 – 79 m
5	80 – 99 m
6	> 100m

Table 10.1.2.4.1.2. Overview of the number of planned fishing stations by ICES subdivision and depth layer

Stations fished

ICES SubDivisions	Gear (TVL,TVS)	Depth strata (1 -6)	Number of hauls planed	Number of valid hauls realized	Number of assumed zero-catch hauls	Number of replacement hauls	Number of invalid hauls	% stations fished
25	TVL	2						100
25	TVL	3	4	2				50
25	TVL	4	13	13			1	100
25	TVL	5	22	19	2		1	95
25	TVL	6	9	5	4			100
26	TVL	2						0
26	TVL	3						0
26	TVL	4						0
26	TVL	5	1	1				100
26	TVL	6	1	1				100

10.1.3 Danish Sole Survey

All 120 planned stations were covered in 2008, but one station was rejected as a result of technical problems. The surveys are conducted with trawls designed for sole fishery. Never the less, cpue, biomass, abundance and length frequencies are also estimated for cod, plaice and Norway lobster. The estimated values are hence probably underestimated, but because the trawl and the fishing stations are the same from year to year the values can be considered as indices.

10.1.3.1 Recommendation to WGBFAS

The results of the Danish sole survey 2009 can be used as basis for calculation of the indices.

10.1.4 Havfisken

No formal reports were available from the "Havfisken" survey I+II but it was reported that no problems were experienced which prevent the use of the results as indices for cod in Kattegat.

The results of the Havfisken survey (KASU) 2009 can be used as basis for calculation of the indices.

10.2 Suggestion for revision of the survey plans for the scientific surveys covering Kattegat

The Kattegat has been covered in 1st and 4th quarter by "Havfisken" since 1996 performing a bottom-trawl survey using the small standard TV3 trawl (TV3–520#). One haul has been made in each relevant ICES statistical Rectangle per survey. The time serial is an important input for the Kattegat cod stock assessment.

After the 2009 WGBIFS meeting the direction of the Institute of Marine Research in Lysekil decided not to perform bottom-trawl surveys as described in Section 10.3.1.1 in the report from the WGBIFS 2009. Instead acoustic echo counting of objects with a

target strength above a certain level will be performed in the Kattegat. No pelagic or demersal control hauls will be done. A pilot suevey was performed in autumn 2009.

The Danish Sole Survey covers the all part of Kattegat relevant to the sole indices and is targeting sole. The survey is done in 4th quarter and the gear used is the "Icelandic-sole-trawl".

Furthermore, Argos covers the Kattegat in 1st and 3rd quarters as part of the IBTS survey coordinated by the IBTSWG.

No revision of the survey effort in Kattegat was agreed.

11 Plan and decide on demersal trawl surveys and experiments to be conducted in autumn 2010 and spring 2011

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 2005 – 2009 was used based on the current used version of conversion factors which are stored in the DATRAS system.

The most institutes plan the same numbers of hauls during BITS surveys in autumn 2010 and spring 2011 as in the years before. Small variations did not lead to a significantly changed 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 realized the planned fishing stations within the own national economical zone. However, it must be pointed out that all countries are able to work also in economical zones of other countries to fulfill the requirements of the international coordinated surveys.

The total number of available stations (Table 11.1) was used in the combination with the results of relative distribution of stations by the ICES Subdivision and depth layer (Tables 11.2 and 11.3) to allocate the number of total planned stations by the ICES Subdivision and depth layer for the different surveys. Tables 11.4 and 11.5 present the allocated hauls by the ICES Subdivision and the depth layer for autumn survey in 2010. Furthermore, the number of hauls to be carried out by countries in the different Subdivisions is given. Tables 11.6 and 11.7 show the data corresponding for the survey in spring 2011.

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.

Russia will only cover the Russian zone during autumn survey 2010. During spring survey in 2011 Russia is able to work in the Polish and Swedish zone, too.

Estonia is participating at the 4 quarter BITS survey, performing 10 trawl hauls in the Estonian EEZ of Sd 28 and 29 only using the chartered commercial vessels. 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 and five stations within SD 29.

Table 11.1. Total numbers of stations planned by country during BITS in autumn 2010 and spring 2011.

Country	Vessel	Number of planned stations in autumn 2010	Number of planned stations in spring 2011
Germany	Solea	60	57
Denmark	Havfisken	23	23
	Total 22 + 24	**83**	**80**
Denmark	Dana	50	50
Estonia	Commercial vessel	10	
Finland			
Latvia	Chartered vessel	25	25
Lithuania	Darius	8	8
Poland	Baltica	29	39
Russia	Atlantniro/Atlantida	15	33
Sweden	Argos	30	50
	Total 25 - 28	162	200

Table 11.2. Basic data for allocating hauls for survey by ICES Subdivision.

ICES	Total area of the depth layer 10–120 m	Proportion of the SD (weight=0.6)	Running mean of the cpue value of age-groups 1+ (2005 – 2009)	Proportion of the index values (weight=0.4)	Proportion of the stations	Special decisions (additional stations)
Subdiv.	**[nm²]**	**[%]**		**[%]**	**[%]**	
22	3673	39	702	51	44	
23	0	0	0	0	0	3
24	5724	61	673	49	56	
Total	**9397**	**100**	**1375**	**100**	**100**	
25	13762	43	891	69	53	
26	9879	31	320	25	28	
27	0	0	0	0	0	10
28	8516	26	83	6	18	
Total	**32156**	**100**	**1293**	**100**	**100**	**2**

Table 11.3. Basic data for allocating hauls according to depth layer for survey by ICES Subdivision.

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+ (2005 - 2009)	Proportion of the depth layer (0.4) [%]	Proportion of the depth layer [%]
24	10 - 39	4174	73	572	33	57
	40 – 59	1550	27	951	55	38
	60 – 79	29	0.50	221	13	5
	Total	5724	100	1744	100	100
25	10 - 39	4532	37	944	29	34
	40 - 59	3254	26	1098	33	29
	60 - 79	3037	25	792	24	24
	80 -	1461	12	469	14	13
	Total	12284	100	3303	100	100
26	10 - 39	2379	23	566	35	28
	40 - 59	1519	15	586	37	24
	60 - 79	1911	19	246	15	17
	80 - 100	2872	28	181	11	21
	100 - 120	1504	15	19	1	9
	Total	10185	101	1598	100	100
27	10 - 39	1642	31	0	0	18
	40 - 59	1101	21	58	41	29
	60 - 79	996	19	83	59	35
	80 -	1596	30	0	0	18
	Total	5335	100	141	100	100
28	10 - 39	2589	39	26	6	26
	40 - 59	1598	24	59	13	20
	60 - 79	1101	16	446	77	41
	80 - 100	1389	21	17	4	11
	Total	6677	100	437	100	100

Table 11.4. Allocation of planned stations by country and ICES Subdivision in autumn 2010.

		Subdivision						
Country	Total	22	23	24	25	26	27	28
Denmark	73	20	3		50			
Estonia	10							5
Finland								
Germany	60	14		43				
Latvia	25					13		12
Lithuania	10					10		
Poland	29				23	6		
Russia	15					15		
Sweden	30				8		10	12
Total	244	34	3	43	81	44	10	29

Table 11.5. Allocation of planned stations by ICES Subdivision and depth layer in autumn 2010.

Sub-div.		22	23	24	25	26	27	28
Depth layer [m]								
10 – 39		34	3	24	27	12	3	7
40 – 59				16	24	10	2	6
60 – 79				2	20	8	2	12
80 – 100					10	9	3	4
100 – 120						4		
Total		34	3	42	81	43	10	29

Table 11.6. Allocation of planned stations by country and ICES Subdivision in spring 2011.

		Subdivision						
Country	Total	22	23	24	25	26	27	28
Denmark	73	20	3		50			
Estonia								
Finland								
Germany	57	14		43				
Latvia	25					6		19
Lithuania	8					10		
Poland	34				21	18		
Russia	33				11	22		
Sweden	50				23		10	17
Total	280	24	3	43	105	56	10	36

Table 11.7. Allocation of planned stations by ICES Subdivision and depth layer in spring 2011.

SUB-DIV.	22	23	24	25	26	27	28
DEPTH LAYER [M]							
10 – 39	34	3	24	35	16	3	9
40 – 59			16	31	13	2	7
60 – 79			2	26	10	2	15
80 – 100				13	12	3	5
100 – 120					5		
Total	34	3	42	105	56	10	35

12 Update and correct the tow database

12.1 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 2009 and partly of the survey in spring 2010 were used to update the Tow Database. Some stations were deleted (stones, wrecks, area with ammunitions, …) 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 2010 was not available before the meeting started. The missing feedback will be used immediately after submission by the countries. Then the version TD_2010V1.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.

12.2 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 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

12.2.1.1 Agreed guidelines to follow:

It was agreed that:

- The feedback of realized surveys should be submitted to Germany using the proposed standard format not later than **20 December** (autumn survey) **and immediately after spring survey.**
- It is not allowed to use the rock-hopper groundrope in the following areas:
- southern part of ICES Subdivision 24
- ICES Subdivision 25
- South-western part of ICES Subdivision 26
- 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 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".

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

The Manual for the Baltic International Trawl Surveys (BITS) from the WGBIFS meeting in March 2009 was reviewed and updated to reflect the present methods to use in the surveys. The new version of the manual is found in Addendum 1 in this report.

The changes and descriptions of the DATRAS exchange format in the BITS manual are dealt with in Section 16 about DATRAS in this report.

14 Review and update the Baltic International Acoustic Surveys (BIAS) Manual

Current review of the text of the BIAS manual (previously updated in 2009) as well as presentations and discussion during WGBIFS-2010 meeting has resulted in following agreed changes:

1) Due to some changes in the BAD1 database structure (chapter 6 in Addendum 2) the content (structure) of tables concerns the data exchange format, which should be submitted after every BIAS and BASS surveys to the designated the WGBIFS experts should also changed, according to the pattern presented in the Table 6.1 (Addendum 2). The new standard exchange format (Table 6.1) for the next BIAS surveys documents preparation is recommended. Required data on Baltic cod from the some countries BIAS surveys were recently incorporated to the BAD1 database.

2) In the chapter 4.1 (Gear), information about fishing gear currently applied for fish control-catches purposes were updated with following text: "The stretched mesh size in the codend of the pelagic trawl used in the ICES Subdivisions 22–24 and 25–32 should be 20 and 12 mm, respectively".

3) In the chapter 4.4 (Environment), required data on the oxygen content at fish catch-stations location was added.

4) In the chapter 6.1 (Exchange of survey results) the names of the WGBIFS experts currently designated for BIAS surveys data compilation was actualized and following text was incorporated: "The main results of the recently conducted the BIAS survey should be summarized and reported to the Baltic International Acoustic Surveys coordinators, i.e. Niklas Larson, Lysekil – Sweden (niklas.larson@fiskeriverket.se) and Uwe Boettcher, Rostock – Germany (uwe.boettcher@vti.bund.de), not later than end of February of the next year". … Moreover, required data on Baltic herring, sprat and recently added cod should be submitted in the BAD-1 format using the Excel spreadsheet. However, the above-mentioned data can be submitted additionally in the FishFrame 4.3 database format. The new FishFrame 5.0 database in relation to the BIAS surveys data uploading is still under final reconstruction.

5) Information about the target strength (TS) were partly supplemented (Table 5.7).

15 Combination of BITS with acoustic estimates in areas with oxygen deficiency

During the last meeting it was discussed whether the results of BIAS can be used for estimating the density of cod based on acoustic surveys in the pelagic waters. Unfortunately, the estimates of cod based on the acoustic surveys in October are not stored in the BIAS database. To improve the knowledge concerning the distribution of cod in the pelagic waters it was agreed that all countries which participates the international coordinated acoustic survey in October prepare estimates of cod based on the acoustic measurement (Sa values and fishing stations) by year, rectangle and total number of cod. In addition the length distribution of cod will be given by rectangle. If possible indices by age groups can be prepared. Optional the age–length keys from the BITS in November are used for estimating age based indices.

The data of the surveys from 2005 onwards will be sent to Uwe Böttcher until September 2010, and analyses of the data will be presented by Rainer Oeberst during the meeting of WG BIFS in 2011. Two options for submitting the data can be used. The data of cod can be submitted in the in the format of the acoustic database BIAS where number of cod is given for age. Additional option give the number of cod by length intervals as described below.

		Comment
CCODE	Jul-99	Like BIAS
SD	29	Like BIAS
RECT	48G9	Like BIAS
Flag	1	Like BIAS
SA	48.4	Like BIAS
SIGMA	2.3	Like BIAS
NTOT	162.6	Like BIAS
HC	Proportion of cod from NTOT	New information
Length in cm	Number of cod by length	
5		New information
6		
7		
8		
9		
10		
…		
…		
100		

The results of the acoustic experiments carried out by Denmark and Sweden in SD 25 and by Russia in SD 26 during the BITS of the last years, where acoustic estimations were carried out in combination with midwater trawls in areas with oxygen deficiency close to the bottom suggests that a substantial biomass of cod is aggregated in the pelagic. This is not taking into account in the indices calculated based on the traditional standard hauls using the standard bottom trawl. The data available will be made available to Rainer Oebers and further analyzed and summarized in 2010 as-

sisted by the countries involved. The results are used to verify the estimates of cod in the pelagic waters during the acoustic surveys about one month before for possibly incorporate BIAS survey cod data into cod index traditionally based on only standard bottom trawl hauls. Dependent on the statistical analyses it will be decided during the next meeting of WGBIFS whether an update of the survey design of the BITS is necessary and possible.

16 DATRAS

16.1 Haul validity (H_VAL)

In the 2009 WGBIFS report is was stated:

"The introduction of midwater trawling using midwater/pelagic gears has made it necessary to elaborate in the way the codes are used. As the H_Val code is used now, it expresses a mix of two types of information: general information of the validity of the haul in respect to how the gear has performed during the haul. (i.e. do the results represent the population fished) indicated by "V" and "I" and an indication of what type of haul it is indicated by "C", "N". Until now it has been unlikely to experience a conflict between the two information types, but the introduction of the midwater trawling and an additional need for indicating that extra stations are made compared to the stations allocated according to the station allocating procedure used for the BITS has changed that; e.g. if a midwater haul has been carried out un-successfully.

To account for this it is recommended that the variable is separated into two variables:

- H_Val ("V"=Valid, "I"=Invalid) and
- Station_type ("S"= Standard haul, "C"=Calibration haul, "N"=No oxygen at bottom (assumed zero catch), "A"= extra haul not allocated according to standard haul allocation procedure, "M"= trawling in the pelagic zone with midwater trawl).

Well knowing that it is not easy for ICES to introduce new variables in the common DATRAS exchange format, the second best solution is to extent the list of allowed values in the existing H_Val to all possible combination of the above mentioned values in two information types.

The selection of which stations should be included in calculation of standard indices for assessments will then be defined based on the combination of the two information types by the following rules:

included= "V" and ("S" or "N"),

not included= "I" and/or ("A" or "C" or "M")

The WGBIFS recommends that the issue is discussed in WGDIM in order to be discussed among other users of DATRAS as survey data storage.

It is recommended that the definition of the h_val coding in the DATRAS exchange format is changes in order to accommodate the suggested modifications in the use of the information hold by the variable. The issue should be discussed in WGDIM.

16.2 General update of the DATRAS exchange format description

The requested changes and updates in "Exchange BITS format specifications.doc" have been made following the documents "BITS-questions.doc" and "BITS exchange

format guidelines.xls", both made available by the ICES Secretariat to the BIFS Working Group. In addition, DATRAS website was visited to examine currently existing specifications of the database including ICES Reference Codes. Field by field examination of the Exchange format against suggested changes has been carried out on the forum of the BIFSWG and discussed in the Group. In some cases tests against proposed codes were done on the already uploaded data to examine screening programme results. All corrections made in BITS Exchange format can be tracked in the attached file titled "Exchange Format BITS Manual 100320 CHANGES TRACKED.doc". As the Group has some comments regarding proposed changes and screening programme testing results, these are separately addressed in the text below.

A general comment is to have one standard value for all missing or unknown data in all fields, say -9.

1) Field Day/Night in HH record. It should be given the description/method how ICES determines D/N. That sort of description will be useful for people developing coding for National Databases.

2) If the field Depth (HH record) is filled with proposed -9 then screening programme is reporting "warning".

3) If HaulVal (HH record) = proposed A (additional trawl) then Field A is inconsistent with field B in child record (rel) error A;1 HaulVal; SpecVal. Screening the same data with changed SpecVal for 0 instead of 1 resulted in the same screening report "Field A is inconsistent with field B in child record (rel) error HaulVal;SpecValv". Neither proposed M is accepted. See also chapter 17 for a suggestion of a general revision of the variable HaulVal.

4) Filling the field HydroStNo (HH record) with zero has no effect on screening programme (is accepted) while -9 is reported as a warning. The Group does not support the zero option in HydrStNo.

5) Data on WarpDen (HH record) Range have been incorporated from a figure already existing in the BITS Manual.

6) In the field TowDir (HH record) 360 degrees indicates trawling towards North, 999 for varying direction is suggested to indicate considerable differences between tow distance and shoot and haul positions of the fishing station.

7) It is suggested to add "999 – varying direction" as an additional comment in the field Comments of the field WindDir (HH record) to indicate wind coming from varying directions.

8) Similar comment shall be added in the field SwellDir (HH record).

9) SpecCodeType (HL record) is suggested by the Group to use only TSN code instead of having two options, unless for some reasons unknown to the Working Group both codes are necessary to be used optionally. Having two options might lead to possible inconsistency.

10) Regarding the fields LngtCode and LngtClass (HL record) the Group is of the opinion that millimetre shall be used as input standard regardless of the actual measuring unit. The reason for suggesting Ddec1 in the field Key of LngtClass (HL record) is not clear for the Group considering the present format. Even applying 0.5 cm unit length classes does not result in decimals.

11) SpecCodeType and SpecCode (CA records) shall be only allowed to use TSN (similarly to point 10 comments).

12) Despite of the suggestion to change the Range in the field AgeRings (CA record), the Group finds rationale to keep AgeRing limit 99. There are known cases of slow growing herring of the age above 15. Investigations on new ageing methods of flatfish may reveal the age exceeding the proposed limit of 15 rings. In the Range and Comments spaces have been deleted and -9 is proposed instead as unknown to be consistent with point 1 of the document "BITS-questions.doc" suggesting no empty fields to be applied.

17 Suggestion for change of the common survey trawl for BITS

Damage of the survey gear is a returning problem for several research vessels. The damage is often happening in the first part of the lower panel in the codend. To reduce trawl damages in the netting Denmark suggests a small change of the twine thickness of the bottom-trawl survey standard gear. Denmark will circulate a document to Germany, Poland, Russia and Sweden that informs about the technical specifications of the modification of the gear. Based on the outcome of consultations of the national gear specialists WGBIFS will decide if the suggested changes can be agreed. The decision from WGBIFS should be circulated in due time before the 2010 autumn survey.

18 Ensure that the data collection is appropriate to studies of biological diversity

In 1997, the ministers of the North Sea states and European Union agreed on an ecosystem approach to marine environment based, among other issues, on:

- Identifying processes and influences critical to maintaining the structure, functioning, productivity and biological diversity of the marine ecosystems.

The Council Regulation (EC) No 199/(2008) points out the main goals of the multiannual Community Data Collection Programme as a source of all biological data needed to assess the status of exploited stocks;

- Ecosystem data needed to evaluate the impact of fishing activities on the marine ecosystem;

The Commission Decision 949 (2008) postulates the a number of indicators of fisheries effects on the marine ecosystem what inter alia, include the indicator of biodiversity to be used for synthesizing, assessing and reporting trends in the biodiversity of vulnerable fish species (Conservation status of fish species). This indicator requires species, length and abundance from fisheries independent research survey(s) for relevant marine region. Accurate reporting of these indicators requires that all species that are consistently and reliably identified.

In this respect, the BITS and BIAS as the part of community data collection activities serve as important data source which should allowing monitoring the trends in biodiversity. Therefore, the ability of countries to provide the joint database (DARTAS) with reliable species-specific data has a crucial importance

The ICES workshop on Taxonomic Quality Issues in the DATRAS Database, after scrutinizing the data provided to DATRAS database by the participants of IBTS, reported about many obvious errors and inconsistencies that could have a major influence on the interpretation of the results of various community analyses as well as on the trends in abundance and distribution maps of specific species. However, although errors may be inferred from consistency checks, the appropriate correction is problematic, because their origin remains unknown (ICES, 2007 WKTQD). Consequently the quality of taxonomic data provided by the participating countries has of crucial value. The WKTQD also indicated the lack of good taxonomic knowledge among scientific staff as a generic disadvantage.

The BIFSWG 2010, discussing the issue came to the agreement that DATRAS database should be scrutinized accordingly with respect to Baltic Sea species. Given the smaller number of taxa, it should not be a major problem.

Raw DATRAS data cannot be used for certain types of diversity studies without prior data manipulation to standardize treatment of species reported at different taxonomic levels. Any quantitative results of the analysis will thus depend on the actual routine used to combine or to split taxa and therefore, it would be appropriate to develop a standard protocol for using DATRAS information in the context of community studies, because only this can ensure that the analyses give similar results when they are repeated in future. The WKTQD provided a first draft of a standardized algorithm for treatment of taxonomic data (adapted from Daan *et al*., 2005).

The Workshop also suggested development of improved protocols to ensure that species identification in trawl surveys is appropriate to fish community studies, including the development of photo-ID keys for nations participating in surveys.

The same approach should be considered within the context of Baltic Sea survey data.

The WG found that ICES should provide a list of taxa reported in the BITS dataset within DATRAS with numbers reported and also list of "problematic taxa" in DATRAS (e.g. gobids, sandeels, sticklebacks) in order to achieve the consistency in species list uploaded by the participating countries. Additionally the spatial distribution pattern of all uploaded in DATRAS database species during the last 5 years should be analysed.

The WGBIFS is of opinion that in the DATRAS database there must be added an option for downloading of data on ALL uploaded species.

Another important issue within the context of biodiversity information is the inclusion of possible new species to the DATRAS. The changes on the distribution pattern of fish species e.g. as a consequence of ecosystem changes provide valuable information on dynamics in biodiversity. However, in order to avoid possible misinterpretations the uploaded data on rare species should be scrutinized with respect to errors.

19 Sampling of flatfish in the Baltic

It was a recommendation to the last years BIFS meeting that the sampling of flatfish in the Baltic region was generally straightened and a particular recommendation from WKARFLO to sample ageing samples from flounder. A table giving the status of the general sampling level of flatfish is given below. All countries are now conducting sampling of flounder, turbot, brill, plaice and dab as standard routine during BITS and/or from commercial landings for all of the above mentioned species if they appear in the catches. All countries, except Denmark process the data and forward the data to the WGBFAS. The reason for Denmark not to process the data are that no

national expertise is available for some of the species (brill, turbot, dab, flounder) and the amount of samples collected is to sparse to maintain such experience. DTU. Aqua has tried to outsource the job without any luck. RCM Baltic is requested to come up with a solution.

Table 19.1. Status of the sampling of flatfish in the Baltic.

C = collected by not processed.

✓= collected, processed and reported.

Country	Type of information	Flounder		Plaice		Turbot		Brill		Dab	
		BITS	Comm. Sampl.	BITS	Comm. Sampl.	BITS	Comm. Sampl.	BITS	Comm. Sampl.	BITS	Comm. Sampl.
Germany	Sex specific length freq.	✓ 1)	No	✓ 1)	No	✓ 1)	No	✓ 1)	No	✓ 1)	No
	Maturity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Age	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sweden	Sex specific length freq.										
	Maturity	✓	✓		✓		✓		✓		✓
	Age	✓	✓		✓		✓		✓		✓
Lithuania	Sex specific length freq.	✓ 1)	✓ 1)		No catches		No catches		No catches		No catches
	Maturity	✓	✓								
	Age	✓	✓								
Russia	Sex specific length freq.	✓	✓		No catches	✓	✓		No catches		No catches
	Maturity	✓	✓			✓	✓				
	Age	✓	✓			✓	✓				
Latvia	Sex specific length freq.	✓	✓		No catches	✓			No catches		No catches
	Maturity	✓	✓			✓					
	Age	✓	✓			✓					
Denmark	Sex specific length freq.		C	C		C		C		C	
	Maturity		No	No		No		No		No	
	Age		C	C		C		C		C	
Estonia	Sex specific length freq.	✓	✓		No catches	✓	✓		No catches		No catches
	Maturity	✓	✓			✓	✓				
	Age	✓	✓			✓	✓				
Poland	Sex specific length freq.	✓	No	✓	No	✓	No		No catches		No catches
	Maturity	✓	✓	✓	✓	✓	✓				
	Age	✓	✓	✓	✓	✓	✓				
Finland	Sex specific length freq.				No catches				No catches		No catches
	Maturity										
	Age	✓									

1) From 4th quarter 2010 and on

RCM Baltic is requested to make guideline how biological flatfish data should be processed when the data collected is too sparse to maintain national expertise.

20 Quality assurance and background documentation of acoustic data

WGBFAS recommended that WGBIFS has to improve the quality of the sprat and herring tuning fleet indices by explaining the larger differences found when comparing the old and the new indices. Therefore the latest versions of BIAS and BASS databases in MS Access format (see for more details in Chapter 5.1) were used to calculate the area corrected abundance and biomass estimates for herring and sprat. BIAS database includes acoustic data from the years 1991–2009 and BASS database from 2001–2009. **These new acoustic survey indices were first compared with the revised indices used by WGBFAS in 2009. The comparison results are presented in following tables and commented below.**

SPRAT in SD 22-32. Tuning Fleet/InternationalAcoustic Survey in SD 24-28
International Acoustic Survey in May corrected by area surveyed (Catch: Millions) (WGBFAS 2009)

Year	Fish. Effort	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8+
2001	1	8322	36412	13010	37889	5449	4804	4717	630
2002	1	27439	19133	37184	19104	14974	2547	3711	2685
2003	1	27313	16662	8514	15855	5668	7364	1720	3769
2004	1	139812	68118	16020	11115	13050	3296	8068	6572
2005	1	4402	91314	23823	7313	3593	2827	1873	2308
2006	1	13783	8242	78851	21526	5847	2008	1570	2016
2007	1	53027	29438	6506	36976	7692	1292	540	720
2008	1	9163	41157	20519	5706	21703	4320	777	1538

NEW_INDEX_BASS_SPRAT 2010-03-08

YEAR	SPR_TOTAL	SPR_AGE1	SPR_AGE2	SPR_AGE3	SPR_AGE4	SPR_AGE5	SPR_AGE6	SPR_AGE7	SPR_AGE8
2001	111 233	8 322	36 412	13 010	37 889	5 449	4 804	4 717	630
2002	126 777	27 439	19 133	37 184	19 104	14 974	2 547	3 711	2 685
2003	86 865	27 313	16 662	8 514	15 855	5 668	7 364	1 720	3 769
2004	266 052	139 812	68 118	16 020	11 115	13 050	3 296	8 068	6 572
2005	137 452	4 402	91 314	23 823	7 313	3 593	2 827	1 873	2 308
2006	133 843	13 783	8 242	78 851	21 526	5 847	2 008	1 570	2 016
2007	136 190	53 027	29 438	6 506	36 976	7 692	1 292	540	720
2008	104 881	9 163	41 157	20 519	5 706	21 703	4 320	777	1 538
2009	142 986	40 705	27 209	36 819	10 775	16 870	6 012	3 586	1 009

Relation (new/old)*100

YEAR	SPR_TOTAL	SPR_AGE1	SPR_AGE2	SPR_AGE3	SPR_AGE4	SPR_AGE5	SPR_AGE6	SPR_AGE7	SPR_AGE8
2001		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2002		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2003		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2004		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2005		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2006		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2007		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2008		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

No differences were found between new and old Baltic Acoustic Spring Survey (BASS) indices.

In year 2009 data the abundance of sprat at age 5 (week year-class of 2004) is unexpectedly high. It is much higher than the abundance of the same year-class in previous years. At the same time, the abundance of a very abundant sprat year-class of 2003 is very low in 2009 compared to the previous years. The data in BASS database have been checked to find an explanation for that phenomenon. The following conclusions were made:

- The 2009 BASS data come exclusively from the journey WAH09 (German research vessel "Walther Herwig III") and the basic data in the database are consistent with the values calculated from the survey.
- There are no obvious data errors; a query error would affect also other year-classes.
- The increase in the 2004 year-class does not result from a restricted area; it occurs in SD 24, 25 and 28.

- The increasing trend of the 2004 year-class is present also in the BIAS data (in SD 23, 25 and 28) in 2009.
- If these abundance figures in 2009 are incorrect, then it is most likely caused by mistakes made in sprat age reading. (The 2003 abundant year-class has outstandingly slow growth. In 2009, 6-year old sprats were smaller than sprats at age 5 and about the same size as 4-year old sprats. If the slowly growing fish gets older, it can be difficult to distinguish the last ring close to the edge of the otolith.)

SPRAT in SD 22-32. Tuning Fleet/InternationalAcoustic Survey in SD 24-29
International Acoustic Survey corrected by area surveyed (Catch: Millions) (WGBFAS 2009)

Year	Fish. Effort	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8+
1983	1	44544	11578	10376	2434	409	274	156	12
1984	1	16132	27941	6751	2339	264	73	104	89
1985	1	5095	15017	12048	2799	425	116	82	82
1986	1	1625	8445	11811	3468	497	34	27	45
1987	1	15937	4315	9945	4293	1427	254	26	29
1988	1	996	8184	4624	5261	2315	269	38	16
1989	1	39567	3333	23902	5371	2915	1985	1947	324
1990	1	14715	32166	6872	5566	2124	1082	244	56
1991	1	46757	40678	43961	2636	8949	1806	1936	3066
1992	1	37198	26995	24210	9383	1927	2448	717	562
1993	1	-11	-11	-11	-11	-11	-11	-11	-11
1994	1	12419	44951	43375	17270	11992	5135	1031	1579
1995	1	-11	-11	-11	-11	-11	-11	-11	-11
1996	1	71098	133404	20743	23382	12833	6453	3742	1337
1997	1	-11	-11	-11	-11	-11	-11	-11	-11
1998	1	102117	22027	56075	36949	8177	4856	1675	1062
1999	1	4800	91193	15963	36152	39243	5294	3364	1787
2000	1	59850	5247	51137	5716	14279	16174	1599	2760
2001	1	12106	36310	6893	30750	4052	9741	6474	2446
2002	1	31609	14576	37804	5810	19245	2654	5167	4419
2003	1	100952	32807	24208	23605	8072	13417	4866	8745
2004	1	120369	47660	11822	8040	4992	2472	2452	3640
2005	1	7133	125952	48898	10167	5194	3051	2391	3349
2006	1	37156	11959	105232	32994	8164	4692	2165	3031
2007	1	55269	27616	10481	33036	14113	1274	664	2370
2008	1	29294	45998	20783	5440	19251	5799	1267	19

NEW_INDEX_BIAS_SPRAT 2010-03-18

YEAR	SPR_TOTAL	SPR_AGE1	SPR_AGE2	SPR_AGE3	SPR_AGE4	SPR_AGE5	SPR_AGE6	SPR_AGE7	SPR_AGE8
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

Relation (new/old)*100

YEAR	SPR_TOTAL	SPR_AGE1	SPR_AGE2	SPR_AGE3	SPR_AGE4	SPR_AGE5	SPR_AGE6	SPR_AGE7	SPR_AGE8
1991		100.5	100.0	100.0	100.0	100.0	100.0	100.0	100.2
1992		100.4	101.3	100.9	100.5	100.9	100.2	100.0	100.2
1993									
1994		101.1	100.4	100.6	101.2	100.5	100.3	100.3	100.0
1995									
1996		100.4	100.4	101.7	101.1	101.1	100.6	100.7	100.3
1997									
1998		100.4	100.8	100.5	100.3	100.3	100.0	100.0	100.2
1999		102.2	100.1	100.8	100.1	100.0	100.0	100.0	100.0
2000		100.1	101.4	100.1	100.6	100.0	100.0	100.0	100.0
2001		101.0	100.3	101.2	100.1	100.3	100.1	100.0	100.1
2002		100.6	100.4	100.1	100.4	100.1	100.1	100.0	100.0
2003		100.0	100.0	100.4	100.3	100.3	100.1	100.0	100.0
2004		101.3	100.4	100.6	100.2	100.1	100.0	100.1	100.0
2005		100.9	100.5	100.8	100.1	100.1	100.0	100.0	100.0
2006		100.3	100.8	100.5	100.2	100.0	100.0	100.1	100.0
2007		95.0	80.1	79.5	80.6	70.7	86.7	72.1	67.9
2008		100.4	99.5	98.6	99.4	99.6	99.4	100.0	10221.1

In 1993, 1995 and 1997 the Baltic International Acoustic Survey (BIAS) did not cover all ICES Subdivisions which are needed for calculation of sprat abundance index. Therefore the sprat abundance indices from these three years are not usable for tuning purpose. *WGBIFS recommends not to use the 1+ old sprat abundance indices based on BIAS data from the years 1993, 1995 and 1997 for tuning.*

The small differences between old and new BIAS sprat abundance indices in years 1991–2006 are caused by the update of historical data in the BIAS database (see Chapter 5.3). The remarkable differences between old and new BIAS sprat abundance indices in years 2007 and 2008 were caused by the mistakes made during the index calculation in 2009 (see Chapter 5.3).

SPRAT in SD 22-32. Tuning Fleet Acoustic Survey in SD 26+28
Latvian/Russian acoustic on age 0 in SD 26+28 shifted to represent age 1 (WGBFAS 2009)

Year	Fish. Effort	Age 1
1994	1	2221
1995	1	38555
1996	1	27810
1997	1	3285
1998	1	39334
1999	1	682
2000	1	22249
2001	1	3466
2002	1	6410
2003	1	31780
2004	1	61462
2005	1	2074
2006	1	18202
2007	1	23831
2008	1	2876

NEW_INDEX_BIAS_SPRAT_0-group SD 26 and 28

YEAR	AGE	SummevonN_corr	Relation (new/old)*100
1993	0	2 221	100.0
1994	0	38 555	100.0
1995	0	27 810	100.0
1996	0	3 287	100.1
1997	0	39 334	100.0
1998	0	682	100.0
1999	0	22 249	100.0
2000	0	3 466	100.0
2001	0	6 410	100.0
2002	0	31 780	100.0
2003	0	61 462	100.0
2004	0	2 074	100.0
2005	0	18 202	100.0
2006	0	23 831	100.0
2007	0	3 144	109.3
2008	0	53 263	
2009	0	6 363	

The small difference between old and new BIAS 0-group sprat abundance indices in year 1997 are caused by the update of historical data in the BIAS database (see Chapter 5.3). Larger difference between old and new BIAS 0-group sprat abundance indices in 2008 was caused by the mistake made during the index calculation in 2009 (see Chapter 5.3).

Herring in SD 25-29, 32 (excl. GOR).
XSA input: Tuning Fleet/International Acoustic Survey (WGBFAS 2009)

Year	Fish. Effort	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8+
1982	1	7398	10609	3863	2219	2178	1690	983	1582
1983	1	3583	5854	5939	2605	1682	1829	1275	2063
1984	1	7522	6769	6841	5413	1871	1150	769	1148
1985	1	3649	8240	4466	3764	1289	593	454	603
1986	1	4065	9199	10088	4589	3206	1020	420	587
1987	1	6945	2677	5692	5914	2237	1305	407	210
1988	1	1537	5210	2531	5638	4725	1912	965	498
1989	1	6046	2840	7835	3202	4812	2815	1147	544
1990	1	11954	10075	6016	5433	3176	2611	1341	1136
1991	1	6739	19731	11477	4029	9728	2508	2295	2474
1992	1	7445	9217	13327	7256	4217	2346	1595	1214
1993	1	-11	-11	-11	-11	-11	-11	-11	-11
1994	1	3939	11992	20607	11770	5804	2158	965	858
1995	1	-11	-11	-11	-11	-11	-11	-11	-11
1996	1	3998	13905	10085	7410	4613	2411	1209	801
1997	1	-11	-11	-11	-11	-11	-11	-11	-11
1998	1	4312	2199	6717	6643	2651	1558	816	443
1999	1	1762	4772	3233	4293	3740	1461	852	643
2000	1	10168	2571	9931	4855	5226	3262	3022	2073
2001	1	4053	8242	3308	4704	1583	1251	869	473
2002	1	2699	4298	6581	2883	2386	895	763	471
2003	1	16868	9204	10887	6819	2378	1812	778	1193
2004	1	4942	13388	6905	4774	2539	1163	613	694
2005	1	1929	8302	15543	7243	4455	2604	1121	1156
2006	1	7346	8107	12793	21290	7386	3095	1712	1219
2007	1	5428	6718	3076	4330	7304	1753	920	860
2008	1	6782	6850	7697	3753	5146	3619	880	807

new_INDEX_BIAS_HER **2010-03-18**

YEAR	HER_TOTAL	HER_AGE1	HER_AGE2	HER_AGE3	HER_AGE4	HER_AGE5	HER_AGE6	HER_AGE7	HER_AGE8
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

Relation (new/old)*100

YEAR	HER_TOTAL	HER_AGE1	HER_AGE2	HER_AGE3	HER_AGE4	HER_AGE5	HER_AGE6	HER_AGE7	HER_AGE8
1991		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1992		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1993									
1994		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1995									
1996		100.1	100.1	100.2	100.3	100.4	100.3	100.3	100.2
1997									
1998		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1999		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2000		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2001		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2002		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2003		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2004		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2005		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2006		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2007		99.9	99.1	98.3	98.8	98.6	98.3	97.0	94.9
2008		99.6	98.9	98.9	98.0	96.9	96.1	95.8	98.9

In 1993, 1995 and 1997 the Baltic International Acoustic Survey (BIAS) did not cover all ICES Subdivisions which are needed for calculation of herring abundance index. Therefore the herring abundance indices from these three years are not usable for tuning purpose. *WGBIFS recommends not to use the herring abundance indices based on BIAS data from the years 1993, 1995 and 1997 for tuning.*

The small differences between old and new BIAS herring abundance indices in years 1991–1996 are caused by the update of historical data in the BIAS database (see Chapter 5.3). Larger differences between old and new BIAS herring abundance indices in years 2007 and 2008 were caused by the mistakes made during the index calculation in 2009 (see Chapter 5.3).

Secondly the new acoustic survey indices were compared with the unrevised indices used by WGBFAS in 2008. The comparison results are presented in following tables and commented below.

SPRAT in SD 22-32. Tuning Fleet/InternationalAcoustic Survey in SD 24-28
International Acoustic Survey in May corrected by area surveyed (Catch: Millions) (WGBFAS 2008)

Year	Fish. Effort	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8+
2001	1	14366	56327	21268	66193	9169	7555	9103	1192
2002	1	29355	29530	56045	32508	23656	4189	5665	5575
2003	1	45557	25655	12984	25266	8319	12051	2914	6608
2004	1	228463	116764	24897	16627	21709	4958	13549	11300
2005	1	8222	171383	43274	16510	7758	5601	4029	4104
2006	1	26215	10480	111689	33826	8466	2764	1946	2493
2007	1	56070	30761	7364	38232	8053	1668	573	707

Relation (new/old)*100

YEAR	SPR_TOTAL	SPR_AGE1	SPR_AGE2	SPR_AGE3	SPR_AGE4	SPR_AGE5	SPR_AGE6	SPR_AGE7	SPR_AGE8
2001		57.9	64.6	61.2	57.2	59.4	63.6	51.8	52.9
2002		93.5	64.8	66.3	58.8	63.3	60.8	65.5	48.2
2003		60.0	64.9	65.6	62.8	68.1	61.1	59.0	57.0
2004		61.2	58.3	64.3	66.8	60.1	66.5	59.5	58.2
2005		53.5	53.3	55.1	44.3	46.3	50.5	46.5	56.2
2006		52.6	78.6	70.6	63.6	69.1	72.6	80.7	80.9
2007		94.6	95.7	88.3	96.7	95.5	77.5	94.2	101.8

The new estimate for the years 2001–2009 is based on the corrected MS Access database BASS_DB. In the old index tables the origin of the numbers is partially unknown. Therefore the old figures do not necessarily correspond to the new numbers. So much is known that the BASS values from 2001 to 2006 were in addition to the SD-area-correction further extrapolated to the BIAS standard area (SD 24–29 e.g. multiplied by a factor of 1.45) to get comparable sprat abundance values. Starting from the year 2007 this additional and for the tuning index also useless area correction was not any more applied. As the BASS area coverage has varied from year to year, also the ratio of the new and old index varies accordingly.

SPRAT in SD 22-32. Tuning Fleet/InternationalAcoustic Survey in SD 24-29
International Acoustic Survey corrected by area surveyed (Catch: Millions) (WGBFAS 2008)

Year	Fish. Effort	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8+
1983	1	44544	11578	10376	2434	409	274	156	12
1984	1	16132	27941	6751	2339	264	73	104	89
1985	1	5095	15017	12048	2799	425	116	82	82
1986	1	1625	8445	11811	3468	497	34	27	45
1987	1	15937	4315	9945	4293	1427	254	26	29
1988	1	996	8184	4624	5261	2315	269	38	16
1989	1	39567	3333	23902	5371	2915	1985	1947	324
1990	1	14715	32166	6872	5566	2124	1082	244	56
1991	1	48085	43613	44120	4376	9266	2303	1941	3227
1992	1	36510	26723	23896	9220	1897	2424	711	555
1993	1	51652	53499	27846	21983	7890	1617	2580	2024
1994	1	10531	45868	43410	17435	11847	5165	1023	1552
1995	1	184705	24230	55410	33085	14553	8174	2327	1393
1996	1	70537	133387	19524	23318	12613	6324	3640	1273
1997	1	12513	84652	90901	11049	13013	4256	3115	856
1998	1	100246	21541	55079	36508	8077	4825	1636	1082
1999	1	4796	101836	17319	42453	44890	5990	3611	1722
2000	1	57351	2751	52184	5924	14771	13185	1650	2700
2001	1	10011	31526	6977	30822	4452	11546	8061	3612
2002	1	31012	14352	36715	5716	18719	2637	5037	4344
2003	1	98387	32179	24070	24309	7916	13389	2815	10875
2004	1	124332	49586	12021	8177	5111	2584	2486	3606
2005	1	6997	123997	48131	9982	5084	2992	2350	3308
2006	1	36407	11678	102769	32353	7933	4583	2109	2947
2007	1	51417	21597	8088	26072	9796	1067	470	1578

Relation (new/old)*100

YEAR	SPR_TOTAL	SPR_AGE1	SPR_AGE2	SPR_AGE3	SPR_AGE4	SPR_AGE5	SPR_AGE6	SPR_AGE7	SPR_AGE8
1991		97.7	93.3	99.7	60.3	96.6	78.4	99.7	95.2
1992		102.3	102.4	102.3	102.3	102.5	101.2	100.8	101.4
1993									
1994		119.2	98.4	100.6	100.2	101.7	99.7	101.1	101.7
1995									
1996		101.2	100.4	108.1	101.4	102.8	102.7	103.6	105.3
1997									
1998		102.3	103.1	102.3	101.5	101.5	100.6	102.4	98.3
1999		102.3	89.7	92.9	85.3	87.4	88.4	93.2	103.8
2000		104.4	193.4	98.0	97.1	96.7	122.7	96.9	102.2
2001		122.1	115.5	99.9	99.9	91.3	84.4	80.3	67.8
2002		102.6	102.0	103.1	102.0	102.9	100.7	102.6	101.7
2003		102.6	101.9	101.0	97.4	102.3	100.3	172.9	80.4
2004		98.1	96.5	99.0	98.5	97.7	95.7	98.7	100.9
2005		102.9	102.1	102.4	102.0	102.2	102.0	101.8	101.2
2006		102.4	103.2	102.9	102.2	103.0	102.4	102.8	102.9
2007		102.1	102.5	103.0	102.1	101.9	103.6	101.9	102.0

In 1993, 1995 and 1997 the Baltic International Acoustic Survey (BIAS) did not cover all ICES Subdivisions which are needed for calculation of sprat abundance index. Therefore the sprat abundance indices from these three years are not usable for tuning purpose.

The small differences between old and new BIAS sprat abundance indices in years 1991–2007 are caused by the update of historical data in the BIAS database. In the old index tables the origin of the numbers is partially unknown. The remarkable differences between old and new BIAS sprat abundance indices in some years can be caused by the wrong rectangle references, missing or wrong area-corrections, or finger mistakes (e.g. in year 2003 probably the values of age-group 7 and 8 in the output data are exchanged because the total numbers of abundance agree quite well).

SPRAT in SD 22-32. Tuning Fleet Acoustic Survey in SD 26+28
Latvian/Russian acoustic on age 0 in SD 26+28 shifted to represent age 1 (WGBFAS 2008)

Year	Fish. Effort	Age 1
1994	1	4755
1995	1	39314
1996	1	27245
1997	1	2236
1998	1	40179
1999	1	691
2000	1	22839
2001	1	4313
2002	1	6465
2003	1	32163
2004	1	62525
2005	1	2256
2006	1	18348
2007	1	24705

YEAR	Relation (new/old)*100
1994	46.7
1995	98.1
1996	102.1
1997	147.0
1998	97.9
1999	98.7
2000	97.4
2001	80.4
2002	99.1
2003	98.8
2004	98.3
2005	91.9
2006	99.2
2007	96.5

The small difference between old and new BIAS 0-group sprat abundance are caused by the update of historical data in the BIAS database. WGBIFS cannot explain remarkable differences between old and new BIAS 0-group sprat abundance values that exist in some years. Based on WGBIFS' sprat abundance data, the tuning indices were calculated by WGBFAS in previous years. The differences are probably caused by the use of different area-correction method.

Herring in SD 25-29, 32 (excl. GOR).
XSA input: Tuning Fleet/International Acoustic Survey (WGBFAS 2008)

Year	Fish. Effort	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8+
1982	1	7398	10609	3863	2219	2178	1690	983	1582
1983	1	3583	5854	5939	2605	1682	1829	1275	2063
1984	1	7522	6769	6841	5413	1871	1150	769	1148
1985	1	3649	8240	4466	3764	1289	593	454	603
1986	1	4065	9199	10088	4589	3206	1020	420	587
1987	1	6945	2677	5692	5914	2237	1305	407	210
1988	1	1537	5210	2531	5638	4725	1912	965	498
1989	1	6046	2840	7835	3202	4812	2815	1147	544
1990	1	11954	10075	6016	5433	3176	2611	1341	1136
1991	1	6217	16515	10197	3782	8184	2119	2006	2156
1992	1	6794	7762	11774	6565	3728	2158	1471	1132
1993**	1	-11	-11	-11	-11	-11	-11	-11	-11
1994	1	3336	9577	18196	11337	5505	2027	906	802
1995	1	4608	3132	6067	7382	6276	3631	1710	902
1996	1	3288	12263	8962	6621	4363	2280	1121	756
1997**	1	-11	-11	-11	-11	-11	-11	-11	-11
1998	1	3645	1748	5600	5984	2530	1522	791	429
1999	1	1663	4218	2521	3794	3593	1417	824	601
2000	1	2744	1475	5089	1837	2722	2181	940	611
2001	1	2870	6600	2901	4504	1555	1260	900	465
2002	1	2275	3509	5545	2511	2267	860	733	450
2003	1	13112	7552	9601	6238	2213	1734	745	1142
2004*	1	5544	14730	7101	4934	2599	1169	638	706
2005*	1	2125	8700	16639	8275	5101	2999	1314	1427
2006*	1	7317	8061	12702	21123	7337	3069	1701	1212
2007***	1	5401	6588	2975	4192	7094	1697	883	808

* WGBFAS 2007: Updated with area corrected values.
** No estimates due incomplete coverage of the standard survey area in these years.
*** Updated with area corrected values.

Relation (new/old)*100

YEAR	HER_TOTAL	HER_AGE1	HER_AGE2	HER_AGE3	HER_AGE4	HER_AGE5	HER_AGE6	HER_AGE7	HER_AGE8
1991		108.4	119.5	112.6	106.5	118.9	118.4	114.4	114.7
1992		109.6	118.7	113.2	110.5	113.1	108.7	108.4	107.2
1993									
1994		118.1	125.2	113.3	103.8	105.4	106.5	106.5	107.0
1995									
1996		121.7	113.5	112.8	112.3	106.1	106.1	108.2	106.2
1997									
1998		118.3	125.8	119.9	111.0	104.8	102.4	103.2	103.3
1999		106.0	113.1	128.2	113.2	104.1	103.1	103.4	107.0
2000		370.6	174.3	195.1	264.3	192.0	149.6	321.5	339.3
2001		141.2	124.9	114.0	104.4	101.8	99.3	96.6	101.7
2002		118.6	122.5	118.7	114.8	105.2	104.1	104.1	104.7
2003		128.6	121.9	113.4	109.3	107.5	104.5	104.4	104.5
2004		89.1	90.9	97.2	96.8	97.7	99.5	96.1	98.3
2005		90.8	95.4	93.4	87.5	87.3	86.8	85.3	81.0
2006		100.4	100.6	100.7	100.8	100.7	100.8	100.6	100.6
2007		100.4	101.1	101.7	102.0	101.6	101.6	101.0	101.0

In 1993, 1995 and 1997 the Baltic International Acoustic Survey (BIAS) did not cover all ICES Subdivisions which are needed for calculation of herring abundance index. Therefore the herring abundance indices from these three years are not usable for tuning purpose. The small differences between old and new BIAS herring abundance indices in years 1991–1996 are caused by the update of historical data in the BIAS database. Larger differences between the old and new BIAS herring abundance indices in some years can be caused by the wrong rectangle references and missing or wrong area-corrections.

WGBIFS tried to find the reason for the enormous difference in the old and new BIAS herring abundance indices in year 2000. In 2001 WGBIFS provided WGBFAS with herring abundance indices by ICES Subdivisions for year 2000. These values agree with the new BIAS herring abundance indices (see the table below). The high herring abundance values occur in year 2000 because of the very large numbers of herring in the northern part of SD 29 (SD 29N). Based on WGBIFS' herring abundance data, WGBFAS calculated the herring stock tuning indices in 2001. It seems that in 2001 has WGBFAS excluded the high herring numbers in SD 29N during the combination of acoustic data from year 2000. Instead of that the lower values from SD 29S were used

and extrapolated for whole area of SD 29. If we restore the tuning fleet calculation in that way (see table below), we will get values, which are close to the old herring abundance indices.

Estimated numbers (millions) of herring October 2000 (WGBIFS 2001)

Area	SD	total	age 0	age 1	age 2	age 3	age 4	age 5	age 6	age 7	age 8+
	21	464	122	329	11	1	0	0			
	22	534	188	298	27	7	7	5	1		
	23	493	60	253	118	36	16	7	3	1	0
	24	2409	848	624	320	305	179	85	37	6	5
	25	3850	147	615	429	945	339	597	434	181	163
	26	4953	644	765	279	933	481	652	701	276	222
	27	1841	1	398	80	509	281	272	226	73	2
	28	3305	283	272	179	946	291	417	459	250	208
	30	27973	98	3636	894	1774	4378	2009	2652	4239	8294
	32	32499	1143	19486	2686	2568	2523	2312	1034	448	298
3583	29N	18002	133	5672	841	3678	2290	1899	793	1584	1113
6571	29S	3142	35	451	343	1189	286	520	220	99	
	Total	99463	3702	32799	6207	12890	11071	8776	6559	7156	10304
10154	total 29		168	6123	1184	4867	2576	2419	1013	1683	1113
(1) total SD25-29 (WGBIFS 2001)			**1243**	**8173**	**2151**	**8200**	**3968**	**4357**	**2833**	**2463**	**1708**
(2) total SD25-29 without area correction (WGBIFS 2010)			**1241**	**8165**	**2150**	**8196**	**3966**	**4356**	**2831**	**2459**	**1704**
(1)/(2)*100	**%**		**99.8**	**99.9**	**100.0**	**100.0**	**99.9**	**100.0**	**99.9**	**99.9**	**99.7**
(3) Old XSA input herring tuning fleet (WGBFAS 2001)				**2744**	**1475**	**5089**	**1837**	**2722**	**2181**	**940**	**611**
Area compensated SD 29 (29S data only)			**54**	**697**	**530**	**1837**	**442**	**804**	**340**	**153**	**0**
(4) Restored herring tunung fleet for SD 25-29			**1129**	**2747**	**1497**	**5170**	**1834**	**2742**	**2160**	**933**	**595**
(4)/(3)*100	**%**			**100.1**	**101.5**	**101.6**	**99.8**	**100.7**	**99.0**	**99.3**	**97.4**

WGBIFS was asked additionally to check the quality of acoustic data in 1982–1990, and to inform WGBFAS whether the formerly not revised years 1982–1990 should be still included in the tuning fleet time-series. As currently there are no acoustic data from the period 1982–1990 in the BAD1 format BIAS database, it is not possible to check or to revise acoustic indices from requested period. Internationally coordinated annual acoustic surveys (BIAS) in the Baltic Sea were initiated in 1991. In 1982–1990 only few countries have performed national acoustic autumn surveys in the Baltic Sea. During this period the acoustic equipment and survey standards were not fully standardized. It is possible, that the acoustic indices in 1982–1990 are not comparable with the revised indices. *Taking into account these facts WGBIFS recommends to exclude the acoustic indices in years 1982–1990 from the tuning fleet time-series.*

WGBIFS recommends that all countries who have performed acoustic surveys in 1982–1990 to send the acoustic data from these surveys to Uwe Böttcher (uwe.boettcher@vti.bund.de) not later than three months before the next WGBIFS meeting in 2011. Once the acoustic data from years 1982–1990 are available in BIAS database, the check of the quality of these data will be performed by WGBIFS.

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Annex 1: List of participants

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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 2009 acoustic surveys and experiments and report to WGBFAS; (ToR a1).
7) Quality assurance and background documentation of acoustic data (additional 4, 5, 6, 7)
8) Update of BAD1 and FishFrame data. (ToR a2).
9) Planning of acoustic surveys in 2nd half of 2010 and 1st half of 2011 (ToR b)
10) Review and update the Baltic International Acoustic Survey (BIAS) manual; (ToR g).
11) Evaluation of the new results of uncertainty estimates of the BIAS abundance indices applying simulation model. (ToR k).
12) Discuss the descriptions and the documentation of various methods for weighting procedures when combining hauls in compilation of acoustic indices. (ToR j).
13) Target strength of less important species – results of literature studies

Bottom trawl surveys and data

14) Discuss the results from BITS surveys performed in autumn 2009 and spring 2010 (ToR c).
15) Result of the comparable hauls between "Solea" and "Havfisken" conducted during BITS 4. q 2009.
16) Review of new results on the vertical distribution of the cod during the BITS. (ToR h).
17) Plan and decide on demersal trawl surveys and experiments to be conducted in autumn 2010 and spring 2011. (ToR d).
18) Review of the upload and development status of DATRAS (ToR i).
    i) Change of the status in H_Val and change in the values accepted (Additional 1)
    ii) Algorithm for calculation of Stat. Rec. based on the position information (suggestion from chair)
19) Modification of bottom-trawl survey standard gear. It is suggested to allow a more wear-resistant material to be used in the codend of the standard trawl (TV3). (Additional 2)
20) Ensure that the data collection is appropriate to studies of biological diversity (Additional 3)

21) Status of the yearly update of the manual on age determination of Baltic flounder (ToR from 2008).

22) Review and update the Baltic International Trawl Survey (BITS) manual. (ToR f).

23) Update and correction of the Tow Database (ToR e).

24) Status of standard survey reports.

Final issues

25) Selection of new chair and next meeting

Annex 3: WGBIFS terms of reference for the next meeting

The **Baltic International Fish Survey Working Group** [WGBIFS] chaired by Henrik Degel, Denmark, will meet in Kaliningrad, Russia from 21–25 March 2011 to:

a) Combine and analyse the results of spring and autumn 2010 acoustic surveys and experiments and report to WGBFAS;

b) Update the hydro acoustic databases BAD1 and FishFrame for the years 1991 to 2010;

c) Plan and decide on acoustic surveys and experiments to be conducted in autumn 2011 and spring 2012;

d) Discuss the results from BITS surveys performed in autumn 2010 and spring 2011;

e) Plan and decide on demersal trawl surveys and experiments to be conducted in autumn 2011 and spring 2012;

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) review of the upload and development status of DATRAS and FishFrame;

k) Discuss the descriptions and the documentation of various methods for weighting procedures when combining hauls in compilation of acoustic indices;

l) Evaluating the new results of uncertainty estimates of the BIAS abundance indices applying simulation model.

m) Review the results of the scrutinizing of the data from the Baltic region uploaded in DATRAS with special reference to the issue of correct species identification and consistency across countries.

WGBIFS will report by 15 May 2011 to the attention of the SCICOM.

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 area. 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.

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	The indices provided by the surveys coordinated by WGBIFS are of significant importance for the drawn up of the biological advice.
Linkages to other committees or groups	The data produced by the surveys coordinated by WGBIFS is a major source for information on Environmental Indicators and therefore important for the Working Group on Ecosystem Effects of Fisheries.
Linkages to other organizations	No direct linkage to other organizations.

Annex 4: Recommendations

RECOMMENDATION	FOR FOLLOW UP BY:
1. WGBIFS recommends that the new dataset can be used in the assessment of the herring stocks in the Baltic Sea with the restriction that the following years are excluded from the index series: 1993, 1995 and 1997. WGBIFS recommends that the new dataset can be used in the assessment of the sprat stock in the Baltic Sea with the restriction that the following years are excluded from the index series: 1993, 1995 and 1997.	WGBFAS
2. WGBIFS recommends that the May/June 2001–2009 BASS index can be applied as additional source of data (fleet) for tuning in the final assessment of the Baltic sprat stock biomass.	WGBFAS
3. The database FishFrame Acoustics with disaggregated data should be put in an operative state in order to make it possible to upload data of the agreed resolution.	DTU Aqua
4. The Table 5.7 in the BIAS manual should be updated for fish species found in the survey area either with internationally agreed target strength parameters or assumed parameters for species or species groups where target strength has not been established. Germany will study fish species in SD 21–4 and Sweden will study fish species in SD 25–0. Until new TS parameters are agreed the following is suggested. Gadoids should be treated as cod. Salmonids and 3-spined stickleback should be treated as herring. Fish without swimbladder should be treated as mackerel. Other fish species should be treated as cod.	WGBFAS, Germany and Sweden.
5. The results of the BITS 4th quarter 2009 and BITS 1st quarter surveys 2010 can be used as basis for calculation of the indices. It is necessary to estimate the mean density of cod within the Russian zone based on the data of the remaining area in quarter 2009.	WGBFAS
6. The results of the "Havfisken" survey (KASU) 4 q 2009 and 1q 2010 can be used as basis for calculation of the indices.	WGBFAS
7. The results of the Danish sole survey 20010 can be used as basis for calculation of the indices.	WGBFAS
8. It is recommended that the definition of the h_validity coding in the DATRAS exchange format is changes in order to accommodate the suggested modifications in the use of the information hold by the variable. The issue should be discussed in WGDIM.	ICES Data Centre and WGDIM
9. It is recommended that all countries should consult it in their national gear experts and based on the circulated document decide on if the suggested changes in the standard gear should be accepted.	All countries which participate in BITS 1st and/or 4th quarter
10. WGBIFS recommends that Latvia do a special study using different weighting methods regarding the trawl hauls. It is suggested that data from 2003 to 2009 in SD 28 for both herring and sprat is used and that the results is presented at the WGBIFS 2011 meeting.	Latvia

RECOMMENDATION	FOR FOLLOW UP BY:
11. Existing datasets from the Baltic International Acoustic Survey (BIAS) should be reworked in order to complete the survey statistics table in BAD1 with percentage of cod. The possibility to create a valid index of cod abundance from BAD1 data in the pelagic water should then be tested. Data from already performed experiments and data collection on pelagic distribution of cod during the BITS should be worked up further in order to enlighten the justification of the BITS assumptions.	WGBIFS
12. RCM Baltic is requested to make guideline how biological flatfish data should be processed when the data collected is too sparse to maintain national expertise.	RCM Baltic
13. The new standard exchange format (Table 6.1) for the next BIAS surveys input data preparation is recommended. Required data on Baltic herring, sprat and cod from forthcoming the BIAS and BASS surveys should be reported to the Baltic International Acoustic Surveys coordinators, i.e. Niklas Larson, Lysekil – Sweden (niklas.larson@fiskeriverket.se) and Uwe Boettcher, Rostock – Germany (uwe.boettcher@vti.bund.de), not later than end of February of the next year.	
14. In 1993, 1995 and 1997 the Baltic International Acoustic Survey (BIAS) did not cover all ICES Subdivisions which are needed for calculation of sprat and herring abundance index. Therefore WGBIFS recommends not using the sprat and herring abundance indices based on BIAS data from these three years for tuning purpose.	WGBFAS
15. As the quality of acoustic data in 1982–1990 is currently uncertain, WGBIFS recommends excluding the acoustic indices in years 1982–1990 from the tuning fleet time-series.	WGBFAS
16. WGBIFS recommends that all countries who have performed acoustic surveys in 1982–1990 to send the acoustic data from these surveys to Uwe Böttcher not later than three months before the next WGBIFS meeting in 2011.	WGBIFS
17. WGBIFS recommends that after the acoustic data from years 1982–1990 are available in the BAD1 format BIAS database the check of the quality of these data are performed.	WGBIFS

Annex 5: Whole time-series for tuning indices

Table 1. Autumn tuning fleet index for Central Baltic Herring in SD 25–29.

YEAR	TOTAL	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
1991	58981	6739	19731	11477	4029	9728	2508	2295	2474
1992	46617	7445	9217	13327	7256	4217	2346	1595	1214
1993	29157	727	4661	7008	8047	3697	2107	1117	1793
1994	58093	3939	11992	20607	11770	5804	2158	965	858
1995	28519	4693	2279	4560	6012	5385	3214	1532	845
1996	44521	4000	13914	10105	7435	4631	2419	1213	803
1997	15770	1452	1561	5314	3318	2214	1118	475	318
1998	25338	4312	2199	6717	6643	2651	1558	816	443
1999	20757	1762	4772	3233	4293	3740	1461	852	643
2000	41109	10168	2571	9931	4855	5226	3262	3022	2073
2001	24482	4053	8242	3308	4704	1583	1251	869	473
2002	20977	2699	4298	6581	2883	2386	895	763	471
2003	49940	16868	9204	10887	6819	2378	1812	778	1193
2004	35018	4942	13388	6905	4774	2539	1163	613	694
2005	42352	1929	8302	15543	7243	4455	2604	1121	1156
2006	62947	7346	8107	12793	21290	7386	3095	1712	1219
2007	30020	5424	6657	3025	4276	7205	1724	892	816
2008	34933	6756	6776	7615	3677	4989	3478	843	798
2009	39243	6429	12300	6958	5658	2107	3026	2138	627

Table 2. Autumn recruitment index for Central Baltic Herring in SD 25–29.

YEAR	AGE 0
1991	41455
1992	40079
1993	2221
1994	55721
1995	36151
1996	3435
1997	39465
1998	705
1999	25177
2000	4026
2001	7045
2002	60147
2003	109134
2004	2432
2005	32051
2006	38371
2007	15915
2008	106076
2009	8276

Table 3. Autumn tuning fleet index for Baltic Sprat in SD 24–29.

YEAR	TOTAL	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
1991	150054	46989	40690	43970	2637	8953	1806	1936	3072
1992	104248	37345	27356	24438	9433	1945	2452	717	563
1993	101924	31432	32078	16755	13164	4754	1005	1520	1215
1994	138642	12557	45137	43656	17478	12051	5149	1034	1579
1995	238711	137383	16894	40591	22762	11648	5789	2194	1451
1996	274611	71379	133914	21098	23648	12968	6493	3770	1341
1997	147144	9431	58497	57746	8766	7888	2659	1717	440
1998	234015	102572	22213	56369	37065	8201	4856	1675	1064
1999	198198	4904	91316	16083	36201	39247	5296	3364	1787
2000	156948	59895	5321	51166	5753	14282	16174	1599	2760
2001	109135	12224	36403	6973	30796	4064	9749	6477	2449
2002	121626	31811	14641	37845	5831	19258	2656	5167	4419
2003	216860	100928	32803	24306	23675	8099	13435	4867	8747
2004	203288	121935	47843	11895	8053	4995	2472	2454	3640
2005	207222	7200	126586	49268	10179	5197	3051	2392	3348
2006	206196	37280	12054	105751	33052	8168	4692	2167	3031
2007	122749	52489	22128	8331	26627	9980	1105	479	1610
2008	129253	29422	45772	20500	5407	19177	5765	1267	1942
2009	147439	78186	25771	21329	6728	4751	7197	2070	1407

Table 4. Autumn recruitment index for sprat in SD 26 + 28 from BIAS.

YEAR	AGE 0
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

Table 5. Spring tuning fleet index for sprat in SD 24, 25, 26 and 28.

YEAR	TOTAL	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
2001	111 233	8 322	36 412	13 010	37 889	5 449	4 804	4 717	630
2002	126 777	27 439	19 133	37 184	19 104	14 974	2 547	3 711	2 685
2003	86 865	27 313	16 662	8 514	15 855	5 668	7 364	1 720	3 769
2004	266 052	139 812	68 118	16 020	11 115	13 050	3 296	8 068	6 572
2005	137 452	4 402	91 314	23 823	7 313	3 593	2 827	1 873	2 308
2006	133 843	13 783	8 242	78 851	21 526	5 847	2 008	1 570	2 016
2007	136 190	53 027	29 438	6 506	36 976	7 692	1 292	540	720
2008	104 881	9 163	41 157	20 519	5 706	21 703	4 320	777	1 538
2009	142 986	40 705	27 209	36 819	10 775	16 870	6 012	3 586	1 009

Table 6. Area corrected numbers (millions) of herring by Sub-division, October, 1991–2009.

YEAR	SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
1991	22	4 786	4 507	235	32	6	5	0	0	0	0
1991	23	488	98	53	122	125	48	32	8	2	0
1991	24	6 623	1 595	2 765	915	905	261	91	52	5	33
1991	25	4 303	566	852	760	969	459	341	113	108	136
1991	26	14 107	4 744	1 586	1 926	1 558	582	1 588	553	729	842
1991	27	6 966	14	490	2 494	1 602	495	1 244	134	232	261

YEAR	SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
1991	28	16 525	2 091	1 125	4 819	2 009	1 462	3 121	671	608	619
1991	29	30 918	6 424	2 686	9 733	5 338	1 031	3 434	1 036	618	617
1992	22	1 715	1 140	510	50	10	4	0	1	0	0
1992	23	670	88	218	203	77	56	17	5	4	1
1992	24	6 310	2 740	1 853	992	450	207	49	17	0	2
1992	25	8 267	125	1 455	1 252	2 173	1 966	763	282	161	89
1992	26	10 589	1 037	2 334	1 594	2 378	1 483	701	474	343	244
1992	27	7 620	17	1 486	1 956	2 526	927	434	194	57	22
1992	28	11 233	1	513	1 092	2 699	1 799	1 966	1 313	1 002	847
1992	29	10 517	427	1 656	3 322	3 551	1 081	353	83	32	12
1993	21	658	321	167	85	48	25	6	5	1	0
1993	22	663	372	153	88	42	7	0	0	0	0
1993	23	109	8	5	15	40	15	14	8	3	2
1993	24	2 174	506	238	306	479	425	126	51	29	14
1993	26	16 665	1 234	421	2 467	3 425	4 148	2 290	1 167	619	894
1993	28	13 794	67	306	2 194	3 583	3 899	1 407	940	499	899
1994	21	1 616	1 519	10	68	18	0	0	0	0	0
1994	22	2 386	2 218	60	74	16	13	2	2	3	0
1994	23	459	116	36	57	91	74	44	28	11	2
1994	24	5 034	2 613	383	840	533	438	177	38	12	0
1994	25	9 786	1 083	682	924	3 097	2 454	1 016	307	166	57
1994	26	9 700	653	842	954	2 286	2 299	1 430	629	344	263
1994	27	11 790	2 728	824	2 257	3 904	1 520	434	106	13	4
1994	28	17 266	391	258	1 994	5 475	4 385	2 727	1 067	438	530
1994	29	15 695	1 288	1 333	5 862	5 844	1 112	197	49	5	5
1995	21	1 708	1 034	594	22	32	11	6	0	9	0
1995	22	2 796	2 246	374	52	30	45	26	22	0	0
1995	23	677	276	85	56	74	74	39	31	25	18
1995	24	4 351	2 194	933	251	298	295	239	104	25	12
1995	25	6 116	652	913	474	754	1 210	1 009	761	276	67
1995	26	8 200	529	1 083	393	978	1 722	1 539	1 134	517	305
1995	27	7 052	151	2 169	634	1 102	1 204	1 066	293	241	192
1995	28	8 508	26	527	778	1 726	1 877	1 770	1 026	497	280
1996	21	859	404	404	46	5	0	0	0	0	0
1996	22	908	429	388	28	28	28	6	1	0	0
1996	23	617	102	118	201	86	40	39	20	8	3
1996	24	3 119	1 118	594	356	349	245	286	109	43	18
1996	25	7 244	28	389	1 642	1 573	1 629	1 096	560	240	86
1996	26	5 198	277	535	894	747	860	723	630	297	236
1996	27	12 152	0	1 405	4 508	2 970	2 323	798	109	35	4

YEAR	SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
1996	28	10 401	0	263	2 750	2 086	1 342	1 775	1 083	624	478
1996	29	9 863	31	1 408	4 121	2 728	1 281	239	37	17	0
1997	21	1 129	194	623	272	39	2	0	0	0	0
1997	22	1 313	725	531	49	2	1	2	1	2	1
1997	23	780	113	94	135	172	102	62	51	18	33
1997	24	4 071	2 279	924	406	233	71	67	59	17	17
1997	25	7 571	3 024	882	466	1 538	886	435	175	98	67
1997	26	6 180	937	502	792	1 401	967	755	460	231	136
1997	28	6 075	95	68	304	2 376	1 466	1 024	483	145	115
1998	21	699	77	440	146	33	2	1	0	0	0
1998	22	720	507	180	21	6	5	0	0	0	0
1998	23	961	239	50	288	191	121	36	17	11	8
1998	24	2 762	1 815	241	252	192	126	66	51	16	3
1998	25	4 583	375	838	508	1 062	1 104	448	163	64	20
1998	26	3 734	119	461	162	470	926	513	597	286	201
1998	27	6 013	11	1 607	535	1 879	1 470	324	163	22	2
1998	28	7 487	3	482	505	1 807	2 203	1 202	622	445	219
1998	29	4 030	0	923	489	1 500	941	163	14	0	0
1999	21	3 524	3 377	134	11	0	2	0	0	0	0
1999	22	2 845	2 299	498	32	9	1	2	3	0	0
1999	23	783	350	165	70	113	59	22	2	1	1
1999	24	4 467	1 776	949	698	163	221	655	3	0	1
1999	25	6 555	1 032	755	1 284	977	1 171	825	280	160	71
1999	26	4 625	593	529	705	386	548	855	433	270	306
1999	27	2 865	12	253	848	310	887	459	75	12	10
1999	28	4 582	168	149	551	715	747	1 082	599	344	227
1999	29	4 729	795	76	1 384	846	940	518	75	66	28
1999	30	2 068	100	188	561	252	228	253	141	156	189
1999	31	41	6	1	4	5	8	9	3	3	3
1999	32	1 529	203	42	387	535	217	76	31	18	20
2000	21	591	156	419	14	2	0	0	0	0	0
2000	22	507	175	284	28	8	7	5	1	0	0
2000	23	542	61	253	123	52	32	13	7	2	1
2000	24	2 209	767	568	297	284	167	81	35	5	5
2000	25	4 071	156	650	454	999	359	631	459	191	172
2000	26	5 012	651	774	282	945	487	660	709	279	225
2000	27	2 201	1	475	96	608	335	325	270	88	2
2000	28	3 642	310	300	198	1 043	321	460	506	275	229
2000	29	27 520	218	7 968	1 542	6 337	3 353	3 150	1 318	2 189	1 445
2000	30	28 770	104	3 846	929	1 794	4 430	2 049	2 704	4 361	8 553
2000	32	43 654	1 522	26 174	3 615	3 452	3 392	3 108	1 388	603	400
2001	21	5 130	5 072	45	12	1	0	0	0	0	0
2001	22	727	601	80	23	7	8	4	4	0	0
2001	23	2 500	355	520	1 048	449	118	11	0	0	0

YEAR	SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
2001	24	4 906	1 264	1 019	1 260	848	339	104	63	6	1
2001	25	5 881	323	596	1 615	821	1 387	424	327	308	81
2001	26	4 215	841	414	683	415	796	304	277	294	190
2001	27	6 036	109	1 674	2 411	623	846	231	87	49	7
2001	28	3 298	17	440	860	399	784	276	235	134	153
2001	29	7 176	833	929	2 673	1 050	891	347	325	85	42
2001	32	686	26	72	259	190	77	31	14	11	6
2002	22	2 146	1 835	258	21	19	10	0	1	0	0
2002	23	554	89	172	133	98	44	10	4	2	1
2002	24	3 219	1 772	214	251	538	340	64	22	2	14
2002	25	3 005	581	451	310	814	426	294	81	33	16
2002	26	4 072	464	585	334	905	405	634	299	284	161
2002	27	5 059	1 127	510	963	1 402	607	329	61	54	5
2002	28	6 826	1 331	223	1 018	1 318	743	1 070	450	389	284
2002	29	18 134	12 616	930	1 673	2 141	702	59	4	3	5
2003	21	990	330	617	43	1	0	0	0	0	0
2003	22	1 089	975	102	6	5	1	0	0	0	0
2003	23	770	272	95	66	117	151	49	15	4	2
2003	24	4 409	3 067	698	188	119	189	73	59	5	11
2003	25	9 453	2 642	1 192	1 571	1 483	1 471	514	434	82	64
2003	26	5 990	631	768	808	902	1 076	454	616	272	463
2003	27	10 778	1 278	3 590	2 366	2 120	1 178	157	87	0	1
2003	28	14 582	541	2 963	1 595	4 387	2 337	1 062	622	415	660
2003	29	18 233	4 004	8 356	2 864	1 994	758	191	53	9	5
2003	32	19 516	1 309	10 798	3 367	1 995	988	594	344	7	115
2004	21	212	92	93	22	2	2	2	0	0	0
2004	22	1 114	896	143	58	7	7	2	2	0	0
2004	23	998	83	293	247	138	81	74	59	14	9
2004	24	3 640	2 291	553	329	246	96	85	24	12	4
2004	25	7 638	889	765	1 920	1 594	1 164	856	166	136	148
2004	26	4 516	657	255	620	723	715	648	333	279	288
2004	27	7 888	0	1 391	4 160	1 449	615	198	54	15	5
2004	28	9 012	27	504	2 863	2 099	1 828	705	562	178	246
2004	29	7 552	15	2 026	3 825	1 040	452	132	49	6	7
2004	32	1 207	13	357	594	172	63	8	0	0	0
2005	21	842	677	104	50	10	2	0	0	0	0
2005	22	798	672	99	20	5	2	1	0	0	0
2005	23	1 007	283	94	244	153	93	57	51	20	12
2005	24	3 667	2 395	509	333	238	96	48	39	6	5
2005	25	5 796	693	479	643	1 776	804	755	402	134	111
2005	26	5 525	571	435	438	949	749	981	593	312	496
2005	27	7 100	215	338	2 075	3 294	763	211	145	35	24
2005	28	11 179	500	153	931	3 570	2 156	1 789	1 148	449	483

YEAR	SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
2005	29	18 348	3 617	524	4 216	5 953	2 771	719	316	191	41
2005	32	21 503	1 421	218	2 682	7 990	7 859	847	440	0	46
2006	21	1 520	1 124	260	73	48	11	2	1	0	0
2006	22	1 646	1 543	99	2	2	1	0	0	0	0
2006	23	1 123	385	82	50	156	163	119	80	61	26
2006	24	3 032	1 827	555	153	174	180	62	51	25	5
2006	25	9 268	408	757	707	1 692	3 111	1 000	624	690	280
2006	26	9 764	374	842	529	1 964	3 567	977	780	338	393
2006	27	7 954	26	1 651	1 007	1 702	2 484	740	214	72	59
2006	28	7 831	24	533	857	1 668	3 050	890	478	196	135
2006	29	30 121	1 159	3 563	5 007	5 768	9 078	3 780	999	415	352
2006	32	12 775	857	2 991	2 325	3 653	2 057	757	93	18	22
2007	21	575	311	234	25	4	2	0	0	0	0
2007	22	807	803	4	0	0	0	0	0	0	0
2007	23	604	246	118	115	44	40	27	5	3	6
2007	24	2 638	1 699	396	183	120	112	73	23	26	6
2007	25	4 306	337	454	564	449	727	1 101	291	223	160
2007	26	4 509	398	411	451	391	727	1 090	413	298	330
2007	27	5 105	1 712	984	1 076	193	367	607	92	56	18
2007	28	7 152	186	422	1 262	906	1 529	2 031	491	162	163
2007	29	21 156	9 575	3 152	3 304	1 086	926	2 377	437	152	146
2007	30	24 252	443	5 671	4 916	1 846	1 508	5 254	1 441	826	2 348
2007	32	9 401	1 386	2 107	2 186	233	331	3 019	63	42	35
2008	21	1 126	997	114	13	2	0	0	0	0	0
2008	22	605	576	28	1	0	0	0	0	0	0
2008	23	364	199	54	24	30	20	22	11	2	4
2008	24	2 498	1 306	278	210	209	156	170	105	47	18
2008	25	4 730	405	515	567	781	338	978	797	209	140
2008	26	5 265	539	358	569	665	530	870	996	318	419
2008	27	9 368	1 080	2 754	1 897	1 523	591	1 034	433	23	35
2008	28	6 486	535	600	1 050	1 361	908	905	776	237	114
2008	29	17 793	6 150	2 529	2 693	3 285	1 311	1 203	476	56	90
2008	30	22 896	859	2 670	4 846	3 386	1 649	1 825	3 344	1 266	3 049
2008	32	9 120	2 075	1 201	1 065	1 734	1 000	291	1 153	296	305
2009	21	716	666	49	0	0	0	0	0	0	0
2009	22	766	741	18	2	1	3	0	0	0	0
2009	23	488	390	54	21	11	6	3	2	1	0
2009	24	2 279	1 420	269	203	144	95	57	56	27	7
2009	25	3 970	384	206	757	861	680	239	446	328	69
2009	26	4 627	909	207	812	618	608	298	554	395	226
2009	27	8 312	30	818	3 406	1 458	1 284	363	589	326	37
2009	28	10	66	362	2 860	2 493	1 919	872	1 013	880	238

YEAR	SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
		704									
2009	29	14 999	1 980	4 836	4 465	1 528	1 167	334	423	208	57
2009	30	27 514	679	3 573	5 090	5 559	2 438	1 283	1 518	3 616	3 757
2009	32	12 460	96	3 214	5 446	918	1 532	319	110	788	38

Table 7. Area corrected numbers (millions) of sprat by Subdivision, October, 1991–2009.

YEAR	SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
1991	22	6596	6332	233	12	9	1	4	0	0	6
1991	23	0	0	0	0	0	0	0	0	0	0
1991	24	13359	2225	4860	3191	1955	613	375	15	36	88
1991	25	20653	2879	2494	3405	7680	691	1733	417	468	886
1991	26	63369	21820	24090	8524	6823	182	1302	136	142	350
1991	27	8381	117	319	2354	3087	248	730	210	505	811
1991	28	45780	15497	10194	9550	7945	203	1706	225	116	342
1991	29	51131	10344	4799	13654	16471	700	3101	803	671	588
1992	22	2092	1419	127	331	170	31	13	1	0	0
1992	23	197	61	20	30	58	19	5	3	0	1
1992	24	9449	3437	2019	2244	1429	267	43	8	3	0
1992	25	13303	316	1983	3734	4070	1874	455	528	216	126
1992	26	78018	33931	16664	11984	9083	3965	690	1360	122	220
1992	27	3382	5	206	1043	1038	386	187	187	194	137
1992	28	42302	9327	15086	7015	7356	2673	460	281	54	49
1992	29	4021	19	1239	976	1234	219	91	85	128	29
1993	21	5	5	0	0	0	0	0	0	0	0
1993	22	837	361	98	179	141	45	7	7	0	0
1993	23	4	0	0	1	2	0	0	0	0	0
1993	24	1811	59	201	617	761	152	17	4	0	0
1993	26	42432	3908	16090	9847	4815	4274	2012	703	291	492
1993	28	62063	896	15043	21434	11037	8692	2718	292	1228	723
1994	21	1614	313	1012	283	6	0	0	0	0	0
1994	22	1629	746	136	183	279	207	59	15	4	0
1994	23	70	61	2	2	3	1	0	0	0	0
1994	24	3956	1702	131	181	946	817	143	36	0	0
1994	25	22932	9131	348	2480	4888	3047	1765	1010	152	110
1994	26	83807	33312	11138	23749	9877	3331	1549	696	11	143
1994	27	21678	7514	60	1072	5681	2555	2649	982	475	690
1994	28	30704	6314	465	9914	6885	3720	2283	676	97	348
1994	29	38308	5661	278	7554	15097	3799	3602	1734	296	287
1995	21	806	16	277	352	126	34	2	0	0	0
1995	22	2993	1815	742	222	40	75	66	14	8	11
1995	23	258	51	88	57	16	25	12	6	2	0
1995	24	11334	3762	3706	2059	364	796	339	217	69	22

YEAR	SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
1995	25	25299	7276	8289	1531	3493	2695	1561	245	123	86
1995	26	68784	22322	29879	3104	7264	3617	1575	745	172	107
1995	27	38601	3158	19081	2290	6076	4464	2473	538	198	323
1995	28	136157	6332	75599	7632	23338	11090	5621	4025	1621	901
1996	21	5	0	0	1	2	0	2	0	0	0
1996	22	549	8	103	80	170	109	68	3	7	2
1996	23	149	1	19	33	66	15	5	9	2	0
1996	24	6056	210	1923	1371	1380	515	313	269	32	43
1996	25	25655	0	3778	10477	3197	3913	2158	1254	663	214
1996	26	65896	3033	25761	21186	8159	4745	1843	605	507	57
1996	27	46027	83	10170	26093	1023	2956	2991	1545	896	270
1996	28	101902	359	24981	56905	5428	7341	3430	1581	1326	552
1996	29	32239	168	4644	17769	1676	4054	2161	1227	338	202
1997	21	15	0	1	3	7	4	1	0	0	0
1997	22	396	127	34	69	107	53	6	0	0	0
1997	23	197	109	6	25	29	17	10	1	0	0
1997	24	14580	5242	2757	2516	2884	738	307	136	0	0
1997	25	27889	293	1316	9323	10688	4214	1587	422	45	0
1997	26	70873	26619	2583	22985	13755	2754	1278	616	266	18
1997	28	79952	14353	2735	23579	30283	990	4699	1484	1406	423
1998	21	46	2	9	5	14	11	2	0	4	0
1998	22	1355	415	406	162	252	96	20	1	0	2
1998	23	131	0	47	23	39	19	3	0	0	0
1998	24	4168	131	1821	598	981	474	137	23	3	0
1998	25	16509	15	5970	1089	4630	3434	697	436	215	22
1998	26	57157	670	41072	3895	6732	3241	1021	332	118	75
1998	27	46923	0	8649	7142	14670	11581	2930	1594	357	0
1998	28	77371	22	35303	4287	17079	13955	2619	2198	945	965
1998	29	31680	27	9304	5017	11985	4265	773	273	37	0
1999	21	271	0	237	30	2	2	0	0	0	0
1999	22	455	147	82	91	95	37	2	1	0	0
1999	23	522	426	21	33	26	12	2	2	0	0
1999	24	8405	6654	449	701	410	134	38	19	0	0
1999	25	12442	1044	165	5622	1229	1908	1659	474	203	140
1999	26	46593	11044	3423	22959	3739	2625	1846	410	242	305
1999	27	40660	392	248	12974	4635	8665	11018	1773	559	396
1999	28	58458	12491	496	23278	2114	8916	7727	1215	1343	877
1999	29	64550	1689	18	25658	3835	13904	16955	1403	1018	69
1999	30	252	1	11	16	8	204	0	2	10	0
1999	31	0	0	0	0	0	0	0	0	0	0
1999	32	4111	1033	9	1632	664	419	244	44	50	16
2000	21	8	1	3	2	1	1	0	0	0	0
2000	22	435	187	77	79	42	43	7	0	0	0
2000	23	19	2	6	4	4	2	1	0	0	0
2000	24	1481	156	641	164	283	143	79	13	1	0
2000	25	4628	67	1363	145	1723	186	513	413	86	134

YEAR	SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
2000	26	47316	2051	27390	3996	9856	1034	1669	849	179	294
2000	27	17940	70	2733	110	5966	1528	2761	4232	309	230
2000	28	67442	1586	21504	642	27626	1385	6305	6120	804	1470
2000	29	22376	572	6180	181	5665	1432	2948	4547	219	632
2000	30	4538	0	166	0	444	359	353	3068	35	113
2000	32	27980	2161	13592	3326	3453	2376	2665	147	185	75
2001	21	1222	9	1158	52	2	1	0	0	0	0
2001	22	1684	1465	57	71	54	24	9	4	0	0
2001	23	335	190	60	23	26	23	3	5	3	3
2001	24	6363	3065	423	1228	809	582	126	94	24	12
2001	25	8432	296	279	2265	783	2604	476	656	685	389
2001	26	34451	5742	4002	8754	2033	8651	1089	2265	1371	543
2001	27	17144	112	2160	4907	587	5037	745	2024	1257	316
2001	28	33733	787	3177	12931	815	10095	634	2594	1936	765
2001	29	19037	388	2065	6225	1866	3781	982	2107	1201	421
2001	32	5848	157	942	2429	839	519	277	570	111	5
2002	22	1242	923	196	59	29	20	13	2	0	0
2002	23	64	14	25	8	14	2	1	0	0	0
2002	24	6274	3502	1769	315	331	146	132	56	7	18
2002	25	6288	1364	1880	981	951	690	264	62	53	43
2002	26	37776	14018	12380	1955	4978	725	2804	168	518	230
2002	27	11717	1482	942	2482	3737	846	1098	301	534	294
2002	28	68873	19222	10866	4078	19517	1760	9437	319	2341	1333
2002	29	70008	40091	3753	4763	8287	1643	5509	1747	1713	2502
2003	21	59	11	6	24	17	1	1	0	0	0
2003	22	12251	12053	10	7	87	57	20	18	0	0
2003	23	169	73	7	26	32	21	7	0	1	0
2003	24	5505	3382	818	701	396	151	20	12	21	4
2003	25	15277	3985	2357	3474	2025	1681	614	810	281	49
2003	26	86505	39302	25077	8890	2587	5212	988	2782	458	1208
2003	27	42854	13630	6472	4568	5635	5220	1874	2593	1711	1152
2003	28	91006	24584	32469	9630	4887	8596	1501	4895	649	3795
2003	29	110991	50689	33717	5507	8658	2738	3075	2324	1745	2538
2003	32	48557	22346	17621	3495	1575	956	2026	142	246	149
2004	21	1619	1335	180	54	38	11	1	1	0	0
2004	22	2276	376	1628	186	70	12	2	0	2	0
2004	23	106	1	69	15	12	7	2	0	0	0
2004	24	4885	546	3559	424	175	126	24	19	5	5
2004	25	17573	26	8654	3145	1735	1882	609	713	249	561
2004	26	35444	1682	19243	8097	3146	723	1501	255	482	313
2004	27	27307	1	13064	8584	1251	2038	343	905	288	832
2004	28	71354	441	43988	14732	4629	2243	2153	401	1180	1587
2004	29	47929	513	31729	12661	877	1022	360	179	247	341
2004	32	62574	111	50848	11093	342	90	12	68	3	8
2005	21	1872	13	1525	274	46	9	6	0	0	0
2005	22	1983	1042	25	563	344	8	0	0	0	0

YEAR	SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
2005	23	208	18	44	98	33	8	5	0	1	0
2005	24	5387	3285	301	1276	303	147	43	0	0	33
2005	25	4077	126	103	2000	902	383	290	125	65	83
2005	26	26502	7135	1300	9462	5051	2416	730	179	129	101
2005	27	49936	660	481	28821	13547	1963	1296	1121	742	1305
2005	28	55562	11957	2122	25952	9823	2595	1474	735	495	410
2005	29	106094	18303	2824	58416	19267	2659	1360	891	960	1416
2005	32	59373	1112	5510	40699	10864	608	355	0	0	225
2006	21	415	23	78	224	80	10	0	0	0	0
2006	22	3229	2490	98	80	502	54	3	0	2	0
2006	23	433	368	27	16	17	4	1	0	0	0
2006	24	22808	19205	1423	623	1132	326	74	25	0	0
2006	25	4363	553	554	310	1824	586	223	210	76	26
2006	26	42866	6032	10015	2210	16215	5051	1970	551	500	322
2006	27	18514	4740	1214	802	7165	2923	409	454	298	509
2006	28	102977	19769	13514	5069	44406	11555	4172	1960	1018	1514
2006	29	78227	14064	10437	2944	34489	12553	1315	1491	274	660
2006	32	146572	20305	46588	12401	44198	19602	2205	561	168	543
2007	21	755	18	512	77	123	22	5	0	0	0
2007	22	591	118	342	32	69	27	4	0	0	0
2007	23	201	10	131	38	17	4	1	0	0	0
2007	24	7156	683	4903	747	662	127	33	3	0	0
2007	25	5651	66	2793	661	155	1179	548	68	44	137
2007	26	13868	3256	4881	2747	1016	1479	241	128	65	55
2007	27	10967	1589	3319	1925	271	2420	989	123	88	244
2007	28	36406	242	10850	8343	2816	9479	3239	697	150	590
2007	29	65743	11869	25271	7636	3325	11913	4925	88	131	585
2007	30	7069	2	1114	163	84	1735	2697	150	109	1014
2007	32	70497	3240	23725	17826	3913	14174	6070	450	298	801
2008	21	156	144	3	7	1	1	0	0	0	0
2008	22	780	694	13	48	9	11	5	0	0	0
2008	23	108	23	6	35	27	12	5	0	0	0
2008	24	5045	2382	480	1218	582	272	90	11	11	0
2008	25	5111	723	323	2181	757	144	727	146	41	69
2008	26	31786	15345	4317	5509	4112	630	1370	363	84	56
2008	27	22160	8324	1010	6469	1916	207	2470	1203	365	196
2008	28	80347	40856	11139	11804	6602	1029	6446	1569	456	445
2008	29	101878	49614	12135	18509	6494	3103	8064	2473	310	1175
2008	30	6470	1	196	621	147	80	2429	1967	197	831
2008	32	69661	16274	14795	17374	5399	1563	9654	3272	142	1188
2009	21	109	41	40	15	11	1	0	0	0	0
2009	22	1323	1307	6	3	3	1	3	0	0	0
2009	23	255	21	39	55	98	25	14	2	0	0
2009	24	4443	3041	654	372	316	23	29	3	1	3
2009	25	7650	249	3655	1006	1541	627	268	243	55	6
2009	26	19996	5428	9733	2880	1020	485	101	285	47	17

YEAR	SD	TOTAL	AGE 0	AGE 1	AGE 2	AGE 3	AGE 4	AGE 5	AGE 6	AGE 7	AGE 8+
2009	27	9413	29	4293	1159	1831	755	329	646	304	66
2009	28	42525	1070	15221	7903	8817	3258	1508	3131	1054	562
2009	29	74691	1713	44584	12392	7703	1553	2499	2886	608	753
2009	30	2369	7	446	130	122	112	29	477	769	276
2009	32	118403	1730	56910	24493	18507	3388	4443	6041	2091	800