

4 Flounder

In the Baltic Sea there are several distinct flounder stocks (populations). The migrations between the mature flounder stocks are limited. Details can be found in Appendix 7.

On average about 50%, 20% and 15% of the flounder landings are reported respectively from Subdivisions 24 + 25, 26 and 22. The total landings fluctuated between 8 400 t and 24400 t (Table 4.1, Figure 4.2.1). The highest landings were recorded in 2002, 2005 and 2007. During the mid-1990s flounder landings were misreported, mainly for Subdivisions 24 and 25.

The landings in 2010 were about 16600 t for all Subdivisions in total.

This means an increase of about 950 t from 2009.

In the northern Baltic, especially in Sweden and Finland, the recreational fishery becomes more and more important. In these countries, the flatfish catch in the recreational fishery equilibrates or even exceeds the commercial catch.

During WGBFAS 2007, an experimental length based SURBA stock assessment was tried for flounder in Subdivisions 24 (see report WGBFAS 2007. It was not updated in 2008.

In 2010 a workshop on flounder assessment in the Baltic (WKFLABA, ICES, 2011) was held in Oregrund, Sweden. Reviewing and discussing the above cited literature, the workshop resulted in the following flounder stock identifications:

Based on egg buoyancy, WKFLABA proposes two spawning groups of flounder in the Baltic: Shallow water spawners with the eggs developing in contact to the bottom and deep water spawners with eggs developing free floating in the water column.

Additional information from tagging, genetics, fecundity studies suggest 5 stocks of deep water spawners in the Baltic. Three are in line with that identified for dab and plaice, i.e SD 22, SD 23 and SD 24 + SD 25. Additionally, there are two separate stocks, one in the Gdansk (SD 26) and one in the eastern Gotland basin (mainly in SD28E but also stretching into SD 26 and 29). Approximate locations of the deep water spawning stocks are shown in Figure 4.1. These stocks contribute by about 80-90% to the Baltic landings.

For the shallow water spawning flounder, WKFLABA suggests 6 stocks (Fig 4.2.):

1. one along the Swedish coast in SD 27,
2. one around the Gotland Island (SD 27 and SD 28 West) and
3. one in Irbe Strait, including western part of Gulf of Riga and up to Hiiumaa island in Estonia (SD 28 East),
4. one in SD29and SD 30
5. two in SD 32:
 - a. one along the Finnish coast (SD 32 North)
 - b. one along the Estonian coast. (SD 32 South)

There is some uncertainty on shallow water spawning flounder occurring in SD 25 (Otterlind 1967) and SD 26 (Florin & Höglund 2008) due to the salinity there is in favour of deep water spawning.

Age reading of flounder still is not consistent between countries. For example, the average length of 6 year old flounder (mean age in landings) in one and the same

Subdivision varies from 23 to 32 cm in 2009. This may illustrate the differences in age reading and expertise level of age readers. According to the flounder age reading workshop (WKARFLO), WKFLABA confirmed to use only improved ageing methodology (sliced or broken and burned as an alternative).

WKFLABA found indications that staging of maturity could be a potential problem in further stock assessment. Due to different maturity staging results there are problems with determination of spawning stock size.

WKFLABA recommended to WGBFAS:

1. not to perform classical age based stock assessments for flatfish stocks in Baltic Sea in WGBFAS 2011
2. to use biological populations in future assessment if possible.

The landings from the Subdivisions 22, 24, 25, 26, 27, 28, 29, and 32 were sampled and landing numbers and weights at age data were submitted.

4.1 Flounder in Subdivision 22

4.1.1 Landings

The total landing amounted to about 950 t in 2010, a decrease of about 100t compared to the previous year.

4.1.2 Age composition

Landing number and weight at age data were available from Germany.

4.2 Flounder in Subdivisions 24 and 25

4.2.1 The fishery

4.2.1.1 Catch trends

The landings increased from about 10600 t in 2009 to about 11700t in 2010.

The total landings of the stock fluctuated between about 4 300 t and 13000 t (Table 4.1, Table 4.2. and Figure 4.2.1). Some landings in the mid-1990s are misreported (over-reported) from the cod fishery. Peaks in total landings occurred in 2002 and 2005 and 2007. In 2003 the landing dropped to 8 500 t. This decrease compared to 2002 is partly due to the longer summer ban for cod trawl fishery and partly due to German trawlers did not target flounder in 2003. In 2004 the flounder landings increased again and reached about 10700 t. The Danish landings are mainly by-catch in the cod fishery. Germany in Subdivision 24 (by trawl) and Poland in Subdivision 25 (mainly by gill-net) have flounder directed fisheries.

Further information is given in the Appendix 7.

4.2.1.2 Unallocated landings

Unallocated landings were not reported.

4.2.1.3 Discards

Discard data were not available for all fleets, but preliminary analyses of Swedish by-catch and discard data (Gårdmark and Florin 2006) shows that the amount discarded in the demersal trawling for cod is very high and variable. Estimated discarded

amounts of flounder are five to ten times greater than the amounts of landed by-catches of flounder in the cod trawl fishery.

As identified by the Workshop on alternative assessment strategies for flounder in the Baltic, WKAFAB (Gårdmark *et al.* 2007), discard estimates must be provided from all countries and included into any assessment based on catch data.

Discard sampling for flounder in the cod fishery has been initiated, but the discard patterns are so heterogeneous between the fleets, vessels and even individual hauls of the same vessel and trip that a common raising procedure cannot yet be applied.

4.2.1.4 Effort and CPUE data

No data were available.

4.2.2 Biological composition of the commercial catch derived from age data

4.2.2.1 Age composition from age determination

For 2010 commercial landing numbers at age data are available from Sweden, Latvia, Poland and Germany.

The catches in numbers at age from the Polish and German BITS surveys are given in tables 4.2.1.1 to 4.2.1.3.

4.2.2.2 Quality of catch data

The sampling effort is given in Table 4.2.2.

Because of the major age determination problems in flounder, especially from whole otoliths (see ICES 2007a), WGBFAS decided in 2006 that age data from whole otoliths shall not be used for assessment (ICES 2006a; see also Gårdmark *et al.* 2007).

Furthermore, due to the possible large importance of discards (see section 4.2.1.3) there cannot be any assessment based on catch data before discards have been estimated.

To avoid both discard and age reading problems and following the recommendations of WKAFAB (Gårdmark *et al.* 2007) the 2007 assessment was based on length data from surveys (using SURBA). Moreover, large differences in growth for female and male flounder (Gårdmark and Florin 2007) suggest a separate assessment (see recommendations in Gårdmark *et al.* 2007).

For 2008, however, ACOM has decided that no assessment is to be made for flounder because of the data deficiencies.

In May 2008, the second Workshop on Age Reading of Baltic Flounder (WKARFLO) was held in Rostock, Germany. The Terms of Reference of this workshop comprised also the development of a strategy to overcome the age determination problems. After slicing and staining a representative number of otoliths, a reference collection of otolith slices with agreed ages will form the basis for the re-determination of historic otoliths.

In 2010, on the WKFLABA workshop (ICES, 2011) a tentative assessment for flounder in SD24 and 25 was done on the basis of age reading on whole otoliths and the tuning fleets from the Polish and German BITS surveys (see 4.2.3).

4.2.3 Stock assessment

In 2007, an exploratory length based SURBA was done for female flounder from German BITS surveys in SD 24 quarter 1 where the longest time series was available (ICES, 2007c)

For 2008 ACOM has decided that no exploratory assessment is to be made because of the data deficiencies.

However, exploratory assessments using length based SURBA can still be useful for the flounder stock component in SD 24-25 (for details, see ICES 2007c). Preferably, future exploratory assessments should rely on length-decomposed (by sex) catch data, until long enough (>10 yrs) time series of catch data with reliable age determinations have been compiled. After having solved the age determination problems, the age based SURBA is promising to become a regular alternative to catch based assessments, at least as long as reliable discard estimates are not available.

In 2010 the trial stock assessment was performed during the WKFLABA (ICES, 2011) workshop. First, the XSA was applied and age structured data were extended to cover most recent years (2006-2009). The age reading was based on whole otoliths. The preliminary analysis of the input data showed similarly poor age data consistency as in former assessments for both commercial and survey data. The XSA diagnostic showed low correlation between survey and XSA estimates of stock size. The diagnostic was somewhat better when shrinkage parameter was released. In addition, the difference model (to large extent age independent) was fitted, showing biomass trends moderately similar to XSA estimates with released shrinkage.

The first tests of age data consistency, when aging is performed using thin sectioning, are promising, but more aging with this method and data analysis must be performed, until stronger conclusions on usefulness of such aging for assessment may be reached.

4.2.4 Historical stock trends

An exploratory SURBA for SD 24 female flounder was presented in 2007 (ICES, 2007c).

In 2010, on the WKFLABA workshop (ICES, 2011) a tentative assessment for flounder in SD24 and 25 was done on the basis of age reading of whole otoliths and the tuning fleets from the Polish and German BITS surveys (see 4.2.3).

4.2.5 Quality of assessment

An exploratory SURBA for SD 24 female flounder was presented in 2007(ICES, 2007c).

In 2010, on the WKFLABA workshop (ICES, 2011) a tentative assessment for flounder in SD 24 and 25 was done on the basis of age reading of whole otoliths and the tuning fleets from the Polish and German BITS surveys (see 4.2.3).

4.2.6 Comparison with previous assessment

The exploratory assessment in 2007 is not compared with the assessment in previous years, since in 2006 there was no analytical assessment, and in 2005 it was based on age determinations using whole otoliths (see ICES 2006a, and 2007a for comments on this). Furthermore, the SURBA assessment could be made for SD 24 flounder, only.

In 2010, on the WKFLABA workshop (ICES, 2011) a tentative assessment for flounder in SD24 and 25 was done on the basis of age reading of whole otoliths and the tuning fleets from the Polish and German BITS surveys (see 4.2.3).

4.3 Flounder in Subdivision 26

4.3.1 Landings

In 2010 the total landing of about 3200 t equalled to that of the previous year. The main fishing countries in this area are Russia, Poland and Lithuania. In the previous years the Polish fishery was mainly a gillnet fishery along the coast whereas the Russian and Lithuanian landings were by-catches mainly in a bottom trawl mix-fishery. Total landings in Subdivision 26 increased since 1999.

4.3.2 Catch at age in number and mean weight at age

Poland, Russia and Lithuania supplied number at age and weight at age data in the landings.

4.4 Flounder in Subdivision 27

4.4.1 Landings

In 2010 the total landing of about 40t equalled that of the previous year. The main landings come from a Swedish gillnet fishery.

4.4.2 Catch at age in number and mean weight at age

Sweden supplied number at age and weight at age data in the landings.

4.5 Flounder in Subdivision 28

4.5.1 Landings

The total landings amounted in 2010 to about 390 t, a decrease compared to the 440 t in 2009. The Latvian landings decreased to about 220 t, mainly taken as by-catch in the bottom trawl mix-fishery

4.5.2 Catch at age in number and mean weight at age

Estonia and Latvia supplied landing number and weight at age data by quarter.

4.6 Flounder in Subdivisions 29 and 30

4.6.1 Landings

In Subdivision 29, the flounder fishery is carried out by Estonia, Finland and Sweden. About 90t were landed from SD 29. The landings from the Subdivision 29 show a steady decline since 1999.

For Subdivision 30 virtually no landings were reported.

The procedure for estimating the proportion of recreational landings relative to commercial landings has been revised in 2002. This revision is based on the results of an angler survey in Finland in 2002. This survey showed that approximately 80 % of the Finnish landings from Subdivisions 29 and 30 are from non-commercial (i.e. recreational angling) catches. This proportion has been applied since 2002.

4.6.2 Catch at age in numbers and mean weight at age

Estonia supplied landing number and weight at age data by quarter for Subdivision 29.

4.7 Flounder in Subdivision 32

4.7.1 Landings

The flounder fishery in this area is carried out by Finland and Estonia.

The total landings of 120t in 2010 remained at the level of 2009 (105t).

4.7.2 Catch at age in numbers and mean weight at age

Landing number and mean weight at age data by quarter were provided by Estonia.

Table 4.1a Flounder in the Baltic Sea.
Total landings (tons) 1973-1980 by Subdivision and country.

Year	Country*	SD 22	SD 23	SD 24	SD 25	SD 26	SD 27	SD 28	SD 29	SD 30	SD 31	SD 32	Total
1973	Denmark	1.983		386									2.369
	Finland												0
	Gem. Dem. Rep.	181		1.624	1.516								3.321
	Gem. Fed. Rep.	349		4									353
	Poland				1.580	2.070							3.650
	Sweden				502								502
	USSR							2.610					2.610
Total		2.513	0	2.014	3.598	2.070	0	2.610	0	0	0	0	12.805
1974	Denmark	2.097		2.578									4.675
	Finland												0
	Gem. Dem. Rep.	165		1.482	654								2.301
	Gem. Fed. Rep.	304		3									307
	Poland				1.635	2.473							4.108
	Sweden				470								470
	USSR							2.510					2.510
Total		2.566	0	4.063	2.759	2.473	0	2.510	0	0	0	0	14.371
1975	Denmark	1.992		1.678									3.670
	Finland								113	22		47	182
	Gem. Dem. Rep.	163		1.469	406								2.038
	Gem. Fed. Rep.	469		1									470
	Poland				1.871	2.585							4.456
	Sweden				400								400
	USSR							6.455					6.455
Total		2.624	0	3.148	2.677	2.585	0	6.455	113	22	0	47	17.671
1976	Denmark	2.038		482									2.520
	Finland								118	23		59	200
	Gem. Dem. Rep.	174		1.556	901								2.631
	Gem. Fed. Rep.	392		2									394
	Poland				1.549	2.289							3.838
	Sweden				400								400
	USSR					471		1.779	409			359	3.018
Total		2.604	0	2.040	2.850	2.760	0	1.779	527	23	0	418	13.001
1977	Denmark	1.974		389									2.363
	Finland								115	32		56	203
	Gem. Dem. Rep.	555		2.708	1.096								4.359
	Gem. Fed. Rep.	393		4									397
	Poland				2.071	2.089							4.160
	Sweden				416								416
	USSR					210		1.081	321			414	2.026
Total		2.922	0	3.101	3.583	2.299	0	1.081	436	32	0	470	13.924
1978	Denmark	2.965		415									3.380
	Finland								174	61		155	390
	Gem. Dem. Rep.	348		2.572									2.920
	Gem. Fed. Rep.	477		1									478
	Poland				996	2.106							3.102
	Sweden				346								346
	USSR					288		1.290	334			395	2.307
Total		3.790	0	2.988	1.342	2.394	0	1.290	508	61	0	550	12.923
1979	Denmark	2.451		405									2.856
	Finland								192	54		153	399
	Gem. Dem. Rep.	189		2.509									2.698
	Gem. Fed. Rep.	259		3									262
	Poland				1.230	1.860							3.090
	Sweden				315								315
	USSR					158		1.170	330			1.012	2.670
Total		2.899	0	2.917	1.545	2.018	0	1.170	522	54	0	1.165	12.290
1980	Denmark	2.185		286									2.471
	Finland								194	69		165	428
	Gem. Dem. Rep.	138		2.775									2.913
	Gem. Fed. Rep.	212		1									213
	Poland				1.613	1.380							2.993
	Sweden				16	46		20	181	32			295
	USSR					93		798	334			1.080	2.305
Total		2.535	0	3.078	1.659	1.473	20	979	560	69	0	1.245	11.618

* Denmark: Catches of SD 23 are included in SD 22 & catches of SDs 28&29 are included in SD 27
Sweden: Catches of SDs 24-29 of the years 1973-1979 are included in SD 25
Finland: Catches of SDs 27&28 are included in SD 29 & catches of SD 31 are included in SD 30
Gem. Dem. Rep. Catches of SD 26 are included in SD 25
Gem. Fed. Rep. Catches of SD 25 are included in SD 24
Poland Catches of SD 24 are included in SD 25

Table 4.1b Flounder in the Baltic Sea.
Total landings (tons) 1981-1988 by Subdivision and country.

Year	Country*	SD 22	SD 23	SD 24	SD 25	SD 26	SD 27	SD 28	SD 29	SD 30	SD 31	SD 32	Total
1981	Denmark	1.964		548									2.512
	Finland								227	56		135	418
	Gem. Dem. Rep.	271		2.595									2.866
	Gem. Fed. Rep.	351		1									352
	Poland				1.151	1.541							2.692
	Sweden			21	30		21	194	34				300
	USSR						58	742	445			1.078	2.323
Total		2.586	0	3.165	1.181	1.599	21	936	706	56	0	1.213	11.463
1982	Denmark	1.563	104	257									1.924
	Finland								219	58		144	421
	Gem. Dem. Rep.	263		3.202									3.465
	Gem. Fed. Rep.	248		1									249
	Poland				2.484	1.623							4.107
	Sweden			22	33		65	16	3				139
	USSR						195	665	615			1.121	2.596
Total		2.074	104	3.482	2.517	1.818	65	681	837	58	0	1.265	12.901
1983	Denmark	1.714	115	450									2.279
	Finland								181	67		120	368
	Gem. Dem. Rep.	280		3.572									3.852
	Gem. Fed. Rep.	418		1									419
	Poland				1.828	905							2.733
	Sweden			72	108		212	52	9				453
	USSR						209	551	497			1.114	2.371
Total		2.412	115	4.095	1.936	1.114	212	603	687	67	0	1.234	12.475
1984	Denmark	1.733	85	306									2.124
	Finland								174	108		135	417
	Gem. Dem. Rep.	349		2.719									3.068
	Gem. Fed. Rep.	371		1									372
	Poland				2.471	1.288							3.759
	Sweden			18	27		53	13	2				113
	USSR						145	202	286			1.226	1.859
Total		2.453	85	3.044	2.498	1.433	53	215	462	108	0	1.361	11.712
1985	Denmark	1.561	130	649									2.340
	Finland								157	97		137	391
	Gem. Dem. Rep.	236		3.253									3.489
	Gem. Fed. Rep.	199		4									203
	Poland				2.063	1.302							3.365
	Sweden			16	24		47	12	2				101
	USSR						268	189	265			806	1.528
Total		1.996	130	3.922	2.087	1.570	47	201	424	97	0	943	11.417
1986	Denmark	1.525	65	1.558									3.148
	Finland								199	128		181	508
	Gem. Dem. Rep.	127		2.838									2.965
	Gem. Fed. Rep.	125		10									135
	Poland				3.030	1.784							4.814
	Sweden			20	31		60	15	3				129
	USSR						442	159	281			556	1.438
Total		1.777	65	4.426	3.061	2.226	60	174	483	128	0	737	13.137
1987	Denmark	1.208	122	1.007									2.337
	Finland								159	106		143	408
	Gem. Dem. Rep.	71		2.096									2.167
	Gem. Fed. Rep.	114		11									125
	Poland				2.530	1.745							4.275
	Sweden			17	26		51	13	2				109
	USSR						1.315	203	279			397	2.194
Total		1.393	122	3.131	2.556	3.060	51	216	440	106	0	540	11.615
1988	Denmark	1.162	125	990									2.277
	Finland								177	118		159	454
	Gem. Dem. Rep.	92		2.981									3.073
	Gem. Fed. Rep.	133		5									138
	Poland				1.728	1.292							3.020
	Sweden			23	35		68	17	3				146
	USSR						578	439	257			331	1.605
Total		1.387	125	3.999	1.763	1.870	68	456	437	118	0	490	10.713

* Denmark: Catches 1981 of SD 23 are included in SD 22 & catches of SDs 28&29 are included in SD 27
 Finland: Catches of SDs 27&28 are included in SD 29 & catches of SD 31 are included in SD 30
 Gem. Dem. Rep. Catches of SD 26 are included in SD 25
 Gem. Fed. Rep. Catches of SD 25 are included in SD 24
 Poland Catches of SD 24 are included in SD 25

Table 4.1c Flounder in the Baltic Sea.
Total landings (tons) 1989-1995 by Subdivision and country.

Year	Country*	SD 22	SD 23	SD 24	SD 25	SD 26	SD 27	SD 28	SD 29	SD 30	SD 31	SD 32	Total
1989	Denmark	1.321	83	1.062									2.466
	Finland								175	122		163	460
	Gem. Dem. Rep.	126		3.616									3.742
	Gem. Fed. Rep.	122		2									124
	Poland				1.896	1.089							2.985
	Sweden			22	34		66	16	3				141
	USSR					783		512	214				214
Total		1.569	83	4.702	1.930	1.872	66	528	392	122	0	377	11.641
1990	Denmark	941		1.389									2.330
	Finland								219	81		161	461
	Gem. Dem. Rep.	52		1.622									1.674
	Gem. Fed. Rep.	183		10									193
	Poland				1.617	599							2.216
	Sweden				120								120
	USSR					752		390	144				141
Total		1.176	0	3.021	1.737	1.351	0	390	363	81	0	302	8.421
1991	Denmark	925		1.497									2.422
	Finland								236	81		167	484
	Germany	246		1.814									2.060
	Poland				2.008	1.905							3.913
	Sweden			24	31		88	20					163
	Estonia					49		1	135			51	236
	Latvia					123		323					446
	Lithuania					125							125
	Russia					216		10					226
	Total		1.171	0	3.335	2.039	2.418	88	354	371	81	0	218
1992	Denmark	713	185	975									1.873
	Finland								405	40		627	1.072
	Germany	227		1.972									2.199
	Poland				1.877	1.869							3.746
	Sweden			41	88	3	86	11	3				232
	Estonia							47	47			46	140
	Latvia					26		664					690
	Lithuania					399							399
	Russia					146							146
	Total		940	185	2.988	1.965	2.443	86	722	455	40	0	673
1993	Denmark	649	194	635									1.478
	Finland								438	57		683	1.178
	Germany	235		1.230									1.465
	Poland				3.276	1.229							4.505
	Sweden		26	27	63	1	83	10					210
	Estonia							52	86			55	193
	Latvia					99		389					488
	Lithuania					155							155
	Russia					225							225
	Total		884	220	1.892	3.339	1.709	83	451	524	57	0	738
1994	Denmark	882	181	1.016									2.079
	Finland								445	33		87	565
	Germany	44		4.262		2		3					4.311
	Poland				3.177	1.266							4.443
	Sweden		84	20	18	37	33	55	10				257
	Estonia								3			4	7
	Latvia					31		276					307
	Lithuania					218							218
	Russia					167							167
	Total		926	265	5.298	3.195	1.721	33	334	458	33	0	91
1995	Denmark	859	231	2.110									3.200
	Finland								398	28		131	557
	Germany	286		2.825		4		40					3.155
	Poland				7.437	1.482							8.919
	Sweden		58	28	186	7	81	18					378
	Estonia				8			16	52			35	111
	Latvia					39		322					361
	Lithuania				8	187							195
	Russia					271							271
	Total		1.145	289	4.963	7.639	1.990	81	396	450	28	0	166

* Finland: Catches of SDs 27&28 are included in SD 29 & catches of SD 31 are included in SD 30
Denmark: Catches of SDs 28&29 are included in SD 27
Gem. Dem. Rep. Catches of SD 26 are included in SD 25
Gem. Fed. Rep. Catches of SD 25 are included in SD 24
Germany Catches of SD 25 are included in SD 24
Poland/Latvia Catches of SD 24 are included in SD 25

Table 4.1d Flounder in the Baltic Sea.
Total landings (tons) 1996-2001 by Subdivision and country.

Year	Country*	SD 22	SD 23	SD 24	SD 25	SD 26	SD 27	SD 28	SD 29	SD 30	SD 31	SD 32	Total
1996	Denmark	1.041	227	2.306									3.574
	Finland				1							271	715
	Germany	189		1.322		10		9	365	78			1.530
	Poland				6.069	2.556							8.625
	Sweden	2	58	101	718	48	114	31				145	1.072
	Estonia							44	99				288
	Latvia					74		215					289
	Lithuania					316							316
	Russia					740							740
Total		1.232	285	3.729	6.788	3.744	114	299	464	78	0	416	17.149
1997	Denmark	1.356		2.421	31	10							3.818
	Finland				1				283	69		299	652
	Germany	655		1.982		12		4					2.653
	Poland				3.877	1.730							5.607
	Sweden		42	62	308	31	105	370					918
	Estonia				15			101	96			125	337
	Latvia					78		284					362
	Lithuania					554							554
	Russia					1.001							1.001
Total		2.011	42	4.465	4.232	3.416	105	759	379	69	0	424	15.902
1998	Denmark	1.372		2.393									3.765
	Finland				4				284	59		297	644
	Germany	411		1.729		2							2.142
	Poland				4.215	1.370							5.585
	Sweden		61	49	187	18	70	117					502
	Estonia				10			146	79			87	322
	Latvia				2	88		274					364
	Lithuania					737							737
	Russia					1.188							1.188
Total		1.783	61	4.171	4.418	3.403	70	537	363	59	0	384	15.249
1999	Denmark	1.473		1.206									2.679
	Finland				1				286	57		276	620
	Germany	510		1.825									2.335
	Poland				4.015	1.435							5.450
	Sweden		37	24	87	47	15						210
	Estonia				8			92	150			164	414
	Latvia					140		365					505
	Lithuania					547							547
	Russia					964							964
Total		1.983	37	3.055	4.111	3.133	15	457	436	57	0	440	13.724
2000	Denmark	1.896		1.757									3.653
	Finland			15	6				276	43		275	615
	Germany	660		2.089									2.749
	Poland				3.423	1.668							5.091
	Sweden		41	49	122	0	73	28					313
	Estonia				2	1		65	150			126	344
	Latvia				3	113		302					418
	Lithuania					575							575
	Russia					1.236							1.236
Total		2.556	41	3.910	3.556	3.593	73	395	426	43	0	401	14.994
2001	Denmark	2.030		3.048									5.078
	Finland			9	69				224	28		267	597
	Germany	458		1.886									2.344
	Poland				4.608	1.433							6.041
	Sweden		52	31	96	3	90	178			3		453
	Estonia							100	161			221	482
	Latvia					201		412					613
	Lithuania					1.127							1.127
	Russia					1.355							1.355
Total		2.488	52	4.974	4.773	4.119	90	690	385	28	3	488	18.090

* Finland: Catches of SDs 27&28 are included in SD 29 & catches of SD 31 are included in SD 30
 Poland/Latvia Catches of SD 24 are included in SD 25
 Germany Catches of SD 25 are included in SD 24

Table 4.1e **Flounder in the Baltic Sea.**
Total landings (tons) 2002-2007 by Subdivision and country.

Year	Country*	SD 22	SD 23	SD 24	SD 25	SD 26	SD 27	SD 28	SD 29	SD 30	SD 31	SD 32	Total
2002	Denmark	1.490		2.883	2								4.375
	Finland			9	69				109	77		21	285
	Germany	317		2.066									2.383
	Poland				6.979	1.512							8.491
	Sweden		42	30	111	4	90	48		5			330
	Estonia							91	199			226	516
	Latvia					221		375					596
	Lithuania					1.077							1.077
	Russia					1.314							1.314
	Total	1.807	42	4.988	7.161	4.128	90	514	308	82	0	247	19.367
2003	Denmark	1.063		1.786	1	1							2.851
	Finland			2	7				103	69		22	203
	Germany	241		1.490									1.731
	Poland				5.068	1.425							6.493
	Sweden		33	45	105		57	17					257
	Estonia							122	192			128	442
	Latvia					281		392					673
	Lithuania					1.066							1.066
	Russia					1.402							1.402
	Total	1.304	33	3.323	5.181	4.175	57	531	295	69	0	150	15.118
2004	Denmark	952		2.615									3.567
	Finland				1				85	65		24	175
	Germany	315		1.591									1.906
	Poland				6.364	1.900							8.264
	Sweden		31	19	86		45	18					199
	Estonia							89	144			167	400
	Latvia				7	169		600					776
	Lithuania					834							834
	Russia					1.277							1.277
	Total	1.267	31	4.225	6.458	4.180	45	707	229	65	0	191	17.398
2005	Denmark	725	184	2.159	144								3.212
	Finland								59	40	0	13	112
	Germany	94		883	43								1.020
	Poland			2.072	6.762	1.714							10.548
	Sweden	+	38	26	58	+	47	124	2	+			296
	Estonia							133	144			114	391
	Latvia			2		383		1.333					1.718
	Lithuania					949							949
	Russia					1.393							1.393
	Total	819	223	5.142	7.007	4.439	47	1.590	206	40	0	127	19.639
2006	Denmark	620	182	517	1.517	4							2.840
	Finland			2	2				12	4	1	2	23
	Germany	34		974	7								1.015
	Poland			1.779	5.950	1.681							9.410
	Sweden		30	23	61	1	33	20					168
	Estonia							83	165			129	377
	Latvia					317		838					1.155
	Lithuania					355							355
	Russia					1.231							1.231
	Total	654	212	3.295	7.537	3.589	33	941	177	4	1	131	16.574
2007	Denmark	585	233	623	622	2							2.065
	Finland			2	8	1			5	1	0	2	19
	Germany	406		1.432	217	0							2.055
	Poland			3.016	5.837	1.836							10.690
	Sweden		26	27	59	1	39	18	0	0	0		171
	Estonia							92	125			111	328
	Latvia			8	7	166		877					1.058
	Lithuania				11	268							279
	Russia					2.650							2.650
	Total	991	259	5.109	6.761	4.925	39	987	130	1	0	113	19.315

* Finland: Where not given separately, catches of SDs 27&28 are included in SD 29 and catches of SD 31 are included in SD 30

Poland/Latvia Where not given separately, catches of SD 24 are included in SD 25

Germany Where not given separately, catches of SD 25 are included in SD 24

** provisional

Table 4.1f Flounder in the Baltic Sea.
Total landings (tons) 2008 - 2010 by Subdivision and country.

Year	Country	SD 22	SD 23	SD 24	SD 25	SD 26	SD 27	SD 28	SD 29	SD 30	SD 31	SD 32	Total
2008	Denmark	554	199	427	313								1.492
	Finland				0				5	1	0	3	9
	Germany	627		1.608	238								2.473
	Poland*			2.094	5.569	1.456							9.119
	Sweden	0	47	29	66	0	47	18	0	0			207
	Estonia							91	125			103	319
	Latvia			44	29	203		374					651
	Lithuania				31	601		27					660
	Russia					1.960							1.960
Total		1.180	246	4.202	6.247	4.221	47	511	130	1	0	105	16.891
2009	Denmark	505	113	326	199								1.142
	Finland			44	0				6	1	0	4	56
	Germany	521		1.181	29	1							1.731
	Poland			2.540	5.985	1.671							10.195
	Sweden		37	27	65	0	43	17	0	0			189
	Estonia				0			79	119			121	319
	Latvia				154	52		312					518
	Lithuania				31	472		27					530
	Russia					969							969
Total		1.026	149	4.118	6.464	3.164	43	435	124	1	0	125	15.650
2010**	Denmark	557	91	332	385	0							1.364
	Finland			14	2		0		5	0	0	2	23
	Germany	376		957	31								1.364
	Poland			2.173	7.665	1.731							11.569
	Sweden	0	29	21	64	0	36	15	0	0			165
	Estonia							93	94			117	305
	Latvia				31	25		225					281
	Lithuania				19	407		55					481
	Russia					1.030							1.030
Total		933	120	3.497	8.196	3.193	36	388	100	0	0	119	16.582

* Poland 2008 corrected

** provisional

Table 4.2.1 Flounder in SD 24-25 Landings by Subdivision

Year	SD 22	SD 23	SD 24	SD 25	SD 26	SD 27	SD 28	SD 29	SD 30	SD 31	SD 32	Total	Except 24-25
1975	2.624	0	3.148	2.677	2.585	0	6.455	113	22	0	47	17.671	11.846
1976	2.604	0	2.040	2.850	2.760	0	1.779	527	23	0	418	13.001	8.111
1977	2.922	0	3.101	3.583	2.299	0	1.081	436	32	0	470	13.924	7.240
1978	3.790	0	2.988	1.342	2.394	0	1.290	508	61	0	550	12.923	8.593
1979	2.899	0	2.917	1.545	2.018	0	1.170	522	54	0	1.165	12.290	7.828
1980	2.535	0	3.078	1.659	1.473	20	979	560	69	0	1.245	11.618	6.881
1981	2.586	0	3.165	1.181	1.599	21	936	706	56	0	1.213	11.463	7.117
1982	2.074	104	3.482	2.517	1.818	65	681	837	58	0	1.265	12.901	6.902
1983	2.412	115	4.095	1.936	1.114	212	603	687	67	0	1.234	12.475	6.444
1984	2.453	85	3.044	2.498	1.433	53	215	462	108	0	1.361	11.712	6.170
1985	1.996	130	3.922	2.087	1.570	47	201	424	97	0	943	11.417	5.408
1986	1.777	65	4.426	3.061	2.226	60	174	483	128	0	737	13.137	5.650
1987	1.393	122	3.131	2.556	3.060	51	216	440	106	0	540	11.615	5.928
1988	1.387	125	3.999	1.763	1.870	68	456	437	118	0	490	10.713	4.951
1989	1.569	83	4.702	1.930	1.872	66	528	392	122	0	377	11.641	5.009
1990	1.176	0	3.021	1.737	1.351	0	390	363	81	0	302	8.421	3.663
1991	1.171	0	3.335	2.039	2.418	88	354	371	81	0	218	10.075	4.701
1992	940	185	2.988	1.965	2.443	86	722	455	40	0	673	10.497	5.544
1993	884	220	1.892	3.339	1.709	83	451	524	57	0	738	9.897	4.666
1994	926	265	5.298	3.195	1.721	33	334	458	33	0	91	12.354	3.861
1995	1.145	289	4.963	7.639	1.990	81	396	450	28	0	166	17.147	4.545
1996	1.232	285	3.729	6.788	3.744	114	299	464	78	0	416	17.149	6.632
1997	2.011	42	4.465	4.232	3.416	105	759	379	69	0	424	15.902	7.205
1998	1.783	61	4.171	4.418	3.403	70	537	363	59	0	384	15.249	6.660
1999	1.983	37	3.055	4.111	3.133	15	457	436	57	0	440	13.724	6.558
2000	2.556	41	3.910	3.556	3.593	73	395	426	43	0	401	14.994	7.528
2001	2.488	52	4.974	4.773	4.119	90	690	385	28	3	488	18.090	8.343
2002	1.807	42	4.988	7.161	4.128	90	514	308	82	0	247	19.367	7.218
2003	1.304	33	3.323	5.181	4.175	57	531	295	69	0	150	15.118	6.614
2004	1.267	31	4.225	6.458	4.180	45	707	229	65	0	191	17.398	6.715
2005	819	223	5.142	7.007	4.439	47	1.590	206	40	0	127	19.640	7.491
2006	654	212	3.295	7.537	3.589	33	941	177	4	1	131	16.574	5.741
2007	992	258	5.109	6.761	4.925	39	987	130	1	0	113	19.315	7.445
2008	1.180	246	4.202	6.247	4.221	47	511	130	1	0	105	16.891	6.441
2009	1.026	149	4.118	6.464	3.164	43	435	124	1	0	125	15.650	5.068
2010	933	120	3.497	8.196	3.193	36	388	100	0	0	119	16.582	4.888
Total	63.297	3.620	134.938	141.990	99.144	1.938	29.152	14.307	2.039	4	18.104	491.952	226.717

Table 4.2.1.1 Flounder in SD 24 and 25: catches per hour at age (weighted mean by areas of the depth strata,40-, 60-,80-) of the Polish bottom trawl survey in SD 25 in the 1st quarter. Gear: P20/25, in 2001 TV3 930 meshes.

Year	Catch in number							
	Total	AG 2	AG 3	AG 4	AG 5	AG 6	AG 7	AG 8+
1993	99,1	0,0	15,4	25,4	53,1	4,5	0,5	0,2
1994	105,4	3,5	26,9	35,6	20,7	17,2	1,1	0,6
1995	166,5	0,0	4,1	69,3	44,6	29,1	13,4	6,0
1996	21,5	0,0	5,0	5,4	6,3	3,0	1,3	0,4
1997	102,5	8,2	35,2	43,0	9,1	3,7	2,2	1,1
1998	125,3	0,0	21,5	38,5	40,6	15,0	6,7	3,1
1999	204,4	1,0	74,9	77,8	27,9	14,4	2,5	5,9
2000	77,3	0,1	14,5	34,0	16,4	8,2	2,4	1,7
2001	199,3	0,5	46,7	81,0	51,1	13,5	5,3	1,2
2002	217,4	0,2	38,1	81,6	67,6	11,2	14,4	4,4
2003	80,4	0,0	17,3	33,8	17,8	5,8	3,1	2,6
2004	453,9	0,0	28,7	237,7	135,8	41,2	6,9	3,6
2005	851,3	1,5	178,3	298,7	251,9	100,8	9,2	10,8
2006	689,9	0,0	219,5	263,3	131,0	53,9	15,8	6,5
2007	1.405,0	0,0	4,7	555,6	590,5	200,8	52,7	0,6
2008	394,4	0,0	8,5	56,2	112,6	121,1	72,2	23,7
2009	273,5	5,4	23,5	138,2	57,5	38,0	7,8	3,1
2010	84,9	15,2	43,9	15,0	8,7	1,8	0,2	0,0

Table 4.2.1.2. Flounder in SD 24 and 25: catches per half an hour (mean of the strata means 30-39m and 40-49m weighted by stratum areas) of the German bottom trawl surveys in ICES SD 24 in November/December. Gear: HG20/25, in 2001 TV3 520 meshes

Year	Catch in number							
	Total	AG 2	AG 3	AG 4	AG 5	AG 6	AG 7	AG 8+
1983	16,7	0,3	1,1	6,3	4,6	2,5	1,5	0,4
1984	20,1	1,1	3,1	8,8	4,2	1,9	0,5	0,5
1985	42,1	0,4	13,4	14,2	8,7	3,0	0,2	2,1
1986	16,5	0,0	1,2	8,7	3,7	1,3	0,9	0,7
1987	30,7	4,7	12,4	8,3	3,4	0,7	0,7	0,5
1988	12,0	0,2	8,0	2,7	0,5	0,2	0,2	0,2
1989	21,1	1,0	6,4	8,8	3,3	0,9	0,5	0,0
1990	213,0	28,3	78,8	52,2	37,5	10,4	4,3	1,5
1991	44,0	2,2	11,1	19,4	7,1	2,7	0,7	0,8
1992	34,5	3,4	20,1	7,9	2,0	0,7	0,3	0,0
1993	59,4	5,3	33,0	12,8	6,7	0,9	0,4	0,3
1994	37,3	1,3	17,3	11,5	5,0	1,4	0,7	0,2
1995	21,0	1,4	7,0	5,5	3,4	1,8	1,0	0,9
1996	19,6	0,6	4,4	5,3	3,6	1,9	1,4	1,9
1997	22,9	3,3	10,9	4,9	2,0	1,0	0,5	0,3
1998	23,1	1,1	11,9	6,6	2,5	0,4	0,3	0,3
1999	57,1	1,4	29,5	19,0	4,8	1,1	0,7	0,6
2000	23,7	0,8	10,6	7,9	2,8	0,6	0,4	0,6
2001	42,4	1,4	25,2	10,1	3,2	1,4	0,5	0,6
2002	77,4	1,4	47,5	19,9	3,8	1,8	1,2	1,2
2003	20,6	1,4	8,2	7,7	1,8	0,5	0,2	0,2
2004	46,6	3,1	28,1	8,8	3,3	1,3	0,4	0,2
2005	21,8	3,5	10,1	4,9	2,4	0,6	0,3	0,2
2006	85,9	5,0	24,8	43,9	9,6	1,7	0,6	0,3
2007	37,0	1,3	13,9	11,0	8,9	1,4	0,3	0,2
2008	83,1	11,8	48,8	15,9	5,0	1,2	0,4	0,0
2009	109,9	15,7	65,1	19,6	5,2	3,0	0,6	0,7
2010	156,0	52,6	71,2	16,3	6,8	5,6	2,3	1,1

Table 4.2.1.3 Flounder in SD 24 and 25: catches per half an hour (mean of the strata means 30-39m and 40-49m weighted by stratum areas) of the German bottom trawl surveys in ICES SD 24 in February. Gear: HG20/25, in 2001 TV3 520 meshes.

Year	Catch in number							
	Total	AG 2	AG 3	AG 4	AG 5	AG 6	AG 7	AG 8+
1992	90,9	0,2	14,2	37,4	24,1	9,4	3,4	2,2
1993	80,4	4,3	38,9	24,9	10,4	1,3	0,5	0,1
1994	58,1	1,6	28,9	17,2	7,0	2,2	0,7	0,5
1995	89,0	5,0	36,5	27,8	13,2	3,8	2,2	0,5
1996	35,0	3,9	13,1	8,3	5,9	2,1	1,0	0,7
1997	36,5	4,1	16,0	10,4	4,0	1,1	0,5	0,4
1998	50,9	3,9	31,0	11,3	3,0	0,7	0,5	0,6
1999	36,4	3,1	25,8	6,1	1,2	0,1	0,1	
2000	124,6	10,7	69,7	31,9	9,6	1,8	0,5	0,3
2001	36,0	10,4	15,8	7,1	1,2	0,4	0,3	0,3
2002	92,2	10,3	67,8	9,6	2,1	0,7	0,5	1,2
2003	57,9	10,1	31,9	12,7	1,7	0,6	0,4	0,4
2004	37,9	10,5	22,4	3,3	0,6	0,1	0,1	0,2
2005	44,9	3,6	16,6	19,6	3,7	1,0	0,3	0,1
2006	59,0	3,1	22,8	23,7	7,8	1,4	0,2	0,0
2007	85,9	5,0	24,8	43,9	9,6	1,7	0,6	0,3
2008	76,0	3,5	35,0	17,8	11,2	4,9	2,5	1,1
2009	39,4	0,8	6,4	13,8	8,9	4,9	2,8	1,8
2010	58,2	3,8	30,0	17,0	3,9	1,5	1,5	0,6
2011**								

** not yet submitted

Table. 4.2.2. Flounder in SD 24- 25 Samples of commercial catches by quarter and Sub-division for 2010 available to the Working Group.

Sub-division	Country	Quarter	Landings	Number of samples	Number of fish measured	Number of fish aged
24	DEU	1	97	2	5	
		2	135	27	5036	1071
		3	293	27	5353	678
		4	432	23	4947	1021
		total	957	79	15341	2770
	POL	1	32	1	114	34
		2	276	8	418	60
		3	1601	1	100	33
		4	265	35	2525	199
		total	2173	45	3157	326
	total		3130	124	18498	3096
	25	DEU	1	19	24	4535
2			4	27	3794	324
3						
4			8	12	778	144
total		31	63	9107	979	
LAT		1	31	6	816	75
		2				
		3				
		4				
total		31	6	816	75	
POL		1	3624	31	4291	124
		2	1303	27	1911	63
	3	1252	6	534	135	
	4	1486	6	391	155	
	total	7665	70	7127	477	
SWE	1	22	1	200	200	
	2	10				
	3	18				
	4	14	1	200	200	
total	64	2	400	400		
total		7791	141	17450	1931	
total		10921	265	35948	5027	

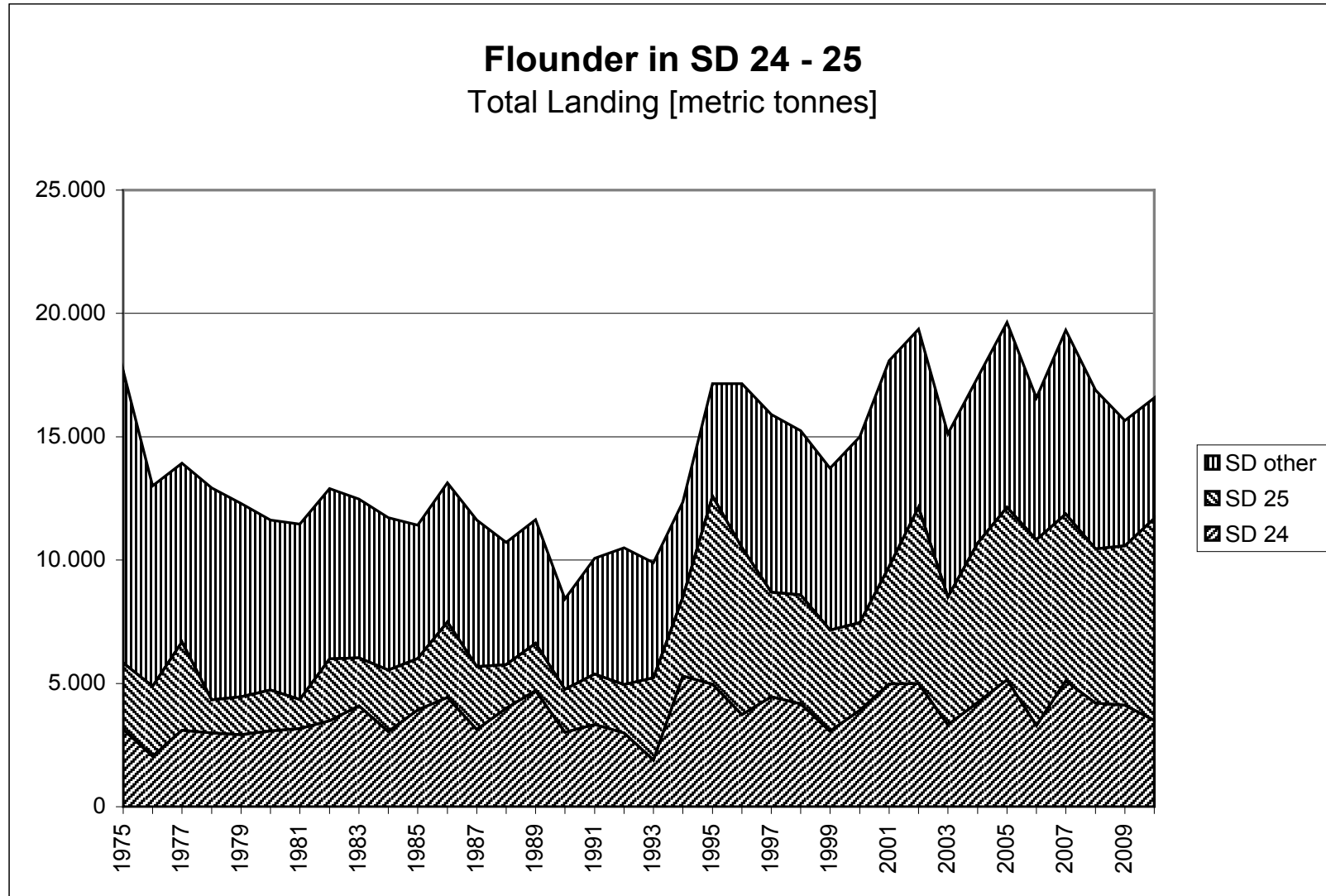


Figure 4.2.1 Flounder landings by sub-division

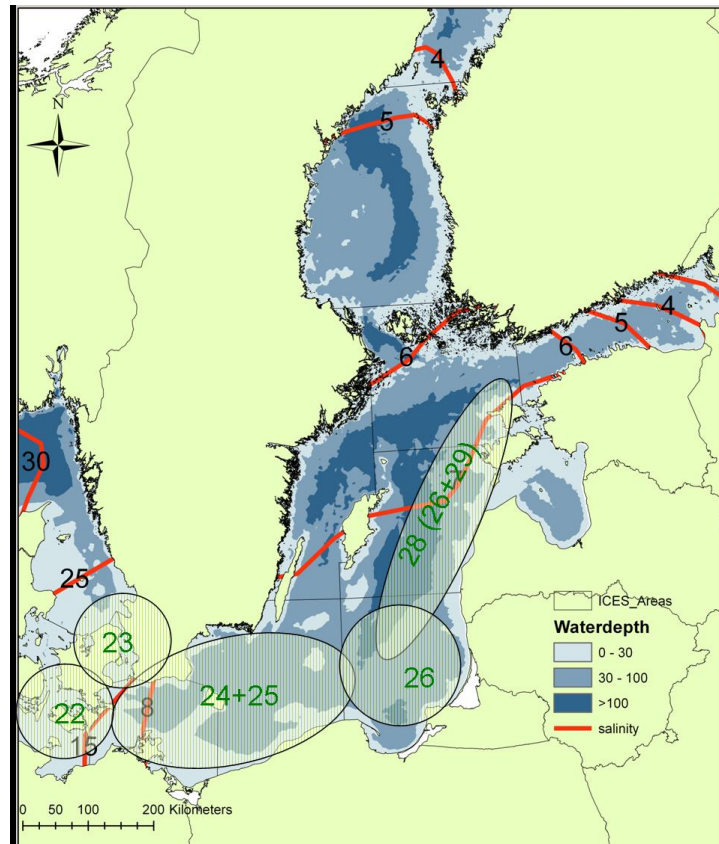


Figure 4.1 Approximate location of five identified stocks of pelagic flounder in the Baltic Sea. Numbers within circles refers to ICES SD.

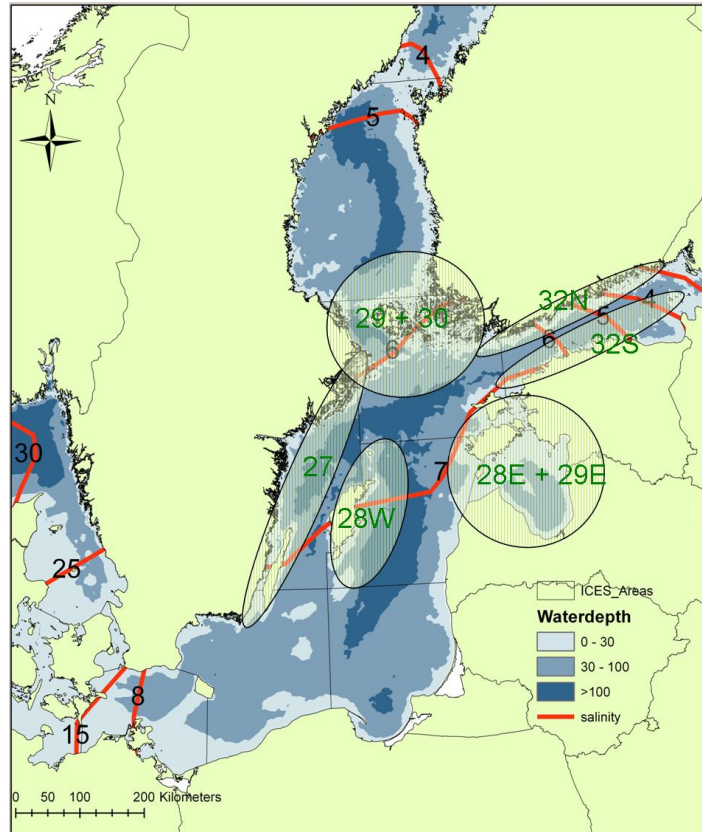


Figure 4.2. Approximate location of six identified stocks of demersal flounder in the Baltic Sea. Numbers within circles refers to ICES SD.