

6.4.20 Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak-Kattegat)

State of the stock

Spawning biomass in relation to precautionary limits	Fishing mortality in relation to precautionary limits	Fishing mortality in relation to high long-term yield	Fishing mortality in relation to agreed target	Comment
Full reproductive capacity	Undefined	Undefined	NA	

The most recent estimates of SSB (Q3 2009) show full reproductive capacity of the stock ($SSB > B_{pa}$). Catches and fishing mortality has been low in 2008 and first half year 2009. Fishing mortality has generally been lower than the natural mortality for this stock and has decreased in recent years well below the long term average F (0.6). Recruitment in 2008 was just below the long term average and in 2009 was above average.

Management objectives

No management objectives have been set for this stock. Due to the short-lived nature of this species a preliminary TAC is set every year, which is updated on the basis of advice in the first half of the year.

Reference points

	Type	Value	Technical basis
Precautionary approach	B_{lim}	90 000 t	B_{loss} , the lowest observed biomass in the 1980s
	B_{pa}	150 000 t	Below-average recruitment when SSB is less than 150 000 t.
	F_{lim}		None advised
	F_{pa}		None advised
Targets	F_v	not defined	

(unchanged since 1997)

Single-stock exploitation boundaries

ICES advises on the basis of precautionary limits that in order to maintain the spawning stock biomass above B_{pa} in 2010 catches should be restricted to less than 307,000 t.
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Short-term implications

Outlook for 2010

Basis: $F(2009) = [F_{Q1\&2_{09}} + F_{Q3\&4_{08}}] = 0.240$; Catch (2009) = 45 ; $SSB(2010) = 200$; $R(2010) = 25\%$ percentile of 1983-2009 2nd quarter ~ 72 Billions.

Rationale	Catches (2010)	F 2010	SSB (2011)	%SSB Change ¹
Precautionary Limits	0	0.00	258	29 %
	50	0.05	245	23 %
	105	0.11	220	10 %
	208	0.24	183	-9 %
	279	0.35	159	-21 %
	307	0.40	150	-25 %
	332	0.45	142	-29 %
	366	0.52	131	-35 %
	399	0.59	121	-40 %
480	0.83	98	-51 %	

Weights in '000 t. Shaded scenarios are not considered consistent with the precautionary approach.

¹ SSB 2011 relative to SSB 2010.

Management considerations

Norway pout is a short-lived species. Recruitment is highly variable and influences SSB and TSB rapidly, due to the short life span of the species. With present fishing mortality levels, the status of the stock is mainly determined by natural processes and less by the fishery.

Historically, the fishery includes bycatches especially of haddock, whiting, saithe, and herring. Existing technical measures to protect these bycatch species should be maintained or improved. Bycatches of these species have been low in the recent decade. Studies have shown that sorting grids in combination with square mesh panels reduce bycatches of whiting and haddock by 57% and 37%, respectively (Eigaard and Holst, 2004; ICES 2006a ICES CM 2006/ACFM:35; Eigaard and Nielsen, 2009); ICES suggests that these devices should be brought into use in the fishery. The introduction of these technical measures should be followed up by adequate control measures to ensure effective implementation of the existing bycatch measures. The Norwegian fishery for Norway pout in 2009 has been extended to the 1st of November provided the use of sorting grids.

Despite opening of the fishery by 1st January 2008 (with preliminary EU quota of 36 500 t and a Norwegian quota of 4 750 t as well as a final EU quota of 110 000 t set late in 2008) only 36 100 t was taken in total. Based on the assumed average 2008 recruitment ICES in May 2009 advised a TAC on 157 000 t for 2009. An initial EU quota of 26 000 t and a Norwegian quota of 1 000 t for by-catch was set for the first half year 2009. Catches in 1st half of 2009 amount to only 4 200 t, which was dominated by Norwegian by-catch (3 700 t) in the mixed blue whiting and Norway pout fishery. The final TAC for 2009 was set at 157 000 t (following the escapement strategy) of which 117 300 t (app. 75%) is EU quota.

The catch forecast for 2010 assumes status quo fisheries in 2009, with catches of 45 000 t. This is well below the quota for 2009 (157 000 t). In case the quota are fully taken in 2009 this will result in lower catch forecasts for 2010 (226 000 t to reach Bpa by 2011).

There is bi-annual information available to perform real time monitoring and management of the stock. This can be carried out both with fishery independent and fishery dependent information as well as a combination of those. Real time advice (forecast) and management options for 2010 will be provided for the stock in spring 2010 as well.

Management plan evaluations

No management plan has been agreed, but ICES has evaluated and commented on three management strategies, following requests from managers – fixed fishing mortality (0.35), fixed TAC (50 000 t), and a variable TAC escapement strategy. The evaluation shows that all three management strategies are capable of generating stock abundance that stay above B_{lim} with a high probability in the long term and are therefore considered to be in accordance with the precautionary approach.

The choice between different strategies depends on the requirements that fisheries managers and stakeholders have regarding stability in catches or the overall level of the catches. The escapement strategy has a higher long-term yield compared to the fixed fishing mortality strategy, but at the cost of a substantially higher probability of having closures in the fishery. If the continuity of the fishery is an important property, then the fixed F (equivalent to fixed effort) strategy will perform better.

Under a fixed F-management-strategy with F around 0.35 a catch of no more than 279 000 t can be taken in 2010. Under a fixed TAC strategy a TAC of 50 000 t can be taken in 2010 according to the long term management strategies for the stock.

Impacts of fisheries on the ecosystems

Norway pout is an important prey species for a variety of fish species (e.g. saithe, haddock, and mackerel). Natural mortality levels by age and season used in the stock assessment do reflect the predation mortality levels estimated for this stock in the most recent multi-species stock assessment performed by ICES (ICES 2006b). Growth and mean weight-at-age for the above-mentioned predators seems independent of the stock size of Norway pout.

Historically, the fishery includes bycatches especially of haddock, whiting, saithe, and herring. Bycatches of these species have been low in the recent decade.

Factors affecting the fisheries and the stock

Regulations and their effects

The Norway pout fishery is regulated through a single-species TAC and by technical measures such as minimum mesh size in the trawls, fishing area closure in e.g. the Norway pout box in the north-western part of the North Sea, and bycatch regulations in the fishery to protect other species.

The directed fishery for Norway pout was closed in 2005, the first half of 2006 and in 2007. Bycatch regulations in force have reduced bycatches in recent years.

Scientific basis

Data and methods

The analytical seasonal XSA assessment model fitted for this stock is based on time-series of catch-at-age, one commercial cpue series, and four research survey series. The assessment provides stock status (including 0-group) up to 1st of April 2009. The autumn assessment includes observations from the surveys in the 3rd quarter of 2008 and landings for the first quarter year 2009.

Uncertainties in assessment and forecast

The assessment uses constant natural mortality, although variable mortality has been estimated. There is uncertainty in the maturity-at-age, which may have a large impact on the predictions and estimates of the SSB because the stock consists of very few year classes.

Comparison with previous assessment and advice

The estimates of the SSB and of the average fishing mortality of ages 1 and 2 are consistent with the estimates of previous year's assessment. The basis of the advice is the same as the advice in May 2009.

Sources of information

Eigaard, O. R., and Holst, R. 2004. The effective selectivity of a composite gear for industrial fishing: a sorting grid in combination with a square mesh window. *Fisheries Research*, 68: 99-112.

ICES 2006a. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 5–14 September 2006, ICES Headquarters. ICES CM 2006/ACFM:35.

ICES. 2006b. Report of the Study Group on Multispecies Assessments in the North Sea (SGMSNS), 20–25 February 2006, ICES Copenhagen. ICES CM 2006/RMC:02.

ICES. 2009. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak, 6-12 May 2009. ICES CM 2009/ACOM:10.

Table 6.4.20.1 Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). Single stock exploitation boundaries (advice), management and landings.

Year	ICES Advice	Predicted catch corresp. to advice	Agreed TAC ¹	Official Landings	ICES landings
1987	No advice	-	200	215	147
1988	No advice	-	200	187	102
1989	No advice	-	200	276	167
1990	No advice	-	200	212	140
1991	No advice	-	200	223	155
1992	No advice	-	200	335	255
1993	No advice	-	220	241	176
1994	No advice	-	220	214	176
1995	Can sustain current F	-	180	289	181
1996	Can sustain current F; take bycatches into consid.	-	220	197	122
1997	Can sustain current F; take bycatches into consid.	-	220	155	133
1998	Can sustain current F; take bycatches into consid.	-	220	72	62
1999	Can sustain current F; take bycatches into consid.	-	220	93	85
2000	Can sustain current F; take bycatches into consid.	-	220	182	175
2001	Can sustain current F; take bycatches into consid.	-	211	63	57
2002	Can sustain current F; take bycatches into consid.	-	198	93	74
2003	Can sustain current F; take bycatches into consid.	-	198	24	21
2004	The stock is in risk of decreasing below B_{lim}	-	198	16	14
2005	Fishery should be closed	-	5	1	2
2006	Fishery closed until 4th August where a TAC of 95 000 t was set.	-	95	54	47
2007	Fishery closed because $SSB < B_{pa}$ in 2008.	-	5	6	6
2008	$F=0.35$ or 50 000 t for first half of 2008	< 50 in 1 st 6 m	42.5		
In year ² :	Maintain $SSB > B_{pa}$	< 148	115	39	36
2009	Reduce F to increase $SSB > B_{pa}$	< 35	28.25		
In year:	Maintain $SSB > B_{pa}$	< 157	157		
2010	Maintain $SSB > B_{pa}$	< 307			

Weights in '000 t.

¹ Divisions IIa(EU) and IIIa, and Subarea IV(EU).

² For Norway pout preliminary advice is given in autumn, while the in year advice is given on the basis of the first surveys in the TAC year.

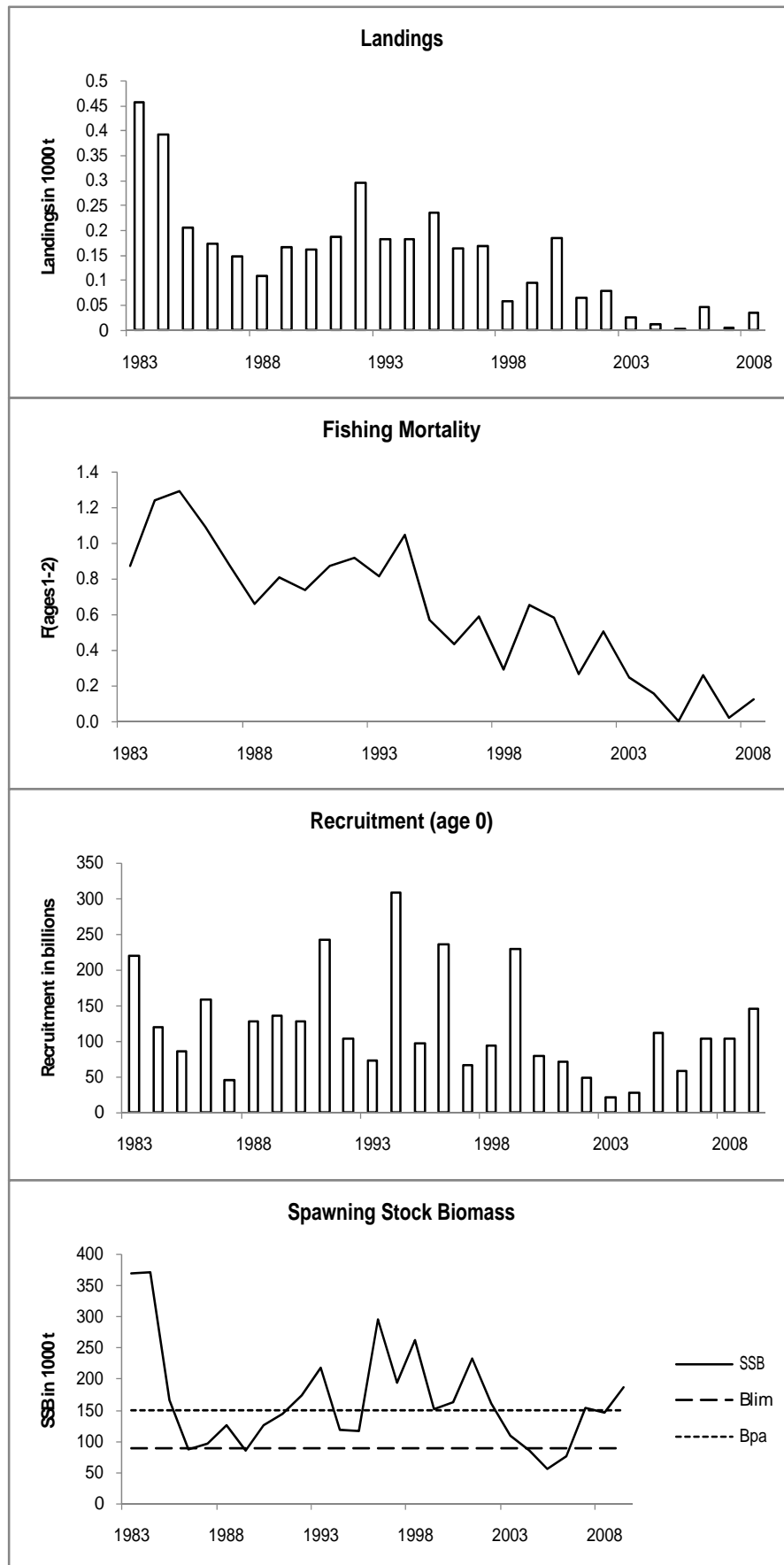


Figure 6.4.20.1 Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). Summary of stock assessment (AUTUMN): landings, fishing mortality, recruitment, and SSB.

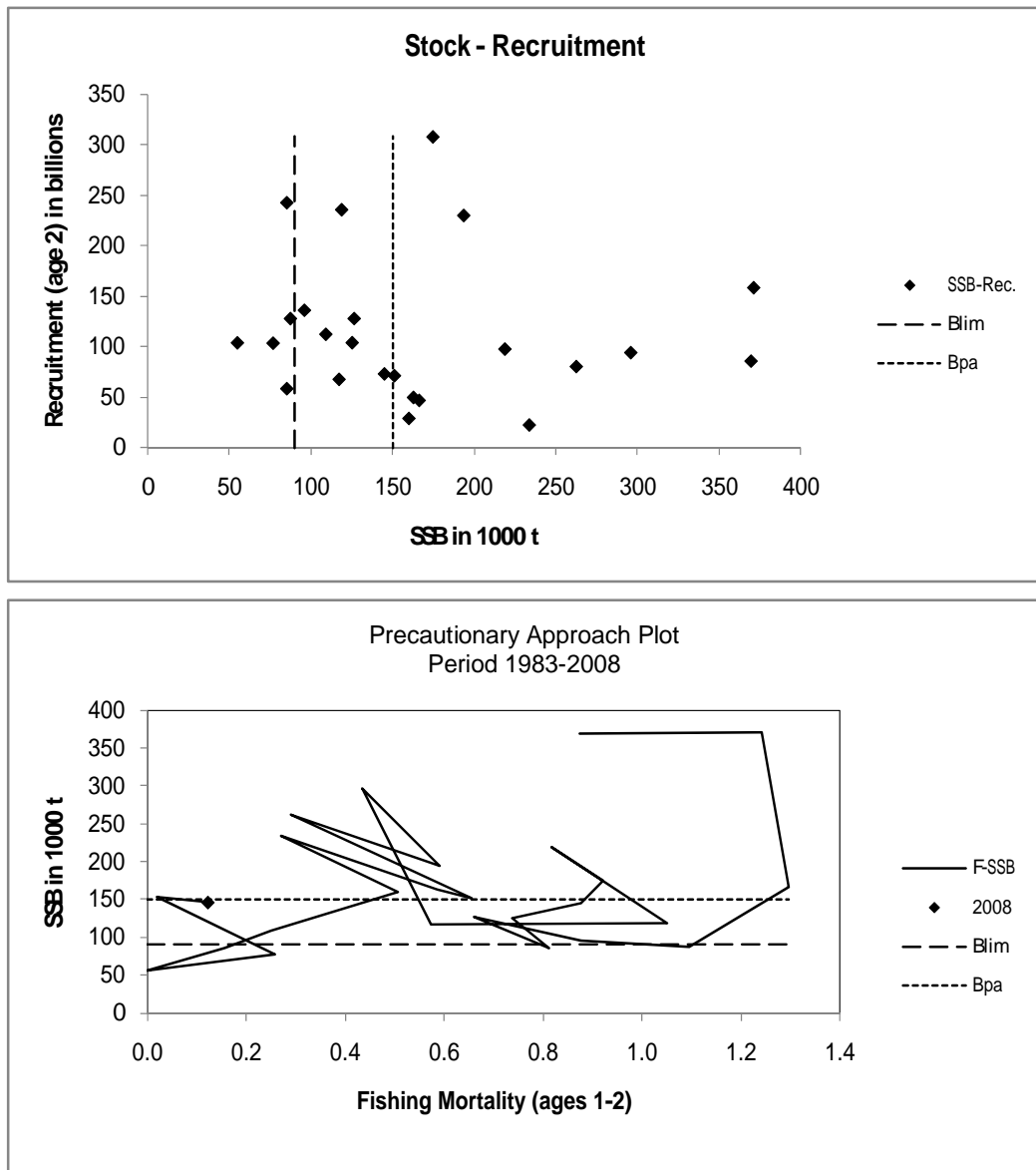


Figure 6.4.20.2 Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). Precautionary approach plot and stock-recruitment relationship (AUTUMN).

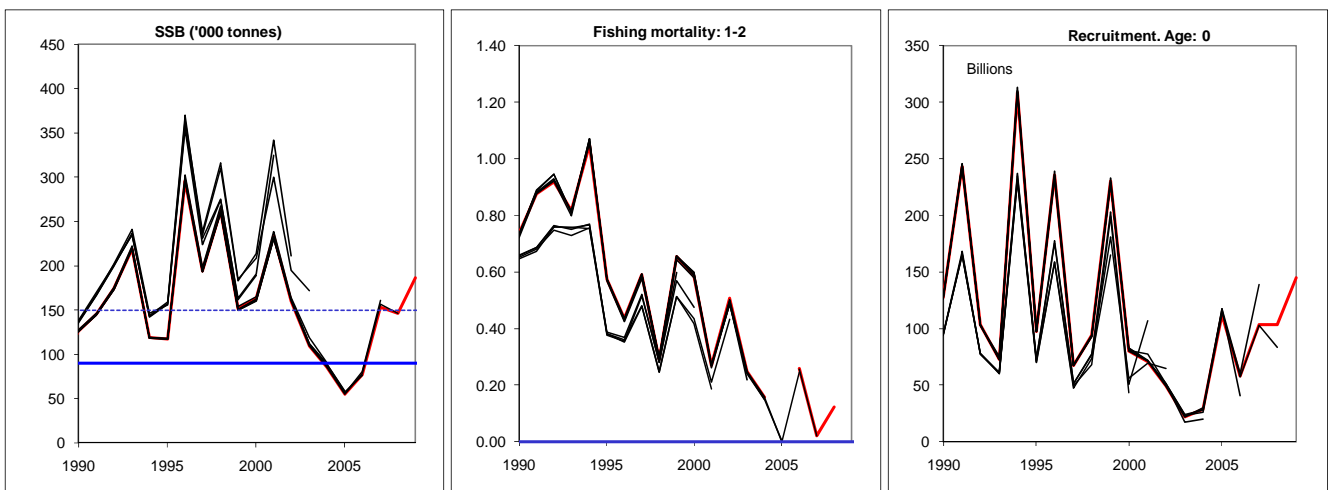


Figure 6.4.20.3 Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). Comparison of current assessment with previous assessments. Retrospective plots of final SXSA assessment (AUTUMN).

Table 6.4.20.2 Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). National landings (t) by quarter (Data provided by Working Group members). Norwegian landing data include landings of bycatch of other species. Includes bycatch of Norway pout in other (small-meshed) fisheries.

Year	Quarter	Denmark									Norway		Total	
		Area	IIIaN	IIIaS	Div. IIIa	IVaE	IVaW	IVb	IVc	Div. IV	Div. IV + IIIaN	IVaE		Div. IV
1994	1		568	75	643	18,660	3,588	533	-	22,781	23,350			
	2		4	0	4	511	170	-	-	681	685			
	3		2,137	74	2,211	5,674	12,604	493	-	18,772	20,908			
	4		3,623	116	3,739	5,597	49,935	91	-	55,622	59,246			
	Total		6,332	265	6,598	30,442	66,298	1,117	-	97,857	104,189			
1995	1		576	9	585	19,421	1,336	7	-	20,764	21,339	15521	15521	36,860
	2		10,495	290	10,793	2,841	30	3,670	-	6,540	17,035	10639	10639	27,674
	3		20,563	976	21,540	13,316	17,681	11,445	-	42,442	63,004	5790	5790	68,794
	4		14,748	2,681	17,430	10,812	56,159	1,426	-	68,396	83,145	11131	11131	94,276
	Total		46,382	3,956	50,347	46,390	75,205	16,547	-	138,142	184,524	43,081	43081	227,605
1996	1		1,231	164	1,395	6,133	3,149	658	2	9,943	11,174	10604	10604	21,778
	2		7,323	970	8,293	1,018	452	1,476	-	2,946	10,269	4281	4281	14,550
	3		20,176	836	21,012	7,119	17,553	1,517	-	26,188	46,364	27466	27466	73,830
	4		5,028	500	5,528	9,640	25,498	42	-	35,180	40,208	5466	5466	45,674
	Total		33,758	2,470	36,228	23,910	46,652	3,692	2	74,257	108,015	47,817	47817	155,832
1997	1		2,707	460	3,167	6,203	2,219	7	-	8,429	11,137	4183	4183	15,320
	2		5,656	200	5,857	141	-	45	-	185	5,842	8466	8466	14,308
	3		16,432	649	17,081	19,054	21,024	740	-	40,818	57,250	21546	21546	78,796
	4		4,464	1,042	5,505	6,555	38,202	7	-	44,765	49,228	4884	4884	54,112
	Total		29,259	2,351	31,610	31,953	61,445	799	-	94,197	123,456	39,079	39079	162,535
1998	1		1,117	317	1,434	7,111	2,292	-	-	9,403	10,520	8913	8913	19,433
	2		3,881	103	3,984	131	5	124	-	259	4,140	7885	7885	12,025
	3		6,011	406	6,417	7,161	1,763	2,372	-	11,297	17,308	3559	3559	20,867
	4		2,161	677	2,838	1,051	17,752	77	-	18,880	21,041	1778	1778	22,819
	Total		13,171	1,503	14,673	15,454	21,811	2,573	-	39,838	53,009	22,135	22135	75,144
1999	1		4	12	15	2,769	1,246	1	-	4,016	4,020	3021	3021	7,041
	2		1,568	36	1,605	953	361	418	-	1,731	3,300	10321	10321	13,621
	3		3,094	109	3,203	7,500	3,710	2,584	-	13,794	16,887	24449	24449	41,336
	4		2,156	517	2,673	3,577	16,921	928	1	21,426	23,583	6385	6385	29,968
	Total		6,822	674	7,496	14,799	22,237	3,931	1	40,968	47,790	44,176	44176	91,966
2000	1		0	11	12	3,726	1,038	-	-	4,764	4,765	5440	5440	10,205
	2		929	15	944	684	22	227	-	933	1,862	9779	9779	11,641
	3		7,380	139	7,519	1,708	5,613	515	-	7,836	15,216	28428	28428	43,644
	4		947	209	1,157	1,656	111,732	76	-	113,464	114,411	4334	4334	118,745
	Total		9,257	375	9,631	7,774	118,406	818	-	126,998	136,255	47,981	47981	184,236
2001	1				302	7,341	9,734	103	72	17,250	17,250	3838	3838	21,088
	2				2,174	31	30	269	-	330	330	9268	9268	9,598
	3				2,006	15	154	191	-	360	360	2263	2263	2,623
	4				3,059	2,553	19,826	329	-	22,708	22,708	1426	1426	24,134
	Total				7,541	9,940	29,744	892	72	40,648	40,648	16,795	16795	57,443
2002	1		-	1	1	4,869	1,660	114	-	6,643	6,643	1896	1896	8,539
	2		883	161	1,045	56	9	22	-	87	970	5563	5563	6,533
	3		1,567	213	1,778	2,234	14,739	104	-	17,077	18,644	14147	14147	32,791
	4		393	100	492	1,787	24,273	335	-	26,395	26,788	2033	2033	28,821
	Total		2,843	475	3,316	8,946	40,681	575	-	50,202	53,045	23,639	23639	76,684
2003	1		-	1	1	615	581	22	-	1,218	1,218	1977	1977	3,195
	2		246	160	406	76	-	22	-	98	344	2773	2773	3,117
	3		2,984	1,005	3,989	172	1,613	89	-	1,874	4,858	5989	5989	10,847
	4		188	547	735	0	6,270	457	-	6,727	6,915	644	644	7,559
	Total		3,418	1,713	5,131	863	8,464	590	-	9,917	13,335	11,383	11,383	24,718
2004	1		316	-	316	87	650	-	-	737	1,053	989	989	2,042
	2		-	-	-	-	-	7	-	7	7	660	660	667
	3		14	-	14	289	1,195	9	-	1,493	1,507	2484	2484	3,991
	4		13	-	13	93	5,683	107	-	5,883	5,896	865	865	6,761
	Total		343	-	343	469	7,528	123	-	8,120	8,463	4,998	4,998	13,461
2005	1		-	-	-	9	-	-	-	9	9	12	12	21
	2		-	-	-	151	-	-	-	151	151	352	352	503
	3		-	-	-	781	-	-	-	781	781	387	387	1,168
	4		-	-	-	-	-	-	-	-	-	211	211	211
	Total		-	-	-	941	-	-	-	941	941	962	962	1,903
2006	1		-	-	-	75	83	-	-	158	158	2,205	2205	2,363
	2		-	-	-	-	-	15	-	15	15	2,846	2846	2,861
	3		114	-	114	-	649	20	-	669	783	5,749	5749	6,532
	4		3	-	3	-	34,262	-	-	34,262	34,265	605	605	34,870
	Total		117	-	117	75	34,994	35	-	35,104	35,221	11,405	11,405	46,626
2007	1		-	-	-	561	789	-	-	1,350	1,350	74	74	1,424
	2		-	-	-	4	-	-	-	4	4	1,097	1097	1,101
	3		1	2	3	-	-	-	-	-	1	2,429	2429	2,430
	4		-	-	-	-	682	-	-	682	682	155	155	837
	Total		1	2	3	565	1,471	-	-	2,036	2,037	3,755	3,755	5,792
2008	1		125	-	125	19	86	123	-	228	353	7	7	360
	2		-	-	-	-	-	30	-	30	30	1,803	1803	1,833
	3		-	-	-	-	6,102	-	-	6,102	6,102	3,582	3582	9,684
	4		-	-	-	-	22,686	1,239	-	23,925	23,925	336	336	24,261
	Total		125	-	125	19	28,874	1,392	-	30,285	30,410	5,728	5,728	36,138
2009	1		-	-	-	22	515	-	-	537	537	-	0	537
	2		-	-	-	-	-	-	-	-	-	3,664	3664	3,664

Table 6.4.20.3 Norway pout in Subarea IV (North Sea) and Division IIIa (Skagerrak–Kattegat). Summary of stock assessment (SXSA Baseline, September 2009).

Year	Recruitment Age 0 millions	SSB tonnes	Landings tonnes	Mean F Ages 1-2
1983	220802	369563	457.6	0.873
1984	119296	371187	393.01	1.241
1985	85398	166487	205.1	1.295
1986	158392	87700	174.3	1.096
1987	46300	96254	149.3	0.876
1988	127648	126699	109.3	0.660
1989	135974	85492	166.4	0.812
1990	127714	125481	163.3	0.736
1991	242921	145222	186.6	0.876
1992	103699	174908	297	0.920
1993	72659	218949	183	0.816
1994	308419	119040	182	1.051
1995	97346	117481	237	0.573
1996	235931	295997	164	0.435
1997	67226	193745	169.7	0.590
1998	93816	262649	58	0.291
1999	230253	151325	95	0.654
2000	79951	162987	184	0.585
2001	70810	233895	66	0.269
2002	49267	160206	80	0.506
2003	21847	109373	27	0.249
2004	28380	85507	14	0.156
2005	112085	55260	2	0.000
2006	57961	77117	47	0.258
2007	103532	152908	6	0.020
2008	103206	145974	36	0.122
2009	145089	186149		
Average	120219	165835	148	0.614