

## 7 Sea Trout

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### 7.1 Nominal catch

The total sea trout catch in the Baltic Sea was 826 tonnes in 2006 and was just 20 t lower than in 2005. Catches of sea trout increased from 200 t in 1979 to 1,865 t in 1993 and have since then, except for the years 1996-1997 and 2005, been at a level of 1,000-1,300 tons, however, during 2000–2006 a decreasing trend is continued (Tables 7.1.1 and 7.1.2).

The Main Basin is still the most important area for sea trout catches. Total catches in 2006 have decreased from 1,023 t in 2002 to 653 t in 2006. Out of them 80% was caught by Poland. Catches in the Gulf of Bothnia since 1996-1998 were at the level of 200 -300 tons until 2001, since then are decreasing to the level of 120-130 t. In the Gulf of Finland catches decreased from 100-150 tons in years 1996-1999 to only 30-40 tons in 2002-2006 (Tables 7.1.1 and 7.1.2).

#### 7.1.1 Sampling of sea trout

Sampling strategies and procedures for sea trout are very similar to those of salmon and follow those described in section 3.6.

### 7.2 Status of wild and mixed sea trout populations

#### 7.2.1 Gulf of Bothnia

Sea trout populations existed previously in numerous small rivers and brooks and in most salmon rivers. Sea trout smolt production was estimated to be 10–20% of salmon smolt production in most salmon rivers. Presently total of 56 rivers and brooks are in Gulf of Bothnia, of which 25 are wild and 31 are mixed sea trout populations (table 7.2.1.3).

Status of Swedish rivers (total of 51) is very uncertain. Out of five Finnish rivers status of three of them is bad.

Population disappearance has partly been caused by human activities affecting freshwater habitats of sea trout, mostly by damming, dredging, pollution and siltation of rivers (Table 7.2.1.5).

It is also obvious that many small populations have been depleted or are threatened by a very effective gill net fishery during feeding and spawning migration in the sea.

Carlin tagging results of the northern populations in the Gulf of Bothnia show a large proportion and often the majority of the sea trout to be caught during the first year in sea as by-catch in the whitefish fishery by gill nets and fyke nets. Based on the tagging data, the proportion of fish caught undersized during the first sea year is still increasing even though the total effort of gill net fishery by professional fishermen has not changed during past ten years (Figures 7.1.2.1, 7.1.2.2 and 7.1.2.3). In the Gulf of Bothnia sea trout become mature mainly at the age of 3WS (>55 cm). According to the tagging data less than 5 % of the catch has been 3SW or older fish in the last 15 years. Particularly the gillnet fishing effort in the Finnish side of the Gulf has increased in the last 15 years. In addition, the development of the net materials has improved the catchability of gillnets, especially for the youngest age groups. The Finnish sea trout migrate partly to the Swedish side of the Gulf of Bothnia (ICES 2004). The Finnish tagging data indicate about 15% of the tags being caught at the Swedish coast. Correspondingly Swedish sea trout have been caught at the Finnish coast (about 20 tag recoveries annually in the last few years). In some rivers even angling of sea trout parr as

local brown trout may decrease parr and smolt production considerably. Knowledge of the status of the remaining populations is limited. Anyhow, all available data indicate that the most of the populations in the northern part of sub-division 31 are so small that only a few spawners enter these rivers annually.

The results of the electro fishing surveys from year 2003 to 2006 indicate a highly decreasing density of parr thus a precarious state for sea trout stocks on the Swedish side of the Gulf of Bothnia (sub-division 31), on the Finnish side of the Gulf of Bothnia (sub-divisions 30 and 31) and in the Gulf of Finland (sub-division 32) (Table 7.2.1.1 and 7.2.1.2). Apart from the river Tornionjoki the densities of 0+ parr in the remaining wild populations were in many cases either zero or close to zero. Also in the Tornionjoki the density of 0+ parr has since 2003 fallen to the same low level as prevailing in the other rivers (Table 7.2.1.1). The main reason to the precarious state of wild populations is too intensive fishery, largery as by-catch in gillnet fishing for whitefish, but also in some rivers also the poor quality of rearing habitat and restricted access to the spawning habitats.

Estimates of the historical annual wild smolt production in Sub-divisions 30 and 31 ranges between 120,000–170,000 individuals, but present smolt production is assumed to be much lower. Smolt trapping results from River Tornionjoki in 2004 suggested that the wild trout production was about 12,000 smolts in the whole river system. Usually, it is difficult to carry out representative smolt trappings in this region because of the early migration of trout smolts often coincide with harsh winter conditions.

## 7.2.2 Gulf of Finland

The situation of the sea trout populations in the Gulf of Finland is similar to that in the Gulf of Bothnia. There are 100 rivers and brooks in this region (Table 7.2.1.3 and Table 7.2.1.4), out of them 84 are considered as having wild stocks. The rest is supported by releases.

Status of populations in 32 rivers is unknown and status of 17 is very bad.

Main factors influencing the status of stocks are overexploitation and habitat degradation (Table 7.2.1.5 and 7.2.1.6). Another factor is that offshore fishery takes part of the fish before they have reached maturity. The natural reproduction is about 5,000 two-years-old trout per year (ICES 2003). Assuming that all reproduction areas in the present rivers are used, the total production capacity of all rivers could be of 100,000-150,000 two-years-old trout smolts annually.

The only available information on parr densities of sea trout in the Finnish rivers of the Gulf of Finland shows 4-38 individuals per 100 m<sup>2</sup> (Table 7.2.1.2).

The production of wild smolts in Estonian rivers was estimated a few years ago for around 60,000 smolts and in last decades has been decreasing, however, in 2006 was in similar level as in 2005.

Sea trout populations exist in 41 Estonian rivers and brooks in the Gulf of Finland region out of them 32 have wild populations (Table 7.2.1.3). Parr densities in Estonian rivers in 1996–2006 varied from 0 to 98 0+ parr and from 0 to 54 1+ parr per 100 m<sup>2</sup>. The highest 0+ parr densities in 2006 were observed in river Pada (Table 7.2.2.1). Rivers with higher smolt production are situated in the central part of the North Estonian coast.

Also in the Gulf of Finland sea trout are partly migrating to the other countries' coast. Finnish tagging results show about 5-10% of the tag recoveries being returned from Estonia and some also from Russia. Correspondingly Estonian tagged sea trout has partly been recaptured at the Finnish coast.

The wild sea trout populations in the Finnish part of the Gulf of Finland are in very poor condition (Table 7.2.1.3). The main threat is a high exploitation rate in the gillnet fishery, including by-catches in the effective whitefish and pikeperch fishery in the Gulf of Finland. The age structure of the catch has changed so that the proportion of the young age groups has during last ten years considerably increased. To protect the sea trout populations, regional and/or local fisheries regulations should be carried out in order to decrease the exploitation. Also enhancement activities are necessary.

Sea trout is the protected species in the Russian waters discharging to Gulf of Finland. Sea trout populations exist at least in 47 Russian rivers or streams (Table 7.2.1.3 and Table 7.2.1.4). Out of 22 rivers with known status 12 of them is in poor state mainly due to human activity (Table 7.2.1.5 and Table 7.2.1.6). The majority of sea-trout rivers and brooks are situated in the north cost of Gulf of Finland, but the rivers with higher smolt production are situated in opposite, south side of the area. The total smolt production was estimated as minimum as 10,000-15,000 smolts. The recent experiments with smolt traps revealed that from 2,500 to 8,000 sea trout smolts of natural origin migrated to the sea from the largest Russian trout river Luga annually. All of the rivers have original sea trout populations, but in cases of the rivers Vruda and Sista there are mixed populations. The recent information on parr densities of sea trout in the Russian rivers of the Gulf of Finland shows up to 90 individuals per 100 m<sup>2</sup> (Table 7.2.2.2).

### 7.2.3 Main Basin

In the Main Basin there are 773 rivers and streams supporting sea trout populations out of them 381 are wild.

The status of sea trout populations is known in 381 and unknown in 392 rivers (Table 7.2.1.3 and Table 7.2.1.4). Status of 117 populations is poor, mainly due to habitat degradation and dam building (Table 7.2.1.5 and Table 7.2.1.6).

In Denmark, there are in total 486 small sea trout rivers and brooks. Out of 317 rivers with known status 111 are considered at poor state. The estimated number of wild smolt produced in the Danish rivers has increased with approx. 45% from 145,000 smolt to approx. 215,000 smolt over the last four years. The reasons for this development must be found in a steady increase in water quality and habitat improvement in many Danish rivers.

In Estonia, sea trout occurs in at least 30 rivers and brooks discharging into the Main Basin. All of them are small and have mostly wild populations. The condition of populations in most cases is weak. The Rivers Pidula and Õngu have dams close to the outlet. Below the dams are rearing stations taking water from reservoirs. In the River Pärnu sea trout parr did not occur in 1996–2006. In Estonian rivers, a rough estimate indicates that smolt production is about 5,000.

In Latvia, sea trout exists in 14 rivers and small brooks discharging into the Gulf of Riga and Baltic Main Basin. The Salaca, Gauja and Venta rivers have the highest wild smolt production in Latvia. Sea trout populations were supported by releases of reared fry, parr and smolt mostly into the upper sections of dammed rivers. Wild sea trout parr were monitored by electrofishing surveys. Estimated production in all Latvian rivers in 2005 was about 62,000. The mean density of parr in tributaries of the Salaca River in 2006 was the highest since 1993 (Table 7.2.3.1).

In Sweden there are more than 207 sea trout rivers discharging into the Main Basin. Out of them 200 have natural sea trout populations, and seven were supported by releases. Data on status of most of Swedish rivers are unavailable. In rivers Mörrumsån and Emån, wild smolt production was previously considerably higher, but since 2000 parr densities in River Emån has been low (Table 7.2.3.2). In addition, hybrids between salmon and sea trout were found in

high numbers in these rivers. It is not known if there are many populations of the widely-migrating type in southern Swedish rivers.

In Lithuania there are nine sea trout rivers, six of them belong to the Nemunas drainage basin. In two rivers there are wild populations. Total natural smolt production is estimated to be about 32,000 smolts. The parr densities obtained from electrofishing survey in 2006 ranged from 0 to 15,5 individuals/100 m<sup>2</sup>, in most rivers similar like in 2005 (Table 7.2.3.3).

Most of Polish rivers had bigger population of sea trout than salmon in the past. All Polish sea trout are of the widely-migrating type. Currently they occur in 23 rivers, mainly in Pomerania (10) but also in Vistula R.(4) and Odra R. (7) systems. All are mixed due to stocking for many years.

The most important from commercial point of view is Vistula R. – river commercial catch in 2006 was 9 tons, similar as in 2005 and few times less than few years ago. The difference was caused partly by changes in fishery rights. In other rivers only recreational and brood stock fishery exists – both are on the level of 10 t in total. Spawning areas in all rivers are reduced by many impassable dams. The inventory of spawning nests have been done in few Pomeranian rivers: the numbers of nests were from very few in Drawa R. (Odra) to 400 in Reda R. The density of parr was estimated for only a few sites in Pomeranian rivers (Table 7.2.3.4). Electrofishing on spawning areas of some rivers shows that the densities both 0+ and older parr vary with years but in some places are still very high.

In recent years predators such as cormorants (*Phalacrocorax carbo*) have increased dramatically in the Baltic area. Studies have shown that cormorants can have severe effects on fish stocks (Leopold et al. 1998). Where large cormorant colonies occur in the vicinity of important salmonid rivers, there are good reasons to investigate whether cormorants have a significant negative impact on the stock.

### 7.3 Reared smolt production

In Finland, about half of the releases have been made straight to the coast independent of any rivers. The other half are more or less releases to dammed rivers like in Sweden. The sea trout fishery in the Gulf of Bothnia and in the northern part of the Gulf of Finland therefore primarily exploits feeding fish or fish on their spawning run. Because of continuous releases of hatchery-reared fish, the sea trout fishery is almost independent of natural reproduction. On the other hand, at least the wild sea trout populations in Sub-division 31 are so weak that they do not support any fishery. In the other areas, the situation is better, but there also exist populations, which are near to extinction.

In Finnish rivers spawners are scarce, but the eggs obtained from nature are sufficient to supplement hatchery spawners and to avoid the effects of inbreeding, since smolt production is totally based on reared brood stocks. Enhancement with eggs, fry and parr is conducted yearly into several rivers with natural production (Tables 7.3.1., 7.3.2 and 7.3.3). Stocking with reared sea trout smolts was rather stable during the last years (Table 7.3.3).

In Swedish rivers in the Gulf of Bothnia, the number of spawners varied among rivers but in most of them the number of sea trout spawners was sufficient for brood stock purposes. Stocking with smolts since 80's was on average level of 400,000 - 600,000 smolts (Tables 7.3.2 and 7.3.3).

In Estonia sea trout is produced in two hatcheries: in Ongu (Hiiumaa Island) and in Polula (northern Estonia). The number of spawners obtained was sufficient for rearing in both hatcheries. The production consists mostly of two-year-old smolts which are released into coastal waters. Releases were kept on level of 30,000 until 2003, and then they dropped to level of 20,000 (Tables 7.3.2 and 7.3.3).

All Polish sea trout rivers are dammed and the spawning grounds are small, requiring the sea trout population to be supported by stocking. Juvenile fish are reared from spawners caught in each river separately. Tagging experiments showed that many smolts released to lower parts of Pomeranian rivers stray and their sea trout population can be mixed, though. Yearly there are collected about 2.5 million Vistula sea trout eggs and 5–8 million sea trout eggs from Pomeranian rivers what is enough for rearing purposes. More than 9 million of alevins and fry, and 1.4 million of smolts were released to Polish river in 2006 (Table 7.3.1, 7.3.2 and 7.3.3).

Danmark and Sweden released 400,000 and 170,000 smolts in 2006. Latvian releases since 1999 have increased up to 280,000 in 2006 (Table 7.3.3).

Latvian, Polish and Swedish releases of smolts are carried out in rivers and river mouths, but a majority of Finnish smolts and part of Estonian smolts are released directly into the sea. In the next years also releases in Denmark will take place only in river mouths.

Enhancement releases with eggs, alevins, fry and parr carried out in 2006 will give additional smolt production in 2007-2009 years in whole Baltic Sea (Sub-div 24-32) of 210,000 smolts, of which 145,000 will migrate in 2008 into the Main Basin, mainly (Table 7.3.1). Total number of smolts in 2007 from enhancement releases in past years is estimated to about 140,000 which is a less than in last year but two times less than in the beginning of 2000<sup>th</sup> (Table 7.3.2).

Total number of reared smolts released in sub-div 22-32 in 2006 was 3,920,000 and was a little more than in 2005. Out of this 2,730,000 smolts were released into the Main Basin, 890,000 into the Gulf of Bothnia and 300,000 into the Gulf of Finland (Table 7.3.3).

## **7.4 Recommendations for management actions**

### **7.4.1 Gulf of Bothnia and Gulf of Finland**

The Working Group recommends urgent restrictions for the sea trout fishery, both where trout are caught purposely or as a by-catch. A spatial fishing restriction, minimum mesh size for gillnets and effort limitations should be implemented for the fisheries in the sea and rivers in each region. At present, a ban of nearshore (< 3 m depth) fishing has been enforced in Sweden for Bothnian Bay during spring (1 April – 10 June) and fall (1 October – 31 December) and the minimum size allowed to catch has been increased to 50 cm. In Finland that same size (50 cm) and mesh size (bar length 65 mm) in gill net fishing of sea trout has been enforced off the private near shore waters and in many private waters in the Gulf of Finland. The restoration of rearing habitats and building of new fish ways are recommended. The present situation is very alarming and these populations are considered to be at the risk of extinction. Therefore the Group recommends the national and regional agencies to take immediate actions to safeguard the remaining wild sea trout populations in the region.

At present, the fishing is directed towards to young age groups and the proportion of sea trout caught undersized has increased, i.e. a large portion does not reach sexual maturity. The Group recommends that the minimum size of sea trout should be 65 cm to match the spawning size of female fish and for allowing them to spawn at least once. Adequate fishing regulations should be enforced locally in sub-divisions 29-32 for reducing the fishing mortality of sea trout. Principally the use of mesh sizes 31-49 mm (bar length) should be prohibited to reduce the number of undersized sea trout caught as by-catch in the gill net fishing of whitefish and pikeperch but allowing the fishing of perch and small sized sea spawning whitefish, which are locally important target species. The use of special technical devices such as “escape windows” (a structure provided with large mesh size) in the trapnet fishery could also be promoted. Gill net fishing should be totally prohibited or strictly restricted in the sea trout rivers and at the river mouth. Alternative local and temporal measures for reducing by-catch of

undersized sea trout in the sea fishery are urgently needed. The Swedish regulations enforced in gillnet fishery of the Bothnian Bay serve as an example of such management action.

#### **7.4.2 Main Basin**

The present system of classifying rivers in categories of rivers with poor, satisfactory and good status assumes that there is a transparent and objective manner of dividing rivers into these categories. The working group has adapted national classifications of rivers, without trying to interfere with how the work was carried out. It seems that the different countries have partly incompatible manners of classifying rivers. In particular, while some countries have assumed that all rivers should be able to assume a production at a specified level, other countries have looked at each river in relation to its natural qualifications such as water regime, slope and water quality. In such cases only rivers which have been producing substantially less than assumed have been placed in the category “poor”. This classification system must be improved and standardized if there should be a possibility of good comparisons among countries. This is particularly the case in the Main Basin where most Baltic sea trout rivers are located.

Sea trout can normally be managed on a national level. This means that each nation must take responsibility for protection of sea trout rivers and adopt strategies for the protection and development of sea trout rivers. For example valuable improvements could be achieved by habitat restoration. In addition to this access to spawning and nursery area should be ensured. This strategy should include a list of sea trout rivers where the rearing habitat and migration routes should be protected against negative changes, and activities to implement the strategy.

**Table 7.1.1.** Nominal catches ( in tonnes round fresh weight) of sea trout in the Baltic Sea by country in 1979-2006 in sub-divisions 22-32

Year	Country								Total
	Denmark <sup>1,4</sup>	Estonia	Finland <sup>2</sup>	Germany <sup>4</sup>	Latvia	Lithuania	Poland <sup>9</sup>	Sweden	
1979	3	na	89	na	na	na	105 <sup>3</sup>	3	200
1980	3	na	173	na	na	na	74 <sup>3</sup>	3	253
1981	6	2	310	na	5	na	66 <sup>3</sup>	3	392
1982	17	4	326	1	13	na	111	3	475
1983	19	3	332	na	14	na	133	3	504
1984	29	2	387	na	9	na	185	3	617
1985	40	3	368	na	9	na	166	13	599
1986	18	2	349	na	8	na	140	49	566
1987	31	na	373	na	2	na	200	47	653
1988	28	3	582	na	8	na	170	112	903
1989	39	3	666	18	10	na	184	169	1,089
1990	48 <sup>3</sup>	4	841	21	7	na	488	154	1,563
1991	48 <sup>3</sup>	3	829	7	6	na	309	171	1,373
1992	27 <sup>3</sup>	9	837	na	6	na	281	249	1,409
1993	59 <sup>3</sup>	15	1250 <sup>7</sup>	14	17	na	272	138	1,865
1994	33 <sup>8,3</sup>	8	1,150	15 <sup>8</sup>	18	na	222	161	1,607
1995	69 <sup>8,3</sup>	6	502	13	13	3	262	125	993
1996	71 <sup>8,3</sup>	16	333	6	10	2	240	166	844
1997	53 <sup>8,3</sup>	10	297	+	7	2	280	156	805
1998	60 <sup>8,3</sup>	8	460	4	7	na	468	145	1,158
1999	110	10	440	9	10	1	626	115	1,321
2000	58	14	445	9	14	1	812	99	1,452
2001	54	10	363	10	12	1	716	85	1,252
2002	35	16	196	12	13	2	863	76	1,215
2003	40	9	183	9	6	+	823	65	1,136
2004	46	10	145	12	7	1	764	61	1,045
2005	14	10	159	15	9	2	586	61	855
2006 <sup>5</sup>	44	19	153	12	7	1	530	60	826

<sup>1</sup>Additional sea trout catches are included in the salmon statistics for Denmark until 1982 (table 3.1.2).

<sup>2</sup>Finnish catches include about 70 % non-commercial catches in 1979 - 1995, 50 % in 1996-1997, 75% in 2000-2001.

<sup>3</sup>Rainbow trout included.

<sup>4</sup>Sea trout are also caught in the Western Baltic in Sub-divisions 22 and 23 by Denmark, Germany and Sweden.

<sup>5</sup> Preliminary data.

<sup>6</sup>Catches reported by licensed fishermen and from 1985 also catches in trapnets used by nonlicensed fishermen.

<sup>7</sup>Finnish catches include about 85 % non-commercial catches in 1993.

<sup>8</sup>ICES Sub-div. 22 and 24.

+ Catch less than 1 tonne.

<sup>9</sup>Catches in 1979-1997 included sea and coastal catches

**Table 7.1.2** Nominal catches (in tonnes round fresh weight) of sea trout in the Baltic Sea. S=Sea, C=Coast and R=River.

Year	Baltic Sea														Total Main Basin	Gulf of Bothnia						Total Gulf of Bothnia	Gulf of Finland				Total Gulf of Finland	Grand Total		
	Denmark <sup>1,4</sup>		Estonia	Finland <sup>2</sup>			Germany <sup>4</sup>		Latvia	Lith.		Poland				Sweden <sup>4</sup>			Finland <sup>2</sup>		Sweden		Estonia		Finland <sup>2</sup>					
	S + C	C	S	S + C	R	C	S + C	R	C	R	S <sup>9</sup>	S + C	R	S <sup>6</sup>		C <sup>6</sup>	R	S <sup>6</sup>	C <sup>6</sup>	R	S		C	R	S	C			R	
1979	3	na		10		na	na		na	na	81 <sup>3</sup>	24	na	na	3	121	6	na	na	na	na	6	na	73	0	73	200			
1980	3	na		11		na	na		na	na	48 <sup>3</sup>	26	na	na	3	91	87	na	na	na	na	87	na	75	0	75	253			
1981	6	na		51		na	5		na	na	45 <sup>3</sup>	21	na	na	3	131	131	na	na	na	na	131	2	128	0	130	392			
1982	17	na		52		1	13		na	na	80	31	na	na	3	197	134	na	na	na	na	134	4	140	0	144	475			
1983	19	na		50		na	14		na	na	108	25	na	na	3	219	134	na	na	na	na	134	3	148	0	151	504			
1984	29	na		66		na	9		na	na	155	30	na	na	5	294	110	na	na	na	na	110	2	211	0	213	617			
1985	40	na		62		na	9		na	na	140	26	na	na	13	290	103	na	na	na	na	103	3	203	0	206	599			
1986	18	na		53		na	8		na	na	91	49	7	9	8	243	118	na	1	24	na	143	2	178	0	180	566			
1987	31	na		66		na	2		na	na	163	37	6	9	5	319	123	na	1	26	na	150	na	184	0	184	653			
1988	28	na		99		na	8		na	na	137	33	7	12	7	331	196	na	na	44	42	282	3	287	0	290	903			
1989	39	na		156		18	10		na	na	149	35	30	17	6	460	215	na	1	78	37	331	3	295	0	298	1,089			
1990	48 <sup>3</sup>	na		189		21	7		na	na	388	100	15	15	10	793	318	na	na	71	43	432	4	334	0	338	1,563			
1991	48 <sup>3</sup>	1		185		7	6		na	na	272	37	26	24	7	613	349	na	na	60	54	463	2	295	0	297	1,373			
1992	27 <sup>3</sup>	1		173		na	6		na	na	221	60	103	26	1	618	350	na	na	71	48	469	8	314	0	322	1,409			
1993	59 <sup>3</sup>	1		386		14	17		na	na	202	70	125	21	2	897	160	na	na	47	43	250	14	704 <sup>7</sup>	0	718	1,865			
1994	33 <sup>8,3</sup>	2		384		15 <sup>8</sup>	18		+	na	152	70	76	16	3	769	124	na	na	24	42	190	6	642	0	648	1,607			
1995	69 <sup>8,3</sup>	1		226		13	13		3	na	187	75	44	5	11	647	162	na	na	33	32	227	5	114	0	119	993			
1996	71 <sup>8,3</sup>	2		76		6	10		2	na	150	90	93	2	9	511	151	25	na	20	42	238	14	78	3	95	844			
1997	53 <sup>8,3</sup>	2		44		+	7		2	na	200	80	72	7	7	474	156	12	na	16	54	238	8	82	3	93	805			
1998	60	8		103		4	7		na	208	184	76	88	3	6	747	192	12	0	9	39	252	6	150	3	159	1,158			
1999	110 <sup>8,3</sup>	2		84		9	10		1	384	126	116	51	2	3	898	248	12	0	18	41	319	8	93	3	104	1,321			
2000	58	4		64		9	14		1	443	299	70	42	4	3	1011	197	12	0	14	36	259	10	56	3	69	1,339			
2001	54	2	5	57		10	12		1	486	219	11	23	1	3	884	2	221	7	0	14	44	288	8	68	3	79	1,251		
2002	35	5	2	75		12	13		2	539	272	53	11	1	3	1023	0	78	7	0	23	38	147	11	31	3	45	1,215		
2003	40	2	1	71		9	6		+	583	169	72	3	1	0	958	0	70	11	0	15	30	127	7	27	2	36	1,121		
2004	46	3	1	35	0	12	7		1	606	122	36	9	2	3	883	1	62	11	0	18	29	120	7	0	33	2	43	1,045	
2005	14	4	1	37	0	15	7	1	1	0	480	86	20	5	2	2	675	0	69	11	0	22	31	133	6	0	37	3	46	855
2006 <sup>5</sup>	44	10		40	0	12	7		1	419	94	17	6	2	1	653	1	64	5	0	19	33	121	9	0	40	3	52	826	

<sup>1</sup>Additional sea trout catches are included in the salmon statistics for Denmark until 1982 (table 3.1.2).

<sup>2</sup>Finnish catches include about 70 % non-commercial catches in 1979 - 1995, 50 % in 1996-1997, 75% in 2000-2001.

<sup>3</sup>Rainbow trout included.

<sup>4</sup>Sea trout are also caught in the Western Baltic in Sub-divisions 22 and 23 by Denmark, Germany and Sweden.

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<sup>7</sup>Finnish catches include about 85 % non-commercial catches in 1993.

<sup>8</sup>ICES Sub-div. 22 and 24.

+ Catch less than 1 tonne.

<sup>9</sup>Catches in 1979-1997 included sea and coastal catches, since 1998 coastal (C) and sea (S) catches are registered separately  
na=Data not available

**Table 7.2.1.1** Densities of sea trout parr in electrofishing surveys in Swedish tributaries in the Gulf of Bothnia, Sub-div. 31, in 1982-2006.

River and year	N parr/100 m <sup>2</sup>		Sites with 0+ parr %	Number of sampling sites	River and year	N parr/100 m <sup>2</sup>		Sites with 0+ parr %	Number of sampling sites	River and year	N parr/100 m <sup>2</sup>		Sites with 0+ parr %	Number of sampling sites
	0+	>0+				0+	>0+				0+	>0+		
<b>Torneälven</b> tributaries <sup>1)</sup>					<b>Byskeälven</b> tributaries					<b>Vindelälven</b> tributaries				
1982	1.19	0.25	38	8	1990	4.34	2.14	80	5	1985	0.20	11.0	33	3
1983	0.54	1.89	28	18	1991	27.20	18.50	100	1	1986	23.6	10.6	100	3
1984	0.19	1.65	16	19	1992	1.32	0.62	60	5	1987	15.6	9.80	100	2
1985	na	na			1993	0.84	1.32	60	5	1988	42.2	28.5	100	2
1986	1.06	1.56	23	13	1994	0.99	1.14	42	7	1989	4.40	39.2	100	1
1987	0.10	1.61	13	15	1995	1.74	1.14	60	5	1990	3.31	6.91	57	7
1988	0.00	0.62	0	13	1996	0.12	0.64	20	5	1991	12.98	9.11	86	14
1989	0.38	0.59	31	13	1997	0.00	0.62	0	5	1992	27.2	65.5	57	7
1990	2.64	1.02	38	13	1998	1.60	1.25	50	4	1993	26.9	13.3	87	8
1991	6.53	2.57	31	13	1999	1.86	0.98	40	5	1994	21.4	15.0	75	12
1992	1.17	5.83	36	25	2000	0.75	1.00	50	4	1995	1.56	16.6	75	8
1993	1.04	1.76	40	15	2001	1.30	2.72	60	5	1996	11.3	11.0	50	4
1994	1.68	2.81	40	15	2002	0.40	0.72	40	5	1997	12.2	11.6	89	9
1995	0.36	1.74	29	28	2003	0.65	0.20	67	6	1998	8.58	11.9	50	6
1996	0.62	1.61	24	29	2004	na	na			1999	44.3	13.1	100	7
1997	0.66	0.00	27	15	2005	14.30	1.66	60	5	2000	4.69	17.7	63	8
1998	2.03	1.02	43	30	2006	0.80	5.20	27	11	2001	26.5	9.39	100	7
1999	5.89	1.46	59	37	<b>Kågeälven</b> tributaries					2002	66.2	14.2	100	6
2000	3.82	0.00	54	24	1989	0.00	6.80	0	2	2003	0.59	13.3	25	8
2001	8.50	2.78	57	23	1990	na	na			2004	15.4	4.06	89	9
2002	4.73	7.26	57	37	1991	1.13	1.08	25	4	2005	2.35	0.00	100	2
2003	11.07	9.55	64	36	1992	na	na			2006	7.90	9.80	53	47
2004	1.33	4.50	29	38	1993	na	na			<b>Öreälven</b> tributaries				
2005	3.14	4.40	39	38	1994	0.65	7.55	75	4	1985	1.20	2.10	50	2
<b>Kalixälven</b> tributaries					1995	0.00	14.2	0	2	1986	0.00	3.85	0	2
1986	0.40	1.70	50	2	1996	0.00	0.40	0	2	1987	0.00	5.25	0	2
1987	0.10	0.65	50	2	1997	0.00	0.00	0	2	1988	0.50	6.55	50	2
1988	0.00	0.00	0	1	1998	na	na			1989	0.27	5.17	33	3
1989	0.15	2.33	0	3	1999	1.57	5.83	67	3	1990	1.58	4.34	60	5
1990	0.70	0.70	50	2	2000	na	na			1991	0.58	6.28	40	5
1991	0.16	4.64	20	5	2001	0.00	2.80	0	1	1992	1.46	6.94	60	5
1992	0.00	1.50	0	4	2002	na	na			1993	1.94	6.06	80	5
1993	0.23	0.20	33	3	2003	na	na			1994	2.68	15.5	40	5
1994	0.35	1.65	50	2	2004	na	na			1995	0.80	9.88	75	4
1995	0.18	0.93	75	4	2005	70	1.15	50	2	1996	56	2.75	25	4
1996	0.43	0.45	75	4	<b>Rickleån</b> tributaries					1997	1.46	11.5	20	5
1997	0.18	0.95	33	12	1989	222	36.2	100	1	1998	0.00	7.60	0	5
1998	0.38	0.55	67	6	1990	na	na			1999	1.12	3.46	60	5
1999	1.09	1.02	29	17	1991	8.00	4.60	100	2	2000	4.74	3.30	60	5
2000	0.78	1.08	67	12	1992	19.8	5.20	100	2	2001	5.24	6.92	60	5
2001	0.85	0.98	63	24	1993	5.83	4.10	100	3	2002	12.3	3.72	60	5
2002	2.30	1.46	78	27	1994	33.4	16.2	100	2	2003	7.92	7.12	80	5
2003	4.51	2.13	90	39	1995	21.9	10.0	100	1	2004	4.03	7.18	100	4
2004	1.27	1.16	44	16	1996	0.00	0.00	0	2	2005	2.70	5.55	100	2
2005	2.54	1.23	100	17	1997	13.8	0.35	100	2	2006	13.80	23.50	65	20
2006	8.70	7.10	84	19	1998	16.6	7.55	50	2	<b>Lögdeälven</b> tributaries				
<b>Råneälven</b> tributaries					1999	35.2	5.00	50	2	1984	3.26	21.1	60	5
1986	0.07	0.00	33	3	2000	1.50	7.80	50	2	1985	2.53	4.25	75	4
1991	0.00	49.4	0	1	2001	na	na			1986	24.3	7.43	71	7
1992	na	na			2002	28.6	17.5	100	2	1987	23.2	18.2	100	6
1993	na	na			2003	26.0	7.10	50	2	1988	23.7	17.5	86	7
1994	na	na			2004	20.6	1.95	50	2	1989	22.3	4.73	75	8
1995	0.26	4.10	13	8	2005	na	na			1990	12.9	13.2	69	13
1996	0.00	0.00	0	6	2006	19.5	18.1	58	19	1991	14.4	15.9	73	15
1997	0.00	0.00	0	6	<b>Sävarån</b> tributaries					1992	55.7	20.8	65	20
1998	0.00	0.35	0	2	1987	0.45	4.45	67	6	1993	19.2	17.1	82	17
1999	0.19	0.00	25	8	1988	29.6	8.30	67	3	1994	70.8	33.2	86	21
2000	0.04	0.38	10	12	1989	11.3	12.8	60	10	1995	9.31	15.9	63	16
2001	2.53	1.92	33	9	1990	4.35	12.0	55	11	1996	7.22	6.91	57	14
2002	0.76	0.45	45	11	1991	15.3	10.5	62	13	1997	64.2	7.52	80	20
2003	na	na			1992	15.5	13.9	69	13	1998	14.9	16.2	75	20
2004	0.10	0.02	20	5	1993	5.82	11.1	57	14	1999	45.0	24.8	95	21
2005	0.10	0.10	50	2	1994	5.91	11.8	50	14	2000	6.95	21.7	76	21
2006	0.00	0.20	0	3	1995	4.66	15.4	36	14	2001	13.8	15.2	91	22
<b>Piteälven</b> tributaries					1996	2.21	4.78	60	10	2002	33.8	13.8	91	23
2002	1.44	0.50	57	7	1997	7.15	9.12	47	15	2003	13.9	15.0	50	20
2003	1.81	1.05	53	13	1998	1.98	5.13	42	12	2004	56.7	7.87	91	23
2004	0.40	0.87	15	13	1999	16.2	8.24	85	13	2005	56.0	19.0	93	28
2005	1.29	0.66	69	13	2000	5.63	8.54	77	13	2006	17.8	16.3	83	53
2006	2.50	1.50	31	16	2001	8.01	6.80	90	10					
<b>Åbyälven</b> tributaries					2002	17.9	16.6	92	12					
1990	0.00	0.20	0	2	2003	5.59	11.6	92	13					
1991	0.65	5.98	25	4	2004	6.87	9.01	64	14					
1992	9.12	2.26	60	5	2005	na	na							
1993	0.30	9.50	20	5	2006	11.1	21.1	65	34					
1994	4.55	8.20	50	4										
1995	0.00	5.00	0	1										
1996	0.00	0.00	0	4										
1997	0.00	1.18	0	4										
1998	na	na												
1999	6.35	6.73	75	4										
2000	0.50	2.28	50	4										
2001	1.47	3.13	100	3										
2002	1.22	0.58	50	6										
2003	0.00	2.03	0	3										
2004	na	na												
2005	5.48	1.40	50	6										
2006	1.90	5.70	50	6										

<sup>1)</sup> Finnish and Swedish sites combined

**Table 7.2.1.2.** Density of 0+ sea trout parr (individuals/100 m<sup>2</sup>) in Finnish rivers.

<b>Sub-division 31</b>				<b>Sub-division 30</b>		<b>Sub-division 32</b>	
Year	<b>Pakajoki*</b>	<b>Äkäsjoki*</b>	<b>Lestijoki</b>	Year	<b>Isojoki</b>	Year	<b>Ingarskilanjoki</b>
1989	0.1	0.7	-	1995	1	2001	9.4
1990	3.2	5.5	0.1	1996	7.5	2002	13.6
1991	5.3	3.4	0.2	1997	7.6	2003	0
1992	4.6	1.1	0.4	1998	2.9	2004	0.2
1993	3.3	1.7	1.1	1999	4.9	2005	13.6
1994	0	4.6	0.1	2000	2.7	2006	33.5
1995	0	0	0	2001	2.7		
1996	0	0	0	2002	11.8		
1997	1.2	0.7	0	2003	1.4		
1998	0.7	4.2	0	2004	2.6		
1999	3.6	16.6	0	2005	1.3		
2000	7.7	2.1	0.2	2006	3.78		
2001	19.7	6.8	0.1				
2002	13	4.9	1				
2003	26.7	15.4	0.1				
2004	2.7	1.5	0.2				
2005	4	7.7	1.1				
2006	2.6	2.8	0				

\* Tributaries of Tornionjoki

Table 7.2.1.3 Status of wild and mixed sea trout populations in 2006

Area	Country	Potential smolt production (x1000)	Smolt production (% of potential production)								Total		
			<5 %		5-50 %		> 50 %		Uncertain		wild	mixed	
			wild	mixed	wild	mixed	wild	mixed	wild	mixed	wild	mixed	
Gulf of Bothnia	Finland	< 1	0	0	0	0	0	0	0	0	0	0	0
		1-10	0	3	0	1	0	0	0	0	0	0	4
		11-100*	0	0	0	1	0	0	0	0	0	0	1
		> 100	0	0	0	0	0	0	0	0	0	0	0
		Uncertain	0	0	0	0	0	0	0	0	0	0	0
	Total		0	3	0	2	0	0	0	0	0	0	5
	Sweden	< 1	0	0	0	0	0	0	0	0	0	0	0
		1-10	0	0	0	0	0	0	0	0	0	0	0
		11-100	0	0	0	0	0	0	0	0	0	0	0
		> 100	0	0	0	0	0	0	0	0	0	0	0
Uncertain		0	0	0	0	0	0	0	25	26	25	26	
Total		0	0	0	0	0	0	0	25	26	25	26	
Total		0	3	0	2	0	0	0	25	26	25	31	
Gulf of Finland	Estonia	< 1	0	0	14	4	1	0	5	0	20	4	4
		1-10	0	0	5	1	7	4	0	0	12	5	5
		11-100	0	0	0	0	0	0	0	0	0	0	0
		> 100	0	0	0	0	0	0	0	0	0	0	0
		Uncertain	0	0	0	0	0	0	0	0	0	0	0
	Total		0	0	19	5	8	4	5	0	32	9	9
	Finland	< 1	2	2	0	0	0	0	0	0	2	2	2
		1-10	1	0	1	2	0	0	0	0	2	2	2
		11-100	0	0	0	2	0	0	0	0	0	0	2
		> 100	0	0	0	0	0	0	0	0	0	0	0
Uncertain		0	0	0	0	0	0	1	0	1	0	0	
Total		3	2	1	4	0	0	1	0	5	6	6	
Russia	< 1	0	0	2	0	2	0	2	0	6	0	0	
	1-10	7	0	2	0	0	0	2	0	11	0	0	
	11-100*	1	1	1	0	0	0	0	0	2	1	1	
	> 100	0	0	0	0	0	0	0	0	0	0	0	
	Uncertain	0	0	0	0	0	0	21	0	21	0	1	
Total		8	1	5	0	2	0	25	0	40	1	1	
Total		11	3	25	9	10	4	31	0	77	16	16	
Main Basin	Denmark	< 1	4	100	25	28	56	15	27	142	112	285	
		1-10	1	6	5	4	14	46	0	0	20	56	
		11-100	0	0	1	1	1	10	0	0	2	11	
		> 100	0	0	0	0	0	0	0	0	0	0	
		Uncertain	0	0	0	0	0	0	0	0	0	0	
	Total		5	106	31	33	71	71	27	142	134	352	
	Estonia	< 1	3	0	12	0	1	0	8	0	24	0	
		1-10	0	0	1	0	5	0	0	0	6	0	
		11-100	0	0	0	0	0	0	0	0	0	0	
		> 100	0	0	0	0	0	0	0	0	0	0	
		Uncertain	0	0	0	0	0	0	0	0	0	0	
	Total		3	0	13	0	6	0	8	0	30	0	
	Latvia	< 1	0	0	0	0	0	0	0	0	0	0	
		1-10	0	0	0	0	1	0	0	0	1	0	
		11-100	0	0	11	2	0	0	0	0	11	2	
		> 100	0	0	0	0	0	0	0	0	0	0	
		Uncertain	0	0	0	0	0	0	0	0	0	0	
	Total		0	0	11	2	1	0	0	0	12	2	
	Lithuania	< 1	0	0	0	0	0	0	0	0	0	0	
		1-10	0	0	0	2	0	0	0	0	0	2	
		11-100	0	1	0	0	0	0	0	0	0	1	
		> 100*	0	0	0	1	0	0	0	0	0	1	
		Uncertain	0	0	0	0	0	0	0	0	0	0	
	Total		0	1	0	3	0	0	0	0	0	4	
	Poland	< 1	0	1	0	1	0	4	0	0	0	6	
		1-10	0	0	0	1	0	2	0	0	0	3	
11-100*		0	0	0	4	0	1	0	0	0	5		
> 100		0	0	0	0	0	0	0	0	0	0		
Uncertain		0	0	0	0	0	0	0	0	0	0		
Total		0	1	0	6	0	7	0	0	0	14		
Russia	< 1	0	0	0	0	0	0	0	0	0	0		
	1-10	0	0	0	0	0	0	0	0	0	0		
	11-100	0	0	0	0	0	0	0	0	0	0		
	> 100	0	0	0	0	0	0	0	0	0	0		
	Uncertain	0	0	0	0	0	0	3	0	3	0		
Total		0	0	0	0	0	0	3	0	3	0		
Sweden	< 1	0	0	0	0	0	0	0	0	0	0		
	1-10	0	0	0	0	0	0	0	0	0	0		
	11-100	0	0	0	0	0	0	0	0	0	0		
	> 100	0	0	0	0	0	0	0	0	0	0		
	Uncertain	0	0	0	0	0	0	200	7	200	7		
Total		0	0	0	0	0	0	200	7	200	7		
Total		8	108	55	44	78	78	238	149	379	379		
Grand total		19	114	80	55	88	82	294	175	481	426		

\* includes large river systems, see Table 7.2.1.4.

Table 7.2.1.4 Status of wild and mixed sea trout populations in large river systems in 2006

Country	River (Area)	Potential smolt production (x1000)	Smolt production (% of potential production)										
			<5 %		5-50 %		> 50 %		Uncertain		Total		
			wild	mixed	wild	mixed	wild	mixed	wild	mixed	wild	mixed	
Lithuania	Nemunas (Main Basin)	< 1	0	0	0	0	0	0	0	0	0	0	0
		1-10	0	0	0	0	0	0	0	0	0	0	0
		11-100	1	0	1	3	0	1	0	0	2	4	
		> 100	0	0	0	0	0	0	0	0	0	0	0
		Uncertain	0	0	0	0	0	0	0	0	0	0	0
Total		1	0	1	3	0	1	0	0	2	4		
Poland	Odra (Main Basin)	< 1	0	0	0	2	0	0	0	3	0	5	
		1-10	0	0	0	2	0	0	0	0	0	2	
		11-100	0	0	0	0	0	0	0	0	0	0	
		> 100	0	0	0	0	0	0	0	0	0	0	
		Uncertain	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	4	0	0	0	3	0	7		
Poland	Vistula (Main Basin)	< 1	0	0	0	1	0	0	0	2	0	3	
		1-10	0	0	0	1	0	0	0	0	0	1	
		11-100	0	0	0	0	0	0	0	0	0	0	
		> 100	0	0	0	0	0	0	0	0	0	0	
		Uncertain	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	2	0	0	0	2	0	4		
Russia	Luga (Gulf of Finland)	< 1	1	0	1	0	0	0	0	0	2	0	
		1-10	1	0	1	0	0	0	0	0	2	0	
		11-100	1	0	1	0	0	0	0	0	2	0	
		> 100	0	0	0	0	0	0	0	0	0	0	
		Uncertain	0	0	0	0	0	0	1	0	1	0	
Total		3	0	3	0	0	0	1	0	7	0		
Finland	Tornionjoki (Gulf of Bothnia)	< 1	0	0	0	0	0	0	0	0	0	0	
		1-10	1	4	2	0	0	0	0	0	3	4	
		11-100	1	0	0	1	0	0	0	0	1	1	
		> 100	0	0	0	0	0	0	0	0	0	0	
		Uncertain	0	0	0	0	0	0	0	0	0	0	0
Total		2	4	2	1	0	0	0	0	4	5		

Table 7.2.1.5 Factors influencing status of sea trout populations

Area	Country	Potential smolt production (x1000)	Number of populations					
			Overexploitation	Habitat degradation	Dam building	Pollution	Other	No influence
Gulf of Bothnia	Finland	< 1	0	0	0	0	0	0
		1-10	4	4	2	1	0	0
		11-100	1	1	0	0	0	0
		> 100	0	0	0	0	0	0
		Uncertain	0	0	0	0	0	0
	Total	5	5	2	1	0	0	
Total			5	5	2	1	0	0
Gulf of Finland	Finland	< 1	4	4	4	0	0	0
		1-10	4	2	2	1	0	0
		11-100	2	2	1	0	0	0
		> 100	0	0	0	0	0	0
		Uncertain	0	1	1	0	0	0
	Total	10	9	8	1	0	0	
	Russia	< 1	4	5	0	3	0	0
		1-10	11	9	2	7	0	0
		11-100	3	3	1	3	0	0
		> 100	0	0	0	0	0	0
Uncertain		12	11	3	9	0	0	
Total	30	28	6	22	0	0		
Total			40	37	14	23	0	0
Main Basin	Lithuania	< 1	0	0	0	0	0	0
		1-10	0	2	2	1	0	0
		11-100	0	1	1	1	0	0
		> 100*	0	1	1	1	1	0
		Uncertain	0	0	0	0	0	0
	Total	0	4	4	3	1	0	
	Poland	< 1	2	3	3	1	0	0
		1-10	2	2	3	0	0	0
		11-100*	2	3	5	2	0	0
		> 100	0	0	0	0	0	0
		Uncertain	0	0	0	0	0	0
	Total	6	8	11	3	0	0	
	Russia	< 1	0	0	0	0	0	0
		1-10	0	0	0	0	0	0
		11-100	0	0	0	0	0	0
> 100		0	0	0	0	0	0	
Uncertain		3	2	0	2	0	0	
Total	3	2	0	2	0	0		
Total			9	14	15	8	1	0
Grand total			54	56	31	32	1	0

\* includes large river systems, see Table 7.2.1.6.

**Table 7.2.1.6 Factors influencing status of sea trout populations in large river systems**

Country	River	Potential smolt production (x1000)	Number of populations					
			Overexploitation	Habitat degradation	Dam building	Pollution	Other	No influence
Lithuania	Nemunas (Main Basin)	< 1	0	0	0	0	0	0
		1-10	0	0	0	0	0	0
		11-100	0	2	6	1	1	0
		> 100	0	0	0	0	0	0
		Uncertain	0	0	0	0	0	0
Total		0	2	6	0	1	0	
Poland	Odra (Main Basin)	< 1	5	3	3	4	0	0
		1-10	2	1	2	1	0	0
		11-100	0	0	0	0	0	0
		> 100	0	0	0	0	0	0
		Uncertain	0	0	0	0	0	0
Total		7	4	5	5	0	0	
Poland	Vistula (Main Basin)	< 1	0	2	2	2	1	0
		1-10	1	1	1	1	0	0
		11-100	0	0	0	0	0	0
		> 100	0	0	0	0	0	0
		Uncertain	0	0	0	0	0	0
Total		1	3	3	3	1	0	
Russia	Luga (Gulf of Finland)	< 1	2	1	0	1	0	0
		1-10	2	0	0	1	0	0
		11-100	2	2	0	2	0	0
		> 100	0	0	0	0	0	0
		Uncertain	1	1	1	1	0	0
Total		7	4	1	5	0	0	
Finland	Tornionjoki (Gulf of Bothnia)	< 1	0	0	0	0	0	0
		1-10	7	6	0	0	0	0
		11-100	2	1	0	0	0	0
		> 100	0	0	0	0	0	0
		Uncertain	0	0	0	0	0	0
Total		9	7	0	0	0	0	

Table 7.2.2.1 Densities of wild sea trout parr (individuals /100 m2) in Estonian rivers of the Gulf of Finland and main Basin in 1996-2006

River	0+											>0+										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Pada	-	-	-	1	-	1.9	48.8	5.3	7.8	19.3	76	-	-	-	18	-	18.6	1.4	1.3	4.4	15.6	10.2
Purtse	0	0	0	0	0	0	0	0	0	0	1.2	0	0	0	0	0	0	0	0	0	0	0.2
Kunda	14	7	16	1	15	0.9	12.2	0.3	23.8	1.2	11	6	21	2	11	3	4.3	1.2	1	0.3	6.5	1.1
Toolse	-	-	-	3	-	-	-	0	0.5	21.4	20.6	-	-	-	4	-	3.4	-	1.9	1.1	8.4	8.5
Selja	<0.1	0	0	+	23	9.3	3.4	0	0.4	7.4	0.3	2	<1	+	+	7	0.8	10	0.5	0.4	1.1	0.2
Vainupea	15	44	2	34	9	0	22.3	0	10.9	15.5	2.7	10	13	13	15	9	0	0	4.2	0	15.5	8
Mustoja	24	22	+	8	7	2.1	6.3	0.4	0.6	19.6	35.5	8	+	+	9	2	5	2	11.9	2.4	4.8	2.0
Altja	19	88	16	84	1	46.3	32.9	0.4	2	6.6	2.0	12	5	5	15	2	6.6	6.1	1.9	0.5	0	1.0
Vosu	-	-	-	52	-	-	-	0.2	8.7	39.1	47.2	-	-	-	19	-	-	-	3.3	3.5	8.6	15.0
Loobu	10	16	+	12	1	3.1	5.1	1.3	4.8	9.6	8.4	9	+	+	21	2	1.3	6	0.7	1.2	1	1.5
Valgejõgi	2	<1	0	0.1	0	0.3	-	0	1.6	1	3.2	3	0	0	0.1	1	0.4	-	0.2	0.8	1.1	0.7
Pudisoo	-	-	4	-	-	4.2	5.5	1	26.3	21.5	0.8	-	2	2	-	-	5.1	2	0.5	0	14.9	15.4
Loo	-	-	20	-	-	-	-	0	1.1	3.4	10.2	-	2	2	-	-	-	-	11.7	0	6.9	0.0
Kaberla	-	-	2	-	-	21.6	-	0	0	53.5	0.0	-	4	4	-	-	2.3	-	1	0	0	0.0
Valkla	-	-	1	-	-	-	-	0	-	-	21.3	-	8	8	-	-	-	-	-	-	-	1.3
Jägala	-	0	0	0	0	0.4	0	0	0	0	0.0	-	0	0	0	0	0	0	0	0	0	+
Pirita	0	-	0	0.6	0.1	1.5	0.5	0	0	0.4	1.6	<1	+	+	0.6	0.1	0.7	2.1	0.3	0	0.1	0.4
Vääna	-	-	4	0.2	4	25.1	6.7	0	2.5	2.4	14.3	-	-	4	5	0.2	3.9	6	3.5	0.2	0.8	4.1
Keila	7	7	+	1	1.4	2.6	1.1	0	7.4	1.8	0.4	2	+	+	1	2	0.7	1.1	1.1	0	0.5	0.0
Vasalemma	6	10	2	15	9	5.6	4.8	0	1.9	10.8	3.0	4	9	9	6.9	-	11.6	2.6	4	1	3.8	4.6
Kloostri	0	0	0	0	0	0	0	0	0	0	15.1	0	0	0	0	0	0	0	0	0	0	1.3
Vihterpalu	-	-	2	+	-	2.5	-	0	0.3	2.4	8.9	-	2	2	0.5	-	3.7	-	2.3	0.3	8	2.0
Veskijõgi	-	-	-	0	-	0	11	0	0	3.2	0.0	-	-	-	0	9	1.1	-	2.3	23.6	6.4	3.0
Nõva	-	-	0	0.5	-	0	9	1	0.7	1.1	2.8	-	-	0	0.5	-	0	2.1	2.2	1.2	1.6	0.2
Riguldi	-	-	-	7	-	-	-	0	0	9.4	6.8	-	-	-	0	-	-	-	1	0.9	4.4	1.9
Hõbringi	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0	0	0	0	0	0	0	0	3.8
Mägara	-	-	-	-	-	-	-	-	-	23.1	-	-	-	-	-	-	-	-	-	-	0	-
Timmkanal	1.9	-	-	-	-	-	-	7.3	-	19.8	8.4	2.1	-	-	-	-	-	-	0.8	-	-	2.9
Haademeeste	0	-	-	-	-	-	-	0.4	-	-	4.4	0	-	-	-	-	-	-	3.1	-	-	3.8
Kadaka	6	-	-	-	-	-	-	0	-	-	3.8	9	-	-	-	-	-	-	13.4	-	-	53.9
Privitsa	0.6	-	-	-	-	-	-	3.3	-	-	4.9	1.2	-	-	-	-	-	-	1.3	-	-	9.0
Lemme	0.4	-	-	-	-	-	-	1.8	-	-	1.6	1	-	-	-	-	-	-	1.8	-	-	34.7
Loode	0	-	-	-	-	-	-	0.5	-	-	6.1	0	-	-	-	-	-	-	4	-	-	15.2
Treimani	0	-	-	-	-	-	-	0	-	-	-	0	-	-	-	-	-	-	0	-	-	-
Kolga	0	-	-	-	-	-	-	0	-	43.8	98.0	0	-	-	-	-	-	-	3.4	-	-	0.0
Männiku	0.4	-	-	-	-	-	-	0*)	-	24.1	4.4	1.9	-	-	-	-	-	-	0*)	-	14.6	18.8
Pämu	-	-	-	-	-	-	-	-	-	0	0.0	-	-	-	-	-	-	-	-	-	0	0.0
Taaliku	-	-	-	-	-	-	-	-	-	-	2.4	-	-	-	-	-	-	-	-	-	-	19.8
Tirtsu	-	-	-	-	-	-	-	-	-	0	0.0	-	-	-	-	-	-	-	-	-	1	1.5
Kiruma	-	-	-	-	-	-	-	-	-	17.7	17.9	-	-	-	-	-	-	-	-	-	6.4	44.3
Pidula	-	-	-	-	-	-	-	-	-	-	10.2	-	-	-	-	-	-	-	-	-	-	23.0
Punapea	-	-	-	-	-	-	-	-	-	17	38.5	-	-	-	-	-	-	-	-	-	6.5	0.6
Nuutri	-	-	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	0	-
Vanajõgi	-	-	-	-	-	-	-	-	-	19.6	-	-	-	-	-	-	-	-	-	-	11.3	-
Jämaja	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ongu	-	-	-	-	-	-	-	-	-	1.1	1.0	-	-	-	-	-	-	-	-	-	1.1	7.8

- no electrofishing survey; + high water level, counting impossible \*) - river dry

**Table 7.2.2.2** Densities of sea trout parr (number/100 m<sup>2</sup>) in the Russian rivers discharging to Gulf of Finland (sub-div 32)

River basin	Year	N sites	Number of parr	
			0+	>0+
Vidon	2004			
	2005	3	0.3	2.7
	2006	3	1.0	4.5
Lemovzha	2004			
	2005	2	5.5	2.0
	2006	3	3.5	5.6
Ukhora	2004	1	10.7	9.3
	2005			
	2006	1	0.7	17.7
Azika	2004			
	2005	1	0.0	1.0
	2006	1	2.0	1.0
Solka	2004			
	2005	3	2.8	9.4
	2006	2	9.5	8.0
Khabolovka	2004	1	3.1	9.4
	2005	1	1.3	4.2
	2006	1	9.4	3.9
Sista	2004			
	2005	2	1.2	2.9
	2006	2	1.0	2.9
Voronka	2004			
	2005	1	0.0	0.7
	2006	2	0.0	3.7
Sestra	2004			
	2005			
	2006	4	1.0	0.3
Kuokkalan	2004			
	2005			
	2006	3	1.9	5.7
Huimosen-oja	2004	2	1.6	5.8
	2005	2	0.0	10.7
	2006			
Zelenogorsky	2004	7	0.4	0.4
	2005	5	0.5	1.0
	2006			
Bystryi	2004	4	8.3	10.8
	2005			
	2006			
Uschkovsky	2004	7	0.5	2.8
	2005	2	16.3	7.5
	2006			
Pikku Vamme	2004			
	2005			
	2006	1	15.0	60.0
Gladyshevka	2004	7	0.8	1.3
	2005	1	1.0	1.0
	2006	2	5.8	6.7
Roschinka	2004	4	5.4	2.5
	2005			
	2006			
Privetnaya	2004	2	0.0	0.7
	2005	4	7.6	6.7
	2006	4	0.8	1.2
Notkopuro	2004			
	2005			
	2006	4	53.0	31.8
Jukkola east	2004	2	32.2	67.8
	2005	1	30.0	60.0
	2006			
Jukkola middle	2004	4	16.0	3.6
	2005	1	0.0	25.5
	2006			
Jukkola west	2004			
	2005	2	14.0	32.7
	2006			
Toivola	2004	3	0.0	9.1
	2005	1	90.0	25.0
	2006			
Lososinka	2004	6	0.2	1.2
	2005	3	4.0	6.5
	2006			
Kello-oja	2004	4	0.2	2.5
	2005	2	0.2	3.3
	2006			
Penttilan-oja	2004	2	21.1	14.7
	2005	1	60.0	27.5
	2006			
Koivistonpuro	2004			
	2005	2	70.5	18.1
	2006			
Melnichnyi	2004			
	2005	6	4.1	2.3
	2006			
Rompotinpuro	2004			
	2005	2	78.8	43.5
	2006			
Gorohovka	2004	2	0.0	0.0
	2005	5	0.0	0.2
	2006			
Petrovka	2004	3	0.0	0.2
	2005			
	2006	1	0.3	1.3
Malinovka	2004	3	0.0	0.0
	2005			
	2006	5	0.2	0.9
Gusinaya	2004	4	3.2	0.0
	2005			
	2006			
Selezneva	2004	2	12.0	0.0
	2005	12	1.9	2.1
	2006	4	3.0	3.9
Polevaya	2004	8	4.4	1.5
	2005	2	6.3	7.3
	2006	1	0.0	0.0
Velikaya	2004	12	0.7	0.0
	2005	9	0.0	0.4
	2006	5	0.3	0.6
Peschanaya	2004	4	0.0	0.0
	2005	6	2.3	0.2
	2006	5	1.7	4.3
Serga	2004	4	0.0	0.0
	2005	4	1.2	2.3
	2006	9	1.2	1.8
Kanan-oja	2004			
	2005			
	2006	4	11.0	7.9

**Table 7.2.3.1.** Densities of sea trout parr (number/100 m<sup>2</sup>) in the Latvian rivers discharging to Gulf of Riga and Main Basin (sub-div 28)

River basin	Year	Number of sampling sites	Number of parr	
			0+	>0+
Salaca	2003	10	5.2	2.2
	2004	10	15.9	1.6
	2005	12	33.7	1.4
	2006	10	31	2.6
Gauja	2003	10	9.8	4.8
	2004	10	22.3	10.2
	2005	12	15.4	8
	2006	12	36.8	5.8
Venta	2003	8	0	0
	2004	8	0	0
	2005	8	1.3	11.1*
	2006	9	4.4	0.2
Saka	2006	5	0	2
Vitrupe	2006	2	23.6	6
Peterupe	2006	2	27.6	14.2

\*- part of them hatchery reared

**Table 7.2.3.2** Densities of sea trout parr in electrofishing surveys in the rivers Emån and Mörrumsån, Main Basin, Sub-divisions 27+25, in 1967-2006

River	Year	Number of parr/ 100 m <sup>2</sup>		Number of sampling sites	
		0 +	> 0 +		
Emån	1967	13	0.9		
	1980-85	26	2.4		
	1992	47	2.0		
	1993	42	3.1	2	
	1994	2.5	0.6	2	
	1995	0.2	0.6	4	
	1996	0.3	0.2	4	
	1997	1.9	0.4	4	
	1998	6.9	0.4	2	
	1999	0.9	0.0	4	
	2000	1.2	0.0	4	
	2001	1.4	0.0	4	
	2002	1	0	4	
	2003	2	0.0	7	
	2004	2.3	0.3	6	
	2005	11	0.4	7	
	2006	1.9	1.1	7	
	Mean for period	1980-85	26	2.4	
		1992-94	30	1.9	
		1995-2000	1.9	0.3	
2001-2006		3.3	0.3		
Mörrumsån	1973	24	16		
	1974	23	8		
	1975	15	1		
	1976	46	3		
	1977	6	10		
	1978	15	2		
	1979	3	6		
	1980	29	2		
	1981	18	9		
	1982	14	11		
	1983	14	1		
	1984	8	5		
	1985	13	1		
	1986	11	1		
	1989	52	0		
	1990	9	0	9	
	1991	14	1	9	
	1992	11	3	9	
	1993	19	1	9	
	1994	18	7	9	
	1995	6	2	9	
	1996	8	2	9	
	1997	6	2	9	
	1998	7	1	9	
	1999	3	1	9	
	2000	5	1	9	
2001	9	0	9		
2002	3	0	9		
2003	3	0	9		
2004	8	1	5		
2005	7	1	9		
2006	2	1	9		
Mean for period	1973-89	19.4	5.1		
	1990-94	14.2	2.4		
	1995-2000	5.8	1.5		
	2001-2006	5.3	0.5		

**Table 7.2.3.3.** Densities of sea trout parr (number/100 m<sup>2</sup>) in electrofishing survey, in Lithuanian rivers, Main Basin (sub-div. 26) in 2004-2006

River	Year	Number of parr/100m <sup>2</sup>	Number of sampling sites
Neris	2004	3.3	30
	2005	1.8	22
	2006	1.64	22
Žeimena	2004	1	19
	2005	0	10
	2006	3.05	10
Šventoji	2004	3.4	16
	2005	4	12
	2006	1.45	10
Minija	2004	5.1	22
	2005	9.06	15
	2006	8.84	15
Jūra	2004	2.3	14
	2005	3.13	11
	2006	2.63	12
Dubysa	2004	7.5	9
	2005	11.6	6
	2006	7.87	5
Bartuva	2004	2.7	7
	2005	2.69	4
	2006	4.8	3
Akmena	2004	10.2	6
	2005	24.3	2
	2006	10.37	2
Šyša	2004	8.4	2
	2005	14.6	2
	2006	15.46	1
Baltijos - Šventoji basin	2005	11.36	3
	2006	8.75	3

**Table 7.2.3.4** Densities of sea trout parr (number/100m<sup>2</sup>) in electrofishing survey in Polish rivers in 2004-2006

sub-div.	River	2004			2005			2006		
		number/100m <sup>2</sup>		nr of sites	number/100m <sup>2</sup>		nr of sites	number/100m <sup>2</sup>		nr of sites
		0+	>0+		0+	>0+		0+	>0+	
25	Parseęta	69	5.2	3	33	3.9	3	83.5	8.9	3
25	Wieprza	27	4.8	1	27	7.1	1	14.0	1.8	1
25	Słupia	19	2.4	4				13.8	3.4	1
25	Łeba	271	6.5	2	89	64	2	138.2	35.3	2
26	Drwęca	18	0.2	3						
26	Reda	14	15	2				36.5	7.0	3

**Table 7.2.3.5** Densities (N parr /100 m<sup>2</sup> stream) of sea trout parr in Danish electrofishing surveys in streams of the island Bornholm.

Year	Number of parr/100m <sup>2</sup>		Number of sites
	0+	>0+	
1966	1.0	0.8	3
1968	87.6	85.1	22
1970	76.5	50.6	1
1979	77.3	176.1	16
1980	0.0	0.0	2
1981	14.7	157.0	3
1982	76.3	101.3	27
1983	65.4	63.3	3
1984	20.6	36.2	2
1985	140.5	65.6	6
1986	60.9	184.8	7
1988	186.3	90.6	32
1989	115.5	124.2	21
1990	94.5	10.6	3
1991	358.8	75.9	1
1993	0.0	218.4	1
1994	19.6	12.7	1
1995	621.1	94.4	36
1996	24.0	89.6	36
1997	181.2	29.4	31
1998	351.7	92.4	32
1999	232.1	128.8	34
2000	185.4	68.8	35
2001	102.4	37.9	36
2002	192.0	24.0	35
2003	141.4	34.6	36
2004	257.0	34.5	34
2005	163.0	65.5	31
2006	no data	no data	no data

**Table 7.3.1** Release of sea trout eggs, alevins, fry and parr into Baltic rivers in 2006.  
The predicted numbers of smolts are added to Table 7.3.2 as enhancement.

Region	Egg	Alevin	Fry	Parr				Smolt				
				1- s old	1- y old	2- s old	3-s old	2007	2008	2009	Total	
<b>Sub-divs. 22-29</b>	(1)	(1)	(4)	(6)	(9)	(10)	(10)					
Denmark	0	0	231200	112800	0	0	0	0	13704			13704
Estonia	0	0	0	0	0	0	0	0	0			0
Finland	0	0	0	0	0	0	0	0	0			0
Latvia	0	0	0	316910	0	9000	0	1350	19015			20365
Poland	0	8309400	819720	0	6000	0	0	720	107686			108406
Sweden	0	0	54100	0	0	22300	0	3345	1623			4968
Lithuania	0	0	146000	100000	0	0	0	0	10380			10380
<b>Total</b>	0	8309400	1251020	529710	6000	31300	0	5415	152407	0		157822
<b>Sub-divs. 30-31</b>	(2)	(3)	(5)	(7)	(8)	(8)	(10)					
Finland	256000	62000	29000	10300	157400	1000	0	0	19008	3408		22416
Sweden	0	0	400100	23800	91000	0	0	0	10920	9430		20350
<b>Total</b>	256000	62000	429100	34100	248400	1000	0	0	29928	12838		42766
<b>Sub-div. 32</b>	(1)	(1)	(4)	(6)	(9)	(10)	(10)					0
Estonia	0	0	0	0	0	0	0	0	0			0
Finland	187000	33000	0	0	63900	0	0	7668	2200			9868
Russia	0	0	0	0	0	0	0	0	0			0
<b>Total</b>	187000	33000	0	0	63900	0	0	7668	2200	0		9868
<b>Grand total</b>												
<b>Sub-divs. 24-32</b>	443000	8404400	1680120	563810	318300	32300	0	13083	184535	12838		210456

Rate of survival to smolt	Time to smoltification	Rate of survival to smolt	Time to smoltification
(1)= 1.0%	2 years	(6)= 6.0%	2 years
(2)= 0.5%	3 years	(7)= 6.0%	3 years
(3)= 1.5%	3 years	(8)= 12.0%	2 years
(4)= 3.0%	2 years	(9)= 12.0%	1 year
(5)= 2.0%	3 years	(10)= 15.0%	1 year

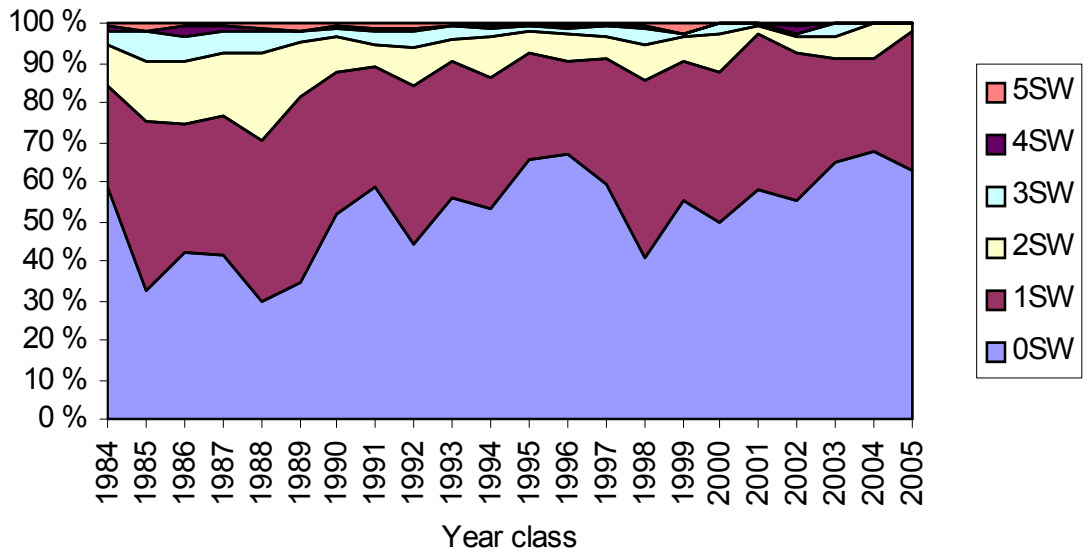
**Table 7.3.2** Estimated number of smolts originating from eggs, alevins, fry and parr releases in 1997-2006.

Area	Country	1997 <sup>1</sup>	1998 <sup>2</sup>	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 <sup>3</sup>	2009 <sup>4</sup>
Sub-divs. 22-29	Denmark	8664	56415	55284	30858	25555	45759	7912	17790	17508	13695	13695	13704	0
	Estonia	0	1500	2616	0	0	2100	1200	400	1110	0	0	0	0
	Finland	809	147	55	440	22670	33965	19550	18735	160	0	0	0	0
	Latvia	1932	142454	17467	13815	8644	11007	960	5340	15227	6462	3189	19015	0
	Poland	3918	153918	146000	167496	148500	84240	68400	91000	63236	77690	61459	107686	0
	Sweden	9676	19655	14756	13129	39333	42690	5320	29335	2055	27700	4425	1623	0
	Lituania	0	0	0	0	0	0	0	1670	2400	4350	7440	10380	0
<b>Total</b>		<b>24999</b>	<b>374089</b>	<b>236178</b>	<b>225738</b>	<b>244702</b>	<b>219761</b>	<b>103342</b>	<b>164270</b>	<b>101696</b>	<b>129897</b>	<b>90208</b>	<b>152407</b>	<b>0</b>
Sub-divs. 30-31	Finland	720	43708	57481	54268	80662	26523	42828	36670	1890	31362	11787	22704	3408
	Sweden	0	104376	55862	84237	78440	43614	24092	22921	36170	20207	22756	24561	9430
	<b>Total</b>	<b>720</b>	<b>148084</b>	<b>113343</b>	<b>138505</b>	<b>159102</b>	<b>70137</b>	<b>66920</b>	<b>59591</b>	<b>38060</b>	<b>51569</b>	<b>34543</b>	<b>47265</b>	<b>12838</b>
Sub-div. 32	Estonia	0	0	0	0	0	0	2412	2532	4407	2100	420	0	0
	Finland	0	1861	3623	20910	5500	2049	419	340	3429	345	11574	2200	0
	Russia	0	0	708	3882	3630	7800	200	1630	1281	6690	3924	0	0
	<b>Total</b>	<b>0</b>	<b>1861</b>	<b>4331</b>	<b>24792</b>	<b>9130</b>	<b>9849</b>	<b>3031</b>	<b>4502</b>	<b>9117</b>	<b>9135</b>	<b>15918</b>	<b>2200</b>	<b>0</b>
Sub-divs. 24-32	<b>Grand total</b>	<b>25719</b>	<b>524034</b>	<b>353852</b>	<b>389035</b>	<b>367576</b>	<b>299747</b>	<b>173293</b>	<b>228363</b>	<b>148873</b>	<b>190601</b>	<b>140669</b>	<b>201872</b>	<b>12838</b>

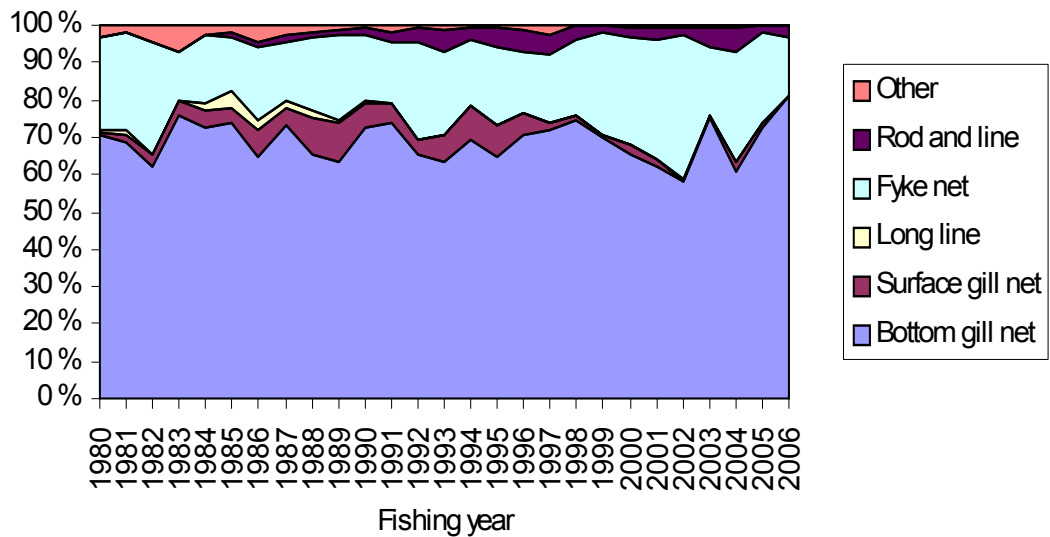
<sup>1</sup> Without 1994 and 1995 releases  
<sup>2</sup> Without 1995 releases  
<sup>3</sup> Without 2007 releases  
<sup>4</sup> Without 2007 and 2008 releases

**Table 7.3.3** Sea trout smolt releases (x1000) to the Baltic Sea by country and sub-division in 1988-2006.

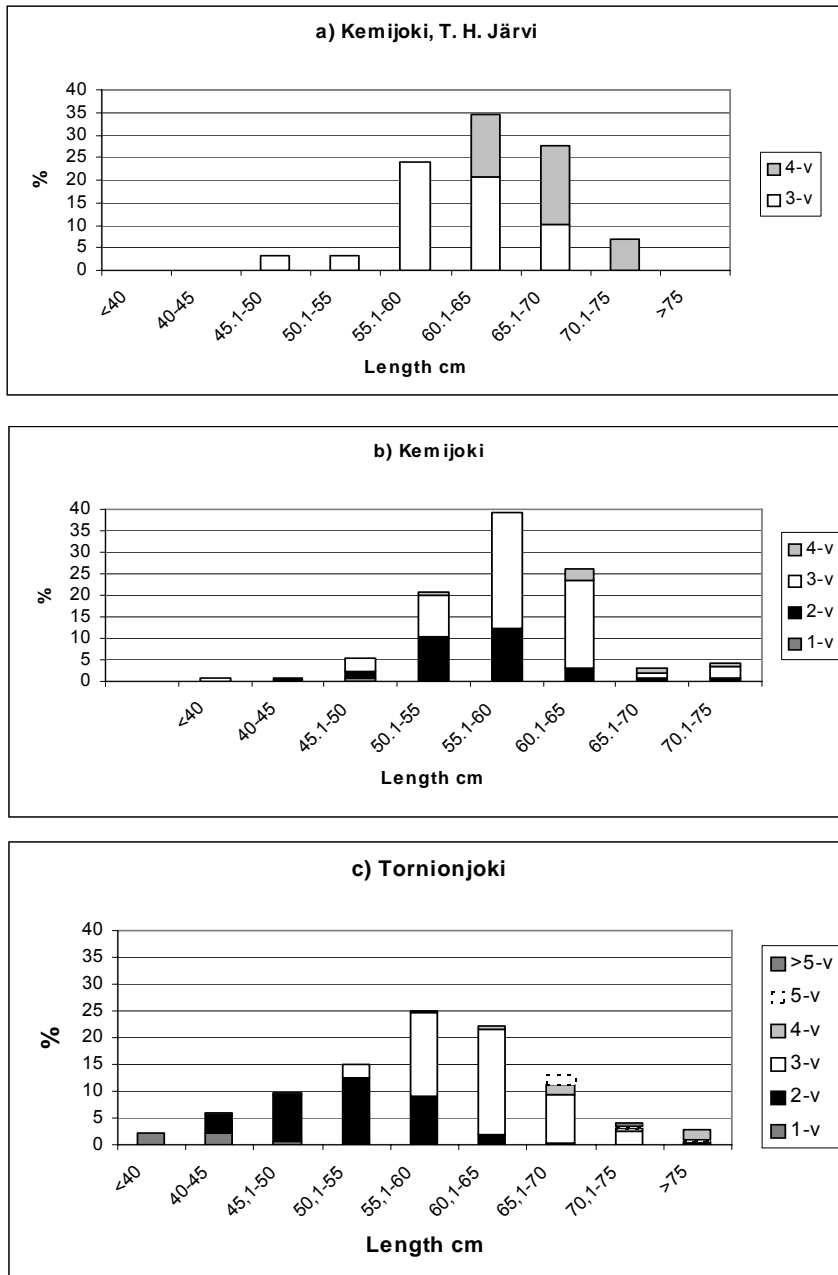
area	country	age	year																							
			1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006					
Main Basin 22-29	DK	1yr																			634	614	562	562	398	
		2yr																				30	30	30	30	21
	EE	2yr																				30	23	25	2	21
		FI	1yr		25	11	33	66	54	1	57	106	131	181	199	148	255	131	125	151	93	128				
			2yr		133	169	166	123	103	170	144	181	153	182	168	258	197	131	138	244	303	287				
	3yr		35	16	0		26	1	8	0	13	18	25	35	34	24	9	16	16	16						
	LV	1yr														114	160	170			74	91				
2yr															2	10	67			116	177					
PL	1yr														151	211	30	16	46	322	455					
	2yr														845	733	739	804	765	843	968					
SE	1yr	13	9	8	19	41	18	6		4	23	19	90	7	10	108	10	116	11	131						
	2yr	32	51	78	61	44	46	84	90	60	95	87	76	100	93	40	48	103	44	36						
Main Basin Total			45	253	282	279	274	246	262	300	352	416	486	559	1544	1648	2066	2053	2057	2415	2730					
Gulf of Bothnia 30-31	FI	1yr		7	13	22	38	26	33	8	37	7			421	49	67	1	27	7	5	9				
		2yr		288	526	586	564	455	451	451	578	527	382	462	393	365	434	301	239	273	313					
		3yr		99	27	7	18	30	9	0	28	12	5	11	11	5	27	11	15	6	1					
	SE	1yr		19	7					6																
2yr	445	392	406	406	413	376	460	642	554	429	407	372	405	424	380	428	361	413	569							
GoB Total			445	786	989	1028	1033	887	953	1107	1196	975	794	1265	858	862	842	767	622	697	891					
Gulf of Finland 32	EE	2yr																			14	6	8	9		
		FI	1yr		19	3	33	10	11	4	33	28	18	51	112	43	95	1	37	14	4					
			2yr		192	260	244	306	323	284	342	128	228	278	386	355	372	367	290	281	190	279				
	3yr			0		24	6		1	33	92	40	7	24	18	6	16									
	RU	1yr																			4	3		13		
2yr																				1		0				
GoF Total				210	264	277	340	341	287	376	189	337	369	504	422	484	373	363	305	202	301					
<b>Grand Total</b>			<b>490</b>	<b>1248</b>	<b>1535</b>	<b>1583</b>	<b>1646</b>	<b>1474</b>	<b>1502</b>	<b>1782</b>	<b>1737</b>	<b>1727</b>	<b>1649</b>	<b>2328</b>	<b>2825</b>	<b>2993</b>	<b>3281</b>	<b>3182</b>	<b>2983</b>	<b>3314</b>	<b>3922</b>					



**Figure 7.1.2.1** Age distribution of recaptured Carlin-tagged sea trout released in the Bothnian Bay (sub-division 31) area in Finland in 1984-2005



**Figure 7.1.2.2** Distribution of fishing gear in recaptures of Carlin-tagged sea trout released in the Bothnian Bay (sub-division 31) area in Finland in 1984-2005.



**Figure 7.1.2.3** Length and sea age distribution of ascending female sea trout based on historical data by T. H. Järvi in the Kemijoki river in the 1920s-1940s (a), in the fishery at the Kemijoki river mouth for egg production (b) and in the catches from the Tornionjoki river (c).