

8 Tagging and marking

8.1 Present tagging and marking

8.1.1 Fin-clipping

Data on numbers of adipose fin-clipped salmon and sea trout are given in Table 8.1.1.1. In almost all cases fin-clippings were aimed at distinguishing between reared/enhanced salmon or sea trout from the wild production. There is continuous increasing trend in number of fin-clipped parr and smolt since 2003.

In 2006 total number of fin-clipped salmon parr and smolt decreased 30% comparing to 2005 and was 2,012,000. Out of this it was 260,000 parr and 1,750,000 smolt. Comparing to 2005 the number of fin-clipped salmon parr decreased fourfold but number of fin-clipped salmon smolt decreased 15%.

In 2006 32% of all reared salmon smolt production and 24% of all reared sea trout smolt production was fin-clipped, which was at the same level as in 2005.

The total number of fin-clipped sea trout smolt was 950,000 and was 35% higher than in 2004.

Most fin-clippings (in numbers) were carried out in Sub-divisions 30 and 31.

Starting in 2005 it is mandatory in Sweden to fin-clip all salmon and sea trout. In 2006 the number of fin-clipped sea trout exceeds the number of reared smolts because also younger stages were fin-clipped being prepared for mandatory releases.

All Estonian salmon and sea trout smolts and 2yr old sea trout smolts in Latvia were fin-clipped in 2006. In Poland all salmon and sea trout smolts released into Reda River were adipose fin clipped. In Russia 91 700 1-yr salmon smolts in Luga hatchery were fin-clipped.

The observed proportion of fin-clipped salmon in Latvian offshore catches dropped from level of 6 -7% in 2000-2001 to the level of 3% in 2004 -2006 (Table 8.1.1.2).

8.1.2 External Tagging

The number of Carlin tagged reared salmon was 94,000 in 2006 (Table 8.1.2.1), which was 13% less than in 2005. The share of tagged salmon in all releases was the same as in the 2005 – 2%. In 2006 total number of tagged sea trout was 71,000 (Table 8.1.2.2) and it was 10% less than in 2005.

Small amount of salmon smolts in Lithuania were tagged with Floy tags.

The recapture rate of salmon and sea trout smolts shows rather decreasing trend in last years in the Gulf of Bothnia, Gulf of Finland and Main Basin (Figures 8.1.1, 8.1.2, 8.1.3, 8.1.4, 8.1.5, 8.1.6), however, recapture rate has been even lower in the Baltic Main Basin (0.2–7.0%). In the Gulf of Bothnia recapture rate was at similar level in Swedish and Finnish tagging in 1980–2002. Based on Finnish data, there is observed lower recapture rate of salmon and sea trout in the Gulf of Bothnia than in Gulf of Finland. Tagging results indicates the long-term variation in the survival and the fluctuation seems to follow the same path in all countries. According to tagging data the survival of the released smolts is at present lower than a long-term average.

There is a need to increase tag reporting rates in most of countries since increased returns will substantially improve quality of salmon assessments.

8.2 Sources of error and estimation of accuracy of estimates

Possible sources of error in application of results from tagging experiments include the question of differential mortality between tagged and untagged fish and when this (possible) mortality occurs, also tag shedding (loss of tags) and whether this is related to the size of the fish. Possible difference in growth rate of tagged and untagged fish could be a problem. Reporting rate (proportion) of the tags caught in different fisheries are also important pieces of information to be able to use tagging data.

A considerable mix-up of these different factors is likely and in most cases it is difficult to keep the different factors apart.

8.2.1 Tag shedding and mortality

It is vital for the tagging studies to have at least an overall estimate for tag shedding rate. Some information on salmon can be found in the data from Swedish brood stock fisheries in Gulf of Bothnia based on numbers of fish released in each year in 1987-1998 and the number of fish recovered in year 1990-1999. It is assumed that all tags in these fisheries are reported and therefore they can be used to elucidate the combined effect of tag shedding and difference in mortality between tagged and untagged. If the recovery rate in brood stock fisheries is compared with tag recoveries in rivers and river mouth areas, data on reporting rates can be calculated.

It is assumed that the best dataset is available from River Dalälven, which has a meticulous control of the number of the fish caught in the brood stock fishery. There is also a very good organization of the angling in this river and the catch statistics in this river is therefore assumed to be of particularly high class. The data from this river suggests that the tag shedding/mortality remove about 30% of the number of tags.

8.2.2 Tag reporting rate

Tagging in Baltic salmon monitoring programs is mostly based on Carlin type of tags relying on tag recoveries being reported by the public. Therefore it is vital that fishermen find and report all tags. Some studies to estimate the reporting rate has been carried out in the Baltic Sea and their results indicate an obvious unreporting.

Backiel and Bartel (1967), working on sea trout, assumed that the increased mortality, tag loss and incomplete discovery and/or return brought about an underestimation of recaptures by ca. 15%. Debowski and Bartel (1996), based on analysis of tagging experiments in 1961 through 1986, estimated that underestimation of stocking efficiency, which was caused by not reported tags and increased mortality of tagged smolts was up to 40%. Decreasing trend in returns can be to some extent explained also by catch limits and the attitude of fishermen, which are afraid to return tags because they think, those tags can prove, to some extent, exceeded catch limits. In Poland, increase of reward paid to fishermen does not affect seriously returning rates.

In Denmark two high rewarded-tag sea trout release experiments were conducted in 1988. Increase in return rates were 10.2 % and 62.5 % respectively, depending on local awareness and local fishing patterns. It is, however, doubtful if these results can be extrapolated to the whole Baltic salmon fishery.

A larger Swedish dataset exists from the offshore fishery in the Main Basin. A fisherman at Gotland, assumed to be reliable on the basis of earlier experiences, agreed to report all tags he found in the catches. When comparing the number of Swedish tags that he found in his catches, to the total number of Swedish tags reported, some underreporting from this fishery was indicated.

Observations from the offshore drift net fishery in the Main Basin in 2002, involving observers on board two salmon fishing boats suggest that slightly less than 1 % of salmon caught is tagged with Carlin tags. This number may be compared to results from other analysis, assuming equal number of recaptures of tagged salmon in all samples of salmon.

Reporting rate may vary between countries. Comparison of reporting rates from two countries fishing in the Baltic Main Basin indicates, that one country can report significantly less than the other.

An experiment with different rewards for different tags (electronic Data Storage Tags – DST's) and conventional - Carlin tags, was conducted in the coastal fishery in the Gulf of Bothnia in 1995-1997. For the DST tags it was clearly stated that a substantial reward was offered. Clear differences in recapture rates were observed. However, it was not ascertained that the two tag types were mixed, and the results should be taken with caution. Nonetheless substantial differences in reporting were observed.

Comparing reporting rate from anglers in the Dalälven to observations in the brood stock fishery data from Dalälven suggests that the reporting rate by anglers in the river is about 80%.

In the Gulf of Finland studies from the late 1980s suggested that the reporting rate varied between 40-75% (median 55%).

The return rates of sea trout taggings have decreased during the last ten years in the Finnish sea trout taggings, both in the Gulf of Bothnia and Gulf of Finland (Fig. F9_1_2_2). If similar poor post smolt survival occurs also for wild sea trout stocks, these results must be considered as an additional risk factor for sea trout.

8.3 Tagging data in the Baltic salmon stock assessment

Tagging data in combination with the tag reporting rates have been used within the assessment of Baltic salmon in order to estimate the population parameters as well as the exploitation rates by the different fisheries (section 5.3.8). Table 8.4.1 gives an overview of the number of tagged hatchery-reared and wild salmon released in rivers of assessment areas 1, 2 or 3. Tables 8.4.2-18 present numbers of tagged reared salmon released in different areas and years of recaptures in particular fisheries. No reliable Swedish tagging data have been available for recent years hence the large decrease in tagged salmon in areas 2 and 3. For wild salmon only salmon from area 1 have been tagged and not in every year. The number of wild tagged salmon has increased during recent years. The tables showing the recaptures of tagged salmon can be found in the WGBAST report of 2005 (ICES 2005). The tables show the year of release and how many years after the year of release the salmon are recaptured again by the different fisheries.

Table 8.1.1. Adipose and pelvic finclipped salmon and sea trout released in the Baltic Sea area in 2006.

Country	Species	Stock	Age	Number		River	Sub-division	Other tagging		
				parr	smolt					
Estonia	salmon	Neva	1		10,300	Loobu	32	700 Carlin		
		Neva	1	40,000		Narva	32			
		Neva	1	10,000		Selja	32			
		Neva	1	31900		Valgejõgi	32			
		Neva	2		10,500	Valgejõgi	32		700 Carlin	
		Neva	2		6,300	Jägala	32		500 Carlin	
		Neva	1	31,400		Pirita	32			
		Neva	2		10,400	Pirita	32		700 Carlin	
		Neva	2		10,400	Selja	32		700 Carlin	
Finland	salmon	Tornionjoki	2		3,800	Tornionjoki	31	3800 Carlin		
		Simojoki	2		1,000	Simojoki	31	1000 Carlin		
Sweden	salmon	Lule	2	36,200	538,494	Luleälven	31	11000 Carlin		
		Skellefteälven	2		122,738	Skellefteälven	31			
		Ume	2		24,170	Umeälven	31	1000 Carlin		
		Skellefteälven	2		6,100	Gideälven	30	1000 Carlin		
		Ångermanälven	2		218,321	Ångermanälven	30	5000 Carlin		
		Indalsälven	2	17,514	312,184	Indalsälven	30	3958 Carlin		
		Ljusnan	2		213,000	Ljusnan	30			
		Dalälven	2		1,119	Tasteboan	30			
		Dalälven	2		650	Gavleån	30			
		Dalälven	2		236,067	Dalälven	30	4000 Carlin		
		Indalsälven	2		9,500	Stockholms Ström	27	500 Carlin		
		Indalsälven	2		18,500	Coastal	27			
		Poland	salmon	Dougava	1		41,000	Slupia	25	
		Russia	salmon	Luga	1	91,700		Luga	32	1400 Carlin
Total salmon				258,714	1,794,543					
Estonia	sea trout	Õngu	2		4,000	Coastal	29	200 Carlin		
Sweden	sea trout	Luleälven	2		83,559	Luleälven	31	2000 Carlin		
		Skellefteälven	2		18,363	Skellefteälven	31	1000 Carlin		
		Umeälven	2		96,367	Umeälven	31	2000 Carlin		
		Skellefteälven	2		7,000	Gideälven	30	1000 Carlin		
		Ångermanälven	2		48,474	Ångermanälven	30	1000 Carlin		
		Indalsälven	1		9,425	Indalsälven	30			
		Indalsälven	2		92,998	Indalsälven	30	2000 Carlin		
		Mjällån	2		9,425	Indalsälven	30			
		Ljungan	2		36,200	Ljungan	30	2000 Carlin		
		Ljusnan	1		10,000	Harmångersån	30			
		Ljusnan	2		73,500	Ljusnan	30			
		Ljusnan	1		1,500	Skarjan	30			
		Ljusnan	1		1,500	Tvaran	30			
		Ljusnan	1		1,320	Kvaman	30			
		Ljusnan	1		1,300	Soderhamnsån	30			
		Dalälven	2		1,333	Gavleån	30			
		Dalälven	2		3,810	Coastal	30	2000 Carlin		
		Ljusnan	2		1,000	Coastal	30			
		Weich,Dalalv.	2		71,115	Dalälven	30	2500 Carlin		
		Åvaå	2		2,300	Akerstrom	27			
Åvaå	2		8,300	Stockholms St.	27	400 Carlin				
Åvaå	1		30,000	Stockholms St.	27					
Åvaå	1		24,100	Other rivers	27					
Åvaå	2		8,500	Other rivers	27					
Åvaå	1		5,000	Coastal	27					
Åvaå	2		7,350	Nyköpingsån	27					
Åvaå	1		65,750	Coastal	27					
Åvaå	2		17,000	Coastal	27	800 Carlin				
		Gullspång	2		8,500	Motala ström	27			
		Morrum	1		6,100	Morrum	25			
Poland	sea trout	Vistula	2		15,000	Reda	26			
		Slupia	2		83,000	Slupia	25			
Latvia	sea trout	Dougava	2		61,430	Dougava	28			
		Gauja	2		33,230	Gauja	28			
Total sea trout				0	947,749					

Table 8.1.1.2 Releases of adipose fin clipped salmon in the Baltic Sea and the number of adipose fin clipped salmon registered in Latvian (sub-divisions 26 and 28) offshore catches.

Year	Releases of adipose fin clipped salmon, Sub-divs. 24-31		Latvian offshore catches	
	Parr	Smolt	Sub-divs. 26 and 28	
			Adipose fin clipped salmon in %	Sample N
1984			0.6	1,225
1985			1.0	1,170
1986			1.2	1,488
1987	43,149	69,000	0.6	1,345
1988	200,000	169,000	1.2	1,008
1989	353,000	154,000	1.5	1,046
1990	361,000	401,000	0.8	900
1991	273,000	319,000	1.4	937
1992	653,000	356,000	5.0	1,100
1993	498,000	288,000	7.8	900
1994	1,165,000	272,000	1.6	930
1995	567,470	291,061	2.0	855
1996	903,584	584,828	0.6	1,027
1997	1,626,652	585,630	4.4	1,200
1998	842,230	254,950	4.8	543
1999	1,004,266	625,747	4.4	1100
2000	1,284,100	890,774	7.2	971
2001	610,163	816,295	6.0	774
2002	536,800	733,191	2.5	883
2003		324,002	2.4	573
2004	10,000	648,563	3.2	621
2005	794,500	2,124,628	3.0	546
2006	258,714	1,753,543	2.4	250

Table 8.1.2.1 Number of Carlin-tagged salmon released into the Baltic Sea in 2006.

Country	24	25	26	27	28	29	30	31	32	Total
Estonia									3,300	3,300
Finland						4492	3261	27774	3,991	39,518
Sweden				500			13,958	13,000		27,458
Latvia					2,000					2,000
Poland	5,000	4,000	7,500							16,500
Lithuania			1,026							1,026
Russia									4,400	4,400
Total	5,000	4,000	8,526	500	2,000	4,492	17,219	40,774	11,691	94,202

Table 8.1.2.2 Number of Carlin-tagged sea trout released into the Baltic Sea in 2006.

Country	22	24	25	26	27	28	29	30	31	32	Total
Estonia										200	200
Finland							3986	5589	6392	4477	20444
Sweden					1,200			10,500	5,000		16,700
Latvia						4,000					4,000
Poland		5,000	7,000	18,000							30,000
Total	0	5,000	7,000	18,000	1,200	4,000	3,986	16,089	11,392	4,677	71,344

Table 8.4.1 Number of tagged hatchery-reared and wild salmon smolts released in assessment units 1, 2 or 3. No Swedish tagging data have been available for recent years hence the large decrease in tagged salmon in areas 2 and 3.

YEAR	Reared salmon stocked in rivers without natural reproduction			Reared salmon stocked in rivers with natural reproduction			Wild salmon
	Unit 1	Unit 2	Unit 3	Unit 1	Unit 2	Unit 3	Unit 1
1987	22809	13258	23000	6900	1987	1994	629
1988	20251	13170	31366	4112	1989	2983	771
1989	11813	13157	36851	4432	2910	0	0
1990	9825	12824	30677	6469	3995	1996	0
1991	7974	13251	36158	6987	3990	1997	1000
1992	8920	12657	33450	4081	1996	1999	574
1993	6862	12656	33825	4969	1999	1991	979
1994	7081	12964	28717	4101	1997	2000	1129
1995	6988	12971	21877	4987	2000	0	0
1996	7967	13480	22429	5991	1000	1000	0
1997	4970	13403	22788	6984	1982	1997	0
1998	6929	13448	22052	2998	1974	994	1364
1999	7908	0	3004	7927	0	0	2759
2000	6662	0	2000	8484	0	0	3770
2001	7904	0	3498	8419	0	0	4534
2002	7458	0	1000	4986	0	0	3148
2003	7233	0	1497	6968	0	0	6299
2004	4982	0	999	3923	0	0	9604
2005	5970	0	1995	9994	0	0	6607
2006	7933	0	5255	10644	0	0	8034

Table 8.4.2 Number of tagged reared salmon released in rivers of area 1 and recaptured in the coastal trapnet fishery. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	0	15	6	0	1	1	1	1	1	0	1	0	0	0	0	0	0	6	0	0
1	53	280	139	56	197	91	10	68	28	63	49	17	46	85	30	43	45	17	5	NA
2	40	240	82	120	78	24	11	43	40	30	13	3	36	45	6	15	23	0	NA	NA
3	9	39	13	21	13	8	5	17	17	9	3	0	4	2	0	6	1	NA	NA	NA
4	1	1	2	2	1	1	0	1	0	0	0	0	4	0	0	2	NA	NA	NA	NA
5	0	0	2	2	0	0	0	2	0	0	0	0	1	0	2	NA	NA	NA	NA	NA

Table 8.4.3 Number of tagged reared salmon released in rivers of area 2 and recaptured in the coastal trapnet fishery. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	5	9	4	9	6	2	0	1	1	4	5	0	0	0	0	0	0	0	0	NA
1	29	262	102	49	167	68	13	110	48	61	96	42	0	0	0	0	0	0	NA	NA
2	36	179	116	115	63	48	36	124	64	38	34	0	0	0	0	0	0	NA	NA	NA
3	11	58	22	16	16	13	7	47	21	4	0	0	0	0	0	0	NA	NA	NA	NA
4	0	3	1	2	3	0	0	5	1	0	0	0	0	0	0	0	NA	NA	NA	NA
5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA

Table 8.4.4 Number of tagged reared salmon released in rivers of area 3 and recaptured in the coastal trapnet fishery. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	11	13	12	9	29	12	5	2	1	2	0	3	0	0	0	0	0	0	0	NA
1	23	239	151	93	599	261	238	294	51	25	41	26	25	0	2	6	1	2	NA	NA
2	56	371	183	258	218	266	109	346	52	46	8	10	22	0	2	2	3	NA	NA	NA
3	16	139	102	43	74	65	42	56	50	4	0	2	2	0	0	0	NA	NA	NA	NA
4	0	6	2	18	5	7	0	10	0	1	1	0	0	0	0	0	NA	NA	NA	NA
5	0	1	2	2	1	0	2	1	0	0	0	0	0	0	0	NA	NA	NA	NA	NA

Table 8.4.5 Number of tagged reared salmon released in rivers of area 1 and recaptured in the coastal gillnet fishery. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	6	44	6	4	4	5	1	6	1	1	1	6	1	0	0	0	0	0	3	1
1	42	140	91	59	78	80	11	42	26	21	30	19	14	17	16	4	11	1	3	NA
2	48	151	128	72	85	46	19	32	31	18	6	3	12	20	0	7	9	7	NA	NA
3	9	54	22	17	26	8	3	14	14	4	2	0	0	3	1	1	4	NA	NA	NA
4	1	25	2	3	1	0	0	3	0	1	0	0	0	0	0	0	0	NA	NA	NA
5	1	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA

Table 8.4.6 Number of tagged reared salmon released in rivers of area 2 and recaptured in the coastal gillnet fishery. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	7	11	9	0	8	3	7	8	9	2	1	5	0	0	0	0	0	0	0	NA
1	29	63	23	31	54	24	14	30	20	8	38	5	0	0	0	0	0	0	NA	NA
2	16	59	45	50	40	32	18	26	22	13	10	0	0	0	0	0	0	NA	NA	NA
3	10	20	7	15	11	3	3	27	14	2	0	0	0	0	0	0	NA	NA	NA	NA
4	2	2	0	2	0	1	2	1	3	0	0	0	0	0	0	0	NA	NA	NA	NA
5	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA

Table 8.4.7 Number of tagged reared salmon released in rivers of area 3 and recaptured in the coastal gillnet fishery. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	34	46	66	43	57	36	35	34	7	12	6	7	9	0	0	0	0	0	0	0
1	47	267	139	115	237	136	110	139	42	21	36	21	12	0	0	2	3	1	3	NA
2	46	263	203	198	126	85	55	120	34	34	20	2	5	2	2	0	1	1	NA	NA
3	22	77	43	47	27	24	10	39	9	9	0	0	0	0	1	0	0	NA	NA	NA
4	3	5	7	1	6	1	6	2	0	0	1	0	10	0	0	0	NA	NA	NA	NA
5	1	1	2	3	0	3	7	0	0	1	0	3	0	0	0	0	NA	NA	NA	NA

Table 8.4.8 Number of tagged **reared** salmon recaptured in the **coastal driftnet fishery**. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	1	2	3	1	1	0	8	0	0	0	0	0	0	0	0	0	0	0	0	NA
1	0	19	7	5	53	23	26	6	2	1	2	0	3	3	0	0	1	0	NA	NA
2	14	73	50	41	66	93	18	3	6	0	1	0	8	0	1	2	1	NA	NA	NA
3	7	14	17	7	15	0	4	1	1	0	1	0	0	1	0	0	NA	NA	NA	NA
4	0	3	3	0	0	3	0	4	0	0	0	0	0	0	0	NA	NA	NA	NA	NA
5	0	0	0	0	0	0	1	0	0	0	0	0	0	0	NA	NA	NA	NA	NA	NA

Table 8.4.9 Number of tagged **reared** salmon recaptured in the **offshore driftnet fishery**. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0.5	71	125	85	69	199	175	109	89	48	37	44	17	17	18	0	0	1	1	3	0
1.5	1529	3692	1851	1401	2539	1839	1104	1389	1101	789	920	127	161	126	20	134	68	10	1	NA
2.5	475	689	563	433	489	352	255	321	447	259	70	6	46	17	11	21	15	1	NA	NA
3.5	30	191	93	65	51	79	35	102	126	14	4	0	11	12	9	5	4	NA	NA	NA
4.5	50	53	34	10	24	26	31	66	10	0	8	1	0	3	1	0	NA	NA	NA	NA

Table 8.4.10 Number of tagged **reared** salmon recaptured in the **offshore longline fishery**. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0.5	16	44	16	12	6	27	14	12	14	3	21	14	0	4	2	2	0	3	0	0
1.5	219	506	341	115	239	325	86	315	430	145	398	40	35	11	46	36	27	4	0	NA
2.5	61	169	133	65	70	58	56	148	114	66	15	0	1	32	17	17	5	0	NA	NA
3.5	10	22	33	0	10	20	10	11	25	9	1	0	1	5	2	0	4	NA	NA	NA
4.5	9	36	3	0	1	1	3	3	0	0	1	0	1	10	2	11	NA	NA	NA	NA

Table 8.4.11 Number of tagged **reared** salmon recaptured in the **terminal river fishery**. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	38	18	35	25	29	25	13	14	13	9	3	10	0	1	1	0	0	0	0	0
1	69	359	205	174	186	148	30	163	96	93	118	78	6	3	2	4	3	2	0	NA
2	28	109	95	114	82	69	60	99	96	35	50	3	4	2	1	0	5	1	NA	NA
3	16	51	57	30	38	43	13	61	49	16	0	0	0	0	1	1	1	NA	NA	NA
4	0	3	1	2	1	0	4	1	3	0	0	0	0	0	0	0	NA	NA	NA	NA
5	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	NA	NA	NA	NA	NA

Table 8.4.12 Number of tagged **reared** salmon recaptured in rivers where the salmon can reproduce. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	6	2	11	223	7	16	3	34	3	15	15	2	2	0	1	0	1	1	0	0
1	2	24	6	3	12	6	1	14	4	6	14	2	4	9	1	1	5	0	0	NA
2	6	25	3	3	8	2	2	14	24	6	10	0	2	3	1	1	3	1	NA	NA
3	6	8	2	1	2	3	3	13	5	1	0	0	1	1	0	0	0	NA	NA	NA
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NA	NA	NA	NA	NA

Table 8.4.13 Number of tagged **wild** salmon released in rivers of **area 1** and recaptured in the **coastal trapnet fishery**. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	0	0	NA	NA	1	0	0	1	NA	NA	NA	0	0	1	1	0	0	0	1	NA
1	1	8	NA	NA	20	4	0	13	NA	NA	NA	1	7	9	9	11	7	9	NA	NA
2	3	10	NA	NA	17	2	0	10	NA	NA	NA	0	3	6	6	9	18	NA	NA	NA
3	0	5	NA	NA	0	1	2	5	NA	NA	NA	0	0	1	4	8	NA	NA	NA	NA
4	0	1	NA	NA	0	0	0	1	NA	NA	NA	0	2	0	4	NA	NA	NA	NA	NA
5	0	0	NA	NA	0	0	0	0	NA	NA	NA	0	0	0	NA	NA	NA	NA	NA	NA

Table 8.4.14 Number of tagged **wild** salmon released in rivers of **area 1** and recaptured in the **coastal gillnet fishery**. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	0	0	NA	NA	0	0	0	0	NA	NA	NA	0	0	1	0	0	0	0	0	NA
1	0	3	NA	NA	12	3	1	0	NA	NA	NA	1	2	3	3	2	2	0	NA	NA
2	3	2	NA	NA	19	1	2	8	NA	NA	NA	4	6	0	1	4	8	NA	NA	NA
3	0	1	NA	NA	5	0	1	4	NA	NA	NA	0	0	3	1	9	NA	NA	NA	NA
4	0	0	NA	NA	0	0	1	0	NA	NA	NA	0	0	0	0	NA	NA	NA	NA	NA
5	0	0	NA	NA	0	0	0	0	NA	NA	NA	0	0	0	NA	NA	NA	NA	NA	NA

Table 8.4.15 Number of tagged **wild** salmon recaptured in the **coastal driftnet fishery**. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	0	0	NA	NA	0	0	0	0	NA	NA	NA	0	0	2	0	0	0	0	NA	NA
1	0	0	NA	NA	0	0	4	0	NA	NA	NA	0	1	0	0	0	2	NA	NA	NA
2	0	1	NA	NA	1	0	0	0	NA	NA	NA	0	0	0	1	0	NA	NA	NA	NA
3	0	0	NA	NA	2	0	0	0	NA	NA	NA	0	0	0	0	NA	NA	NA	NA	NA
4	0	0	NA	NA	0	0	0	0	NA	NA	NA	0	0	0	NA	NA	NA	NA	NA	NA
5	0	0	NA	NA	0	0	0	0	NA	NA	NA	0	0	NA	NA	NA	NA	NA	NA	NA

Table 8.4.16 Number of tagged **wild** salmon recaptured in the **offshore driftnet fishery**. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0.5	0	2	NA	NA	1	1	1	2	NA	NA	NA	1	1	3	3	0	1	0	0	NA
1.5	11	65	NA	NA	86	15	18	84	NA	NA	NA	11	59	32	29	62	39	8	NA	NA
2.5	5	12	NA	NA	26	3	9	5	NA	NA	NA	8	20	6	24	26	0	NA	NA	NA
3.5	0	2	NA	NA	2	0	1	4	NA	NA	NA	5	3	0	3	5	NA	NA	NA	NA
4.5	1	1	NA	NA	5	0	1	2	NA	NA	NA	2	1	5	0	NA	NA	NA	NA	NA

Table 8.4.17 Number of tagged **wild** salmon recaptured in the **offshore longline fishery**. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0.5	0	0	NA	NA	0	0	0	0	NA	NA	NA	0	0	1	3	0	1	4	0	NA
1.5	2	7	NA	NA	10	5	0	28	NA	NA	NA	2	12	3	50	29	71	0	NA	NA
2.5	0	1	NA	NA	0	0	1	4	NA	NA	NA	5	1	12	12	34	14	NA	NA	NA
3.5	0	1	NA	NA	0	0	0	0	NA	NA	NA	0	1	4	2	1	NA	NA	NA	NA
4.5	1	0	NA	NA	1	0	0	1	NA	NA	NA	1	0	2	0	NA	NA	NA	NA	NA

Table 8.4.18 Number of tagged **wild** salmon recaptured in the **river fishery**. The year of recapture indicates the number of years after release the tagged salmon have been recaptured.

Recapture Year	Release year																			
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0	0	1	NA	NA	0	0	0	0	NA	NA	NA	0	0	0	0	0	0	0	0	NA
1	0	0	NA	NA	0	0	0	1	NA	NA	NA	0	1	4	3	2	6	8	NA	NA
2	0	0	NA	NA	1	0	0	3	NA	NA	NA	1	4	2	5	0	6	NA	NA	NA
3	0	0	NA	NA	0	0	0	3	NA	NA	NA	1	2	2	0	2	NA	NA	NA	NA
4	0	0	NA	NA	0	0	0	0	NA	NA	NA	0	0	0	0	NA	NA	NA	NA	NA
5	0	0	NA	NA	0	0	0	1	NA	NA	NA	0	0	0	NA	NA	NA	NA	NA	NA

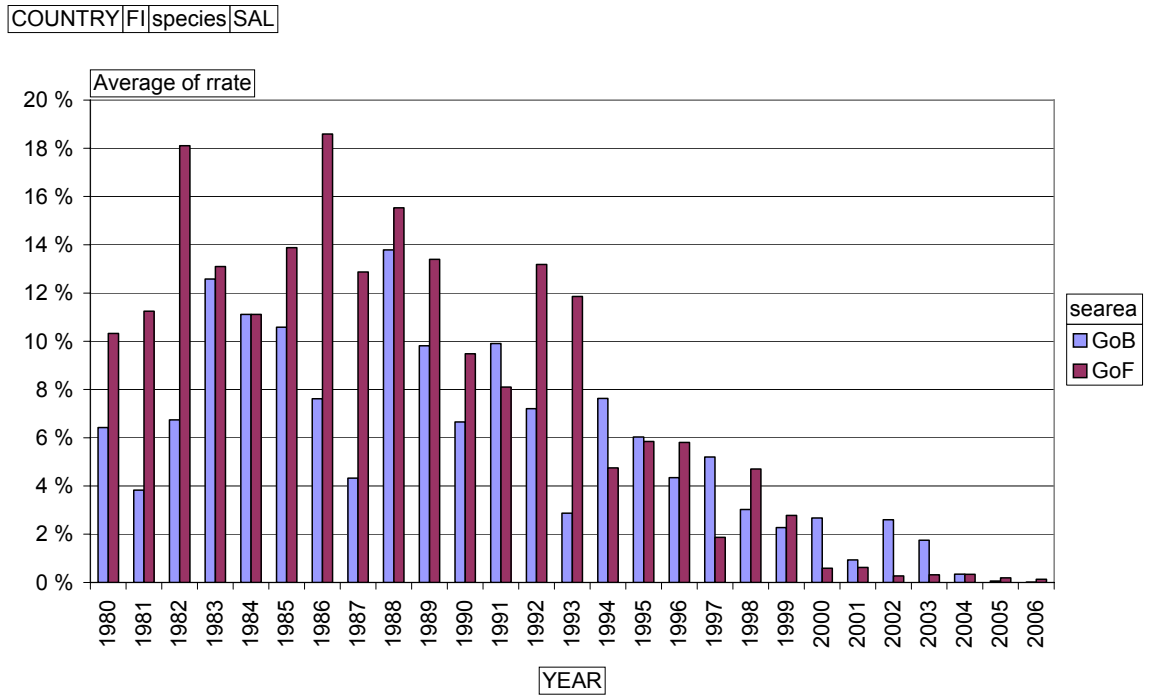


Figure 8.1.1 Return rates of Carling tagged salmon released in Gulf of Bothnia and Gulf of Finland in 1980-2006.

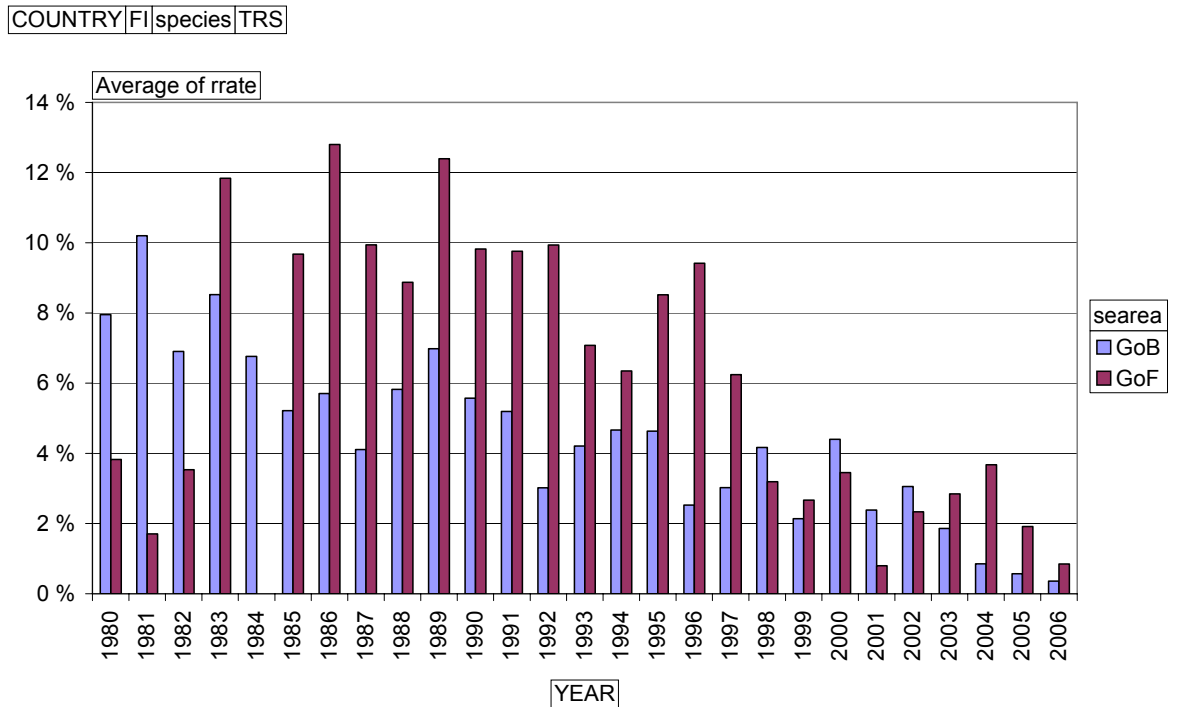


Figure 8.1.2. Return rates of Carling tagged sea trout released in Gulf of Bothnia and Gulf of Finland in 1980-2006.

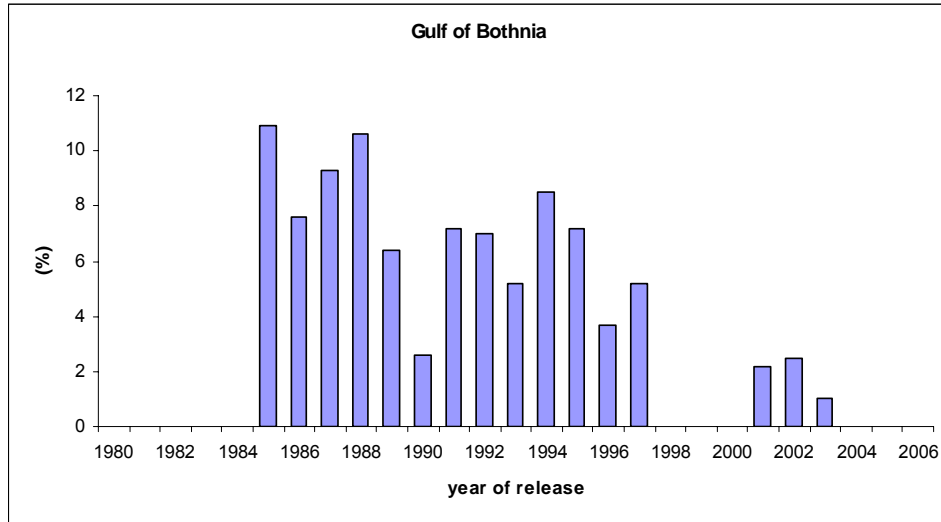


Figure 8.1.3 Recapture rate of the Swedish tagged salmon in Gulf of Bothnia in 1980-2006

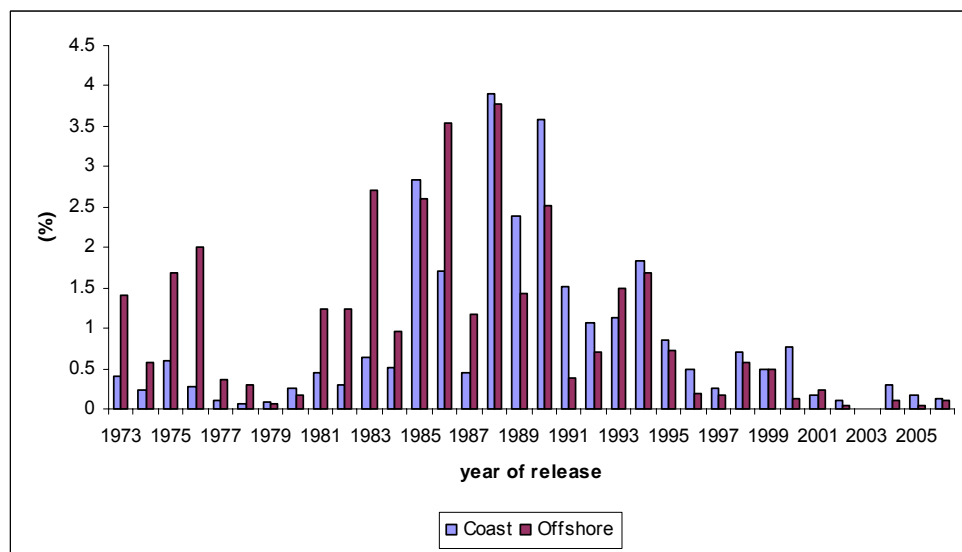


Figure 8.1.4 Recapture rate of Latvian tagged salmon released in Baltic Main Basin in 1973-2006

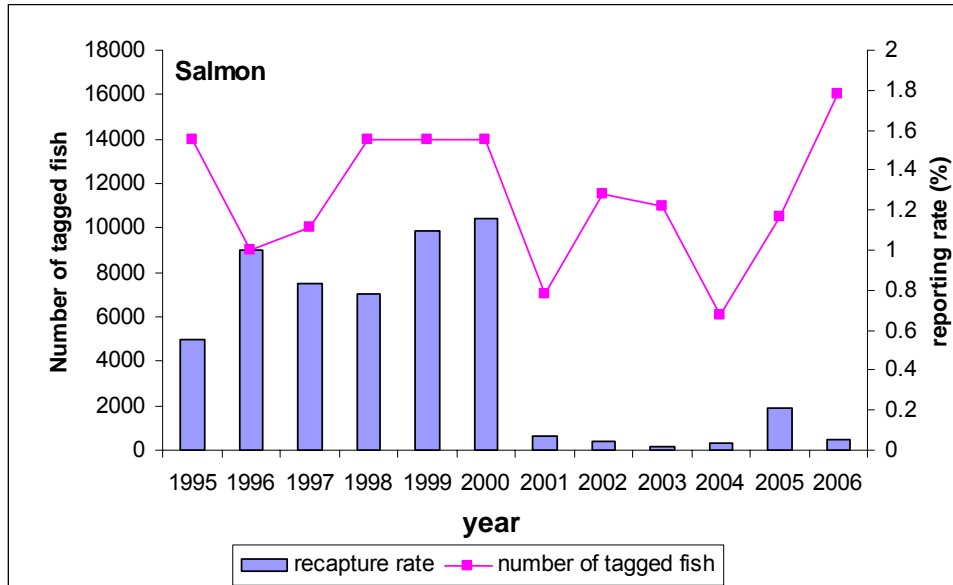


Figure 8.1.5 Recapture rate of Polish salmon released in Baltic Main Basin in 1995-2006

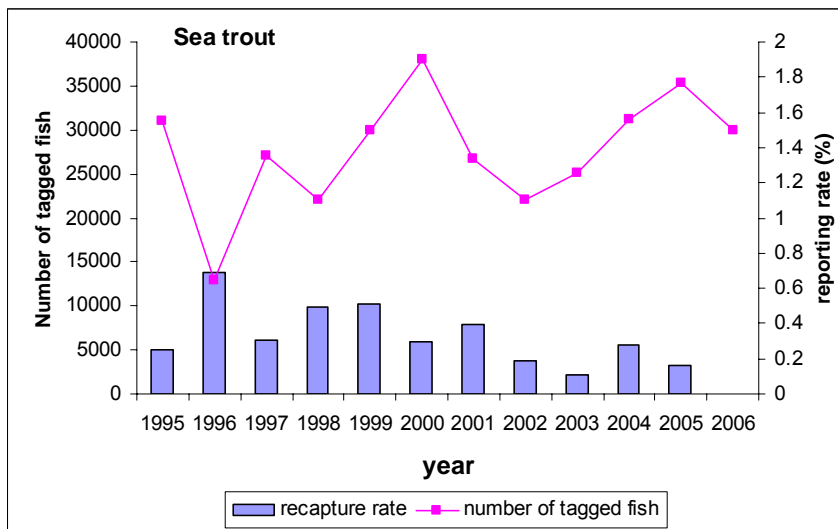


Figure 8.1.6 Recapture rate of Polish sea trout released in Baltic Main Basin in 1995-2006