International Council for the
Exploration of the Sea

Working paper 2006 / 20
North Atlantic Salmon Working Group

National report for Finland: salmon fishing season in 2005

by

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1. Salmon fisheries in 2005

1.1 Gear and Effort

The effort in recreational fishery in the River Teno (Tana in Norwegian) in 2005 followed the decline since the record-breaking fishing season in 2002. The number of tourist anglers was 7 776 being 11% less than in 2004 but still much above the lowest figure in recent years, in 1997. The number of fishing days decreased from 29 494 in 2004 to 27 627 in 2005 (6%) (Table 1). The tourist fishing in the River Näätämöjoki (Neidenelva in Norwegian) increased slightly in 2005 (705 anglers, 3 578 days) from year 2004 (657 anglers, 3 233 days).

There has been a slight decrease in the local river fisheries in the River Teno since the late 80's – early 90's, the present numbers of issued licenses being 70-75% of the figures ten years earlier (1100; Table 1). In 2005, the number of licenses for local net fishery was 590 (average 692 in 1984-2004) and the number of licenses for local rod fishery was 165 (average 159 in 1984-2004).

During the past five-year period the effort in gill net and weir fishery in the River Teno has decreased, whereas the drift net effort has generally increased. However, there were 102 drift net fishermen in 2005 being somewhat less than in 2004 (120). In the River Näätämöjoki, there are c. 35 local families that are fishing with 2-3 gill nets each. The number of fishing families has been stable (30-35) in recent years.

1.2 Catches and CPUE

The total catch of the River Teno, Finland and Norway combined, was 77 t (45 t in Finland), which was 9% higher than in the previous year but well below the long-term average (137 t, 1972-2004)

(Fig. 1). The total catch of the River Näätämö was 6.9 t (1.8 t in Finland), which was 2% higher than in 2004 and below the long-term average (8,4 t, 1972-2004; Fig. 1).

A majority (71 %) of the River Teno catch was taken by rod and line fishery, whereas 29 % was caught by weir, gill net, drift net and seine. The drift net catch (allowed 20 May-15 June) decreased almost 50 % from 2004 being 2.9 t in 2005 (ten-year average 5.8 t). Local rod and line catch increased by 20% from 2004, being 11.0 t in 2005 (ten-year average 17.0 t).

CPUE for the recreational rod and line fishery for tourist anglers have yearly been estimated based on numbers of fishermen & fishing days and catch inquires. CPUE of the anglers in the River Teno was 0.8 kg per angler day and 2.7 kg per angler season (mean 3.6 days). The figures in the River Teno have significantly increased from the previous year but are lower than the previous five-year averages (Table 3). CPUE of the rod and line fishery of the River Näätämö was 0.2 kg per angler day and 1.3 kg per angler season in 2004 being higher or at the same level as in the previous year and the previous five-year averages (Table 3).

1.3 Composition of catches

1 SW salmon constituted 68% (in numbers) of the catch of the River Teno in 2004 which was much higher than the figure in 2004 (38%) and close to the long term average. The proportions of MSW salmon were 9 %, 15 %, 1 % and 7% for 2 SW, 3 SW, 4&5 SW, and previous spawners, respectively (Fig. 2). The age distribution is calculated based on scale samples gathered from the fishery of the River Teno main stem and the major tributaries, representing a mixed sample of the river system. The same trend in sea age distribution with increased proportion of grilse was detected in the River Näätämöjoki.

1.4 Origin of catches

Out of the 3 914 scale samples gathered from the River Teno adult salmon, 16 (0.41%) were classified as escapees from fish farms in the sea (Table 4). The classification between wild and reared fish has been carried out using scale analysis. The sample represents salmon run during the fishing season (June-August). However, there are indications that the proportion of escapees may be higher later, after the fishing season (Table 4). In 2003, in two accidents on the Norwegian coast in close vicinity of the River Teno some 150 000 farmed salmon escaped from net pens. In spite of this escapement of large, slaughter-ready salmon (3-6 kg) that were expected to mature in 2003 or 2004 at the latest, the number of escaped fish detected in the river fisheries have not been significantly different from the typical long-term levels, and intensive fishery by Norwegian authorities in the lowest part of the river in September-October 2003-2004 have resulted in only few specimens (Table 4). No post season sampling was conducted in 2005.

2. Status of stocks

2.1 Juvenile salmon densities

The long term electrofishing surveys in permanent sampling sites revealed variable development in salmon fry (0+) and parr (1+ and older) densities in the rivers Teno, Utsjoki, Inarijoki and

Näätämöjoki in 2004 (Tables 5 and 6). After several years of high levels of juvenile salmon abundance, the densities in 2005 were generally below or at the levels of last year and the previous five-year means. However, the fry densities in Utsjoki were the second highest in the time series since 1979.

2.2 Smolt and adult salmon counts in Utsjoki

The number of smolts at the video counting station in Utsjoki in 2005 was incomplete because of high water levels in June. When the counts were roughly corrected for the short sampling period, the estimated smolt abundance could have been close to the increased levels of 2004. Adult salmon counts increased substantially from 2004 (Table 7).

3. Recent papers on salmon monitoring and research in the rivers Teno and Näätämöjoki

Niemelä, E., Julkunen M., Erkinaro J. & Mäkinen T.S. 2001: Seasonal variation in density of juvenile Atlantic salmon in shoreline habitats of a large subarctic river. Journal of Fish Biology 59: 555-568.

Erkinaro, H., Erkinaro, J., Rask, M. & Niemelä, E. 2001: Status of zoobenthos and fish populations in subarctic rivers of the northernmost Finland: possible effects of acid emissions from Russian Kola Peninsula. Water, Air and Soil Pollution 130: 831-836.

Økland, F., Erkinaro, J., Moen, K., Niemelä, E., Fiske, P., McKinley, R.S. & Thorstad, E. 2001: Return migration of Atlantic salmon in the River Tana: phases of migratory behaviour. Journal of Fish Biology 59: 862-874.

Mäki-Petäys, A., Huusko, A., Erkinaro, J. & Muotka, T. 2002: Transferability of habitat suitability criteria of juvenile Atlantic salmon (Salmo salar) Canadian Journal of Fisheries and Aquatic Sciences 59: 218-228.

Heinimaa, S. & Erkinaro, J. 2004: Characteristics of mature male parr in the northernmost Atlantic salmon populations. Journal of Fish Biology 64: 219-226.

Karppinen, P., Erkinaro, J., Niemelä, E., Moen, K. & Økland, F. 2004: Return migration of Atlantic salmon in the River Tana: distribution, exploitation and migration pattern of radio-tagged 1SW salmon. Journal of Fish Biology 64: 1179-1192.

Niemelä, E., Erkinaro, J., Dempson, J.B., Julkunen, M., Zubchenko, A., Prusov, S., Svenning, M.A., Ingvaldsen, R., Holm, M. & Hassinen E. 2004: Temporal synchrony and variation in abundance of Atlantic salmon in two subarctic Barents Sea rivers: influence of oceanic conditions. Canadian Journal of Fisheries and Aquatic Sciences 61: 2384-2391.

Mäki-Petäys, A., Erkinaro, J., Niemelä, E. Huusko, A. & Muotka, T. 2004: Spatial distribution of juvenile Atlantic salmon (*Salmo salar*) in a subarctic river: size-specific changes in a strongly seasonal environment. Canadian Journal of Fisheries and Aquatic Sciences 61: 2329-2338.

Davidsen, J., Svenning, M.-A., Orell, P., Yoccoz, N., Dempson, J.B., Niemelä, E., Klemetsen, A., Lamberg, A. & Erkinaro, J. 2005: Spatial and temporal migration of wild Atlantic salmon smolts determined from a video camera array in the sub-Arctic River Tana. Fisheries Research 74: 210-222.

Niemelä E., Erkinaro, J., Julkunen, M., & Hassinen, E. 2005: Is juvenile salmon abundance related to subsequent and preceding catches? Perspectives from a long-term monitoring programme. ICES Journal of Marine Science 62: 1617-1629

Niemelä E., Erkinaro, J., Julkunen, M., Hassinen, E., Länsman M. & Brørs S. 2006. Temporal variation in abundance, return rate and life histories of previously spawned Atlantic salmon in a large subarctic river. Journal of Fish Biology, In press.

Table 1. Number of gear units (fishermen and fishing days) licensed in Finland.

	The Teno River				R. Näätämö
	Recreational fishery		Local rod and		Recreational
	Tourist anglers		net fishery		fishery
Year	Fishing days	Fishermen	Fishermen		Fishermen
1981	16 859	5 742	868		467
1982	19 690	7 002	912		484
1983	20 363	7 053	1017		587
1984	21 149	7 665	1040		677
1985	21 742	7 575	1038		866
1986	21 482	7 404	989		691
1987	22 487	7 759	1093		689
1988	21 708	7 755	1070		538
1989	24 118	8 681	1076		696
1990	19 596	7 677	920		614
1991	22 922	8 286	974		718
1992	26 748	9 058	943		875
1993	29 461	10 198	972		705
1994	26 517	8 985	921		671
1995	24 951	8 141	892		716
1996	17 625	5 743	863		814
1997	16 255	5 036	839		588
1998	18 700	5 759	793		673
1999	22 935	6 857	780		850
2000	28 385	8 275	779		624
2001	33501	9367	863		590
2002	37491	10560	853		660
2003	34979	10032	832		644
2004	29494	8771	801		657
2005	27627	7776	755		705
Mean 2000-04	32770	9401	826		635
% change [6]	-15,7	-17,3	-8,6		11,0
Mean 1994-04	26432	7854	830		682
% change [6]	4,5	-1,0	-9,0		3,4

Table 2. Catch of Atlantic salmon in Finland in numbers and weight (kg) divided in different sea age groups. PS= previous spawners

	Numbers							Weight (kg)						
	1 SW	2 SW	3 SW	4 SW	5 SW	PS	Total	1 SW	2 SW	3 SW	4 SW	5 SW	PS	Total
1996	12230	1275	1424	234	19	354	15536	19566	5042	11704	3815	469	3145	43741
1997	10341	2419	1674	141	22	418	15017	14960	9570	14746	1845	505	3100	44725
1998	11792	1608	1660	147	0	460	15667	19307	6673	15724	2529	0	3371	47604
1999	18830	1528	1579	129	6	490	22562	33390	7563	16077	2117	142	3181	62470
2000	20817	5152	2379	110	0	991	29448	38543	24268	24511	2060	0	5949	95331
2001	13062	6308	5415	104	0	2360	27249	20751	32079	57802	1793	0	13311	125736
2002	6531	5361	4276	148	11	2619	18946	11522	20054	42981	2418	280	15932	93186
2003	8130	1828	3599	161	6	2204	15928	14549	7433	37523	2783	152	15111	77551
2004	3815	1424	1153	251	6	1400	8050	6588	6357	10908	3723	161	10857	38593
2005	9216	1027	1575	66	48	837	12770	16425	4733	16100	1010	1031	7695	46995

Fig. 1. Salmon catch (kg) of the Rivers Teno and Näätämöjoki in Finland and Norway. Note the different scales on vertical axes.

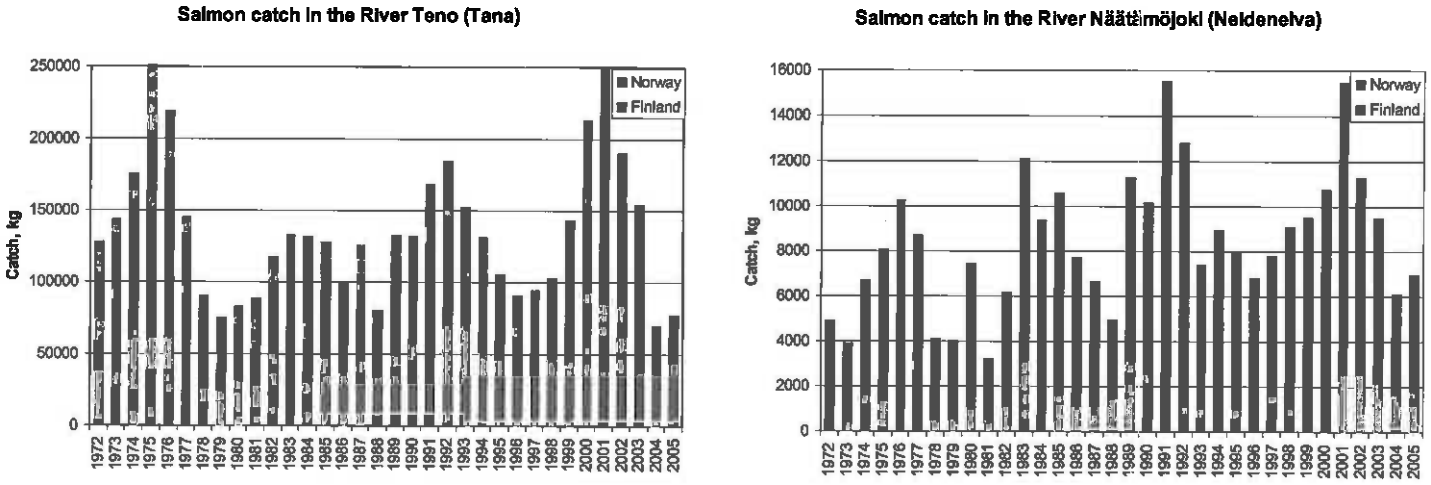

Table 3. CPUE for salmon rod fisheries in Finland (Rivers Teno and Näätämöjoki)

	Finland (Teno River)				Finland (Näätämö River)			
	Catch per angler season		Catch per angler day		Catch per angler season		Catch per angler da	
Year	kg	5 yr mean	kg	5 yr mean	kg	5 yr mean	kg	5 yr mean
1974			2,8					
1975			2,7					
1976			-					
1977			1,4					
1978			1,1					
1979			0,9					
1980			1,1					
1981	3,2		1,2					
1982	3,4		1,1	1,1				
1983	3,4		1,2					
1984	2,2		0,8		0,5		0,2	
1985	2,7		0,9					
1986	2,1		0,7					
1987	2,3	2,2	0,8	0,8				
1988	1,9		0,7		0,5		0,2	
1989	2,2		0,8		1,0		0,4	
1990	2,8		1,1		0,7		0,3	
1991	3,4		1,2		1,3		0,5	
1992	4,5	3,4	1,5	1,2	1,4	0,9	0,3	0,3
1993	3,9		1,3		0,4		0,2	
1994	2,4		0,8		0,6		0,2	
1995	2,7		0,9		0,5		0,1	
1996	3,0		1,0		0,7		0,2	
1997	3,4	3,2	1,0	1,0	1,1	0,9	0,2	0,2
1998	3,0		0,9		1,3		0,3	
1999	3,7		1,1		0,8		0,2	
2000	5,0		1,5		0,9		0,2	
2001	5,9		1,7		1,2		0,3	
2002	3,1	3,6	0,9	1,0	0,7	0,9	0,2	0,2
2003	2,6		0,7		0,8		0,2	
2004	1,4		0,4		0,9		0,2	
2005	2,7		0,8		1,3		0,2	

Table 4. Proportions of escaped farmed Atlantic salmon in the River Teno during (June-August) and after (September-October) the fishing season.

Year	Fishing season (June-August)			After season (September-October)		
	samples (n)	Farmed (n)	Farmed (%)	samples (n)	Farmed (n)	Farmed (%)
1987	1453	1	0,07			
1988	1043	1	0,10			
1989	2135	7	0,33			
1990	2535	11	0,43	19	9	47
1991	3237	13	0,40	7	3	43
1992	3808	2	0,05			
1993	2543	1	0,04			
1994	1654	7	0,42			
1995	1698	9	0,53			
1996	2225	3	0,13	8	1	13
1997	2826	7	0,25	21	0	0
1998	4237	11	0,26			
1999	8298	10	0,12			
2000	9002	9	0,10			
2001	8358	11	0,13			
2002	6870	22	0,32			
2003	4291	19	0,44	19	2	11
2004	2319	16	0,69	8	1	13
2005	3914	16	0,41			

Fig. 2. Proportions of different sea age groups of salmon in the River Teno. PS=previous spawners.

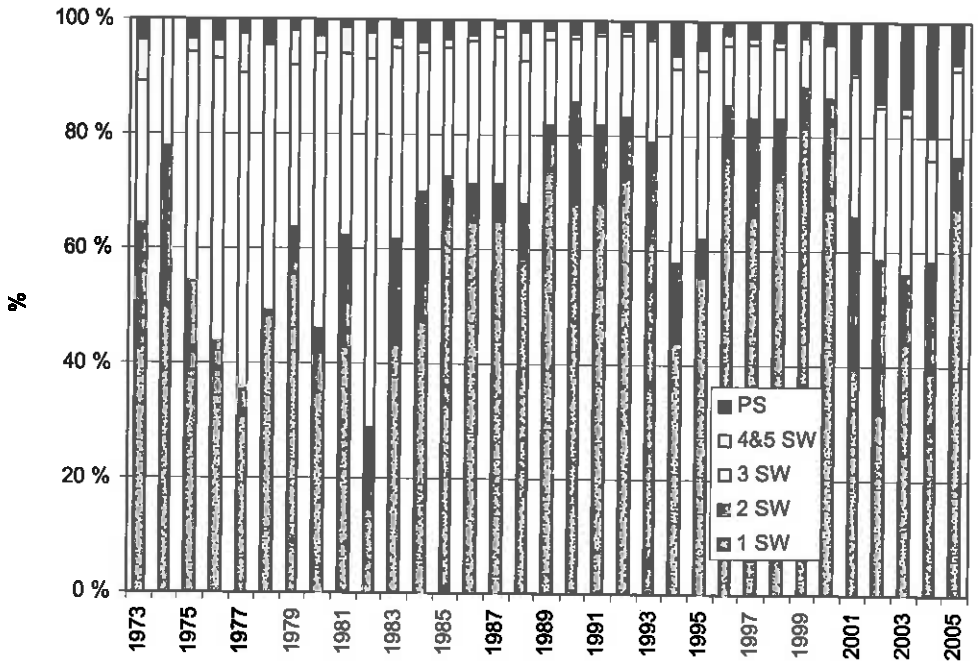

Table 5. Juvenile salmon densities (means of age groups 0+ and ≥1+ per 100 m² over the sites sampled, and standard deviations) at the permanent electrofishing stations in the River Teno and its two major tributaries. Average figures of the previous five years are included.

	Teno							Utsjoki							Inarijoki						
	n sites	0+	sd	1+	sd	TOT	sd	n sites	0+	sd	1+	sd	TOT	sd	n sites	0+	sd	1+	sd	TOT	sd
1979	17	9.5	16.4	17.5	13.0	27.1	18.6	11	54.4	102.8	41.9	33.3	97.8	123.2	7	8.3	12.8	10.3	8.9	19.3	16.7
1980	22	22.7	47.7	16.0	15.0	40.3	50.4	11	15.5	43.8	35.6	36.5	51.2	63.5	7	36.1	42.7	13.5	12.8	49.3	42.3
1981	5	14.1	20.9	5.7	5.8	26.3	36.5	9	33.4	52.2	19.0	20.4	50.8	58.3	6	9.5	12.3	14.1	12.7	23.2	22.2
1982	22	49.3	102.5	11.9	8.0	60.9	102.7	11	19.5	40.6	21.1	20.1	38.9	55.8	7	17.3	31.3	9.8	8.3	27.3	36.5
1983	22	48.8	63.8	27.2	17.8	73.7	59.0	11	48.6	84.8	43.7	44.8	87.8	125.5	7	32.2	27.3	31.8	12.3	66.8	34.1
1984	22	42.3	47.7	18.7	13.0	62.0	48.6	11	37.8	52.4	33.5	31.3	67.9	74.8	7	30.3	33.9	23.5	11.5	55.5	33.9
1985	22	58.1	63.3	33.4	21.1	92.9	74.2	11	46.1	79.2	46.5	44.3	92.3	113.1	7	27.3	46.5	19.5	11.0	46.7	45.2
1986	22	43.8	62.8	33.7	21.5	77.1	62.7	12	26.7	49.0	15.7	17.6	42.2	54.6	7	13.0	5.3	35.3	22.1	49.3	18.8
1987	22	41.9	83.9	22.7	15.4	67.3	86.7	12	43.1	76.1	34.2	38.1	76.3	91.2	7	9.0	13.4	42.2	16.8	51.6	15.7
1988	22	26.8	36.5	19.6	22.7	49.5	42.2	12	12.5	27.3	41.4	32.1	52.9	55.5	7	26.5	58.4	30.4	14.2	57.3	50.1
1989	22	25.0	33.9	23.7	19.1	50.2	42.4	12	51.5	83.4	24.7	23.6	74.5	96.5	7	31.4	47.3	9.7	4.0	42.7	44.5
1990	22	16.2	23.1	15.4	13.2	31.2	30.2	12	52.8	79.9	28.7	35.0	79.0	99.1	7	35.4	34.6	26.5	13.9	63.1	30.7
1991	22	23.0	30.4	26.7	17.9	49.7	38.0	12	12.0	20.8	13.3	10.9	24.1	27.6	7	27.2	21.6	18.9	23.2	44.6	39.0
1992	2	52.8	19.4	12.3	12.0	61.5	27.3	12	19.2	25.1	23.6	24.2	42.6	47.9	7	20.0	22.4	35.8	17.7	57.4	26.5
1993	22	27.5	49.4	26.1	28.2	54.4	58.7	12	28.0	44.1	37.5	29.4	63.4	70.9	7	14.4	12.3	44.9	15.7	65.1	20.1
1994	22	55.7	67.8	34.9	18.0	93.9	60.6	12	35.8	47.1	72.0	61.4	106.8	101.0	7	26.7	23.5	51.7	22.2	77.7	16.5
1995	22	33.1	33.0	41.5	27.9	79.0	49.4	12	39.5	60.5	34.6	34.3	70.4	80.7	7	22.4	18.2	36.5	20.4	59.4	15.4
1996	22	24.8	38.8	24.2	15.7	50.7	46.3	12	29.5	53.7	24.6	22.0	53.9	68.1	7	12.9	12.0	23.3	20.2	37.6	22.8
1997	22	19.2	28.8	23.0	13.4	41.9	33.4	12	36.4	72.2	32.0	29.2	64.9	85.9	7	35.3	45.3	17.7	13.5	53.9	40.2
1998	22	19.1	26.1	14.3	13.0	33.2	28.0	12	45.7	82.3	24.0	26.0	68.3	101.8	7	29.3	39.9	17.3	13.0	47.0	39.0
1999	22	19.0	28.5	27.5	18.9	47.6	40.4	0	-	-	-	-	-	-	7	27.7	26.3	38.7	26.9	67.0	20.5
2000	22	22.9	33.5	18.0	17.0	42.1	39.7	12	57.1	63.7	33.7	24.0	88.6	69.2	7	21.6	16.2	29.4	22.9	51.1	20.6
2001	20	47.6	40.1	17.3	13.6	64.1	44.7	0	-	-	-	-	-	-	6	118.0	142.1	27.1	23.7	140.2	131.9
2002	15	59.3	52.0	22.9	17.9	81.9	48.8	12	45.6	53.1	40.9	30.3	92.2	75.3	7	57.4	96.3	49.3	41.0	111.7	96.2
2003	22	61.4	66.5	24.3	20.9	87.0	71.4	12	86.4	102.8	22.3	27.5	107.7	113.2	7	99.3	91.1	42.1	18.0	139.9	89.5
2004	21	59.3	49.9	25.5	18.6	88.0	57.1	12	34.6	39.0	16.2	18.0	49.1	46.7	7	129.9	185.9	31.1	15.0	163.0	184.5
2005	22	29.6	33.9	23.2	15.9	53.1	41.2	12	68.2	145.0	27.2	31.0	95.2	148.3	7	34.6	66.0	35.7	25.1	67.3	79.9
00-04 MEAN		50.1		21.6		72.6			55.9		28.3		84.4			85.2		35.8		121.2	

Table 6. Juvenile salmon densities (means of age groups 0+ and ≥1+ per 100 m² over the sites sampled, and standard deviations) at the permanent electrofishing stations in the River Näätämöjoki on the Norwegian (lower) and Finnish (upper) part. Average figures of the previous five years are included.

	Näätämöjoki. Finland							Näätämöjoki. Norway						
	n sites	0+	sd	1+	sd	TOT	sd	n sites	0+	sd	1+	sd	TOT	sd
1990	16	12.0	22.4	14.4	15.6	30.3	35.8	4	35.7	23.6	108.0	33.5	140.6	46.2
1991	15	12.1	15.8	34.6	29.4	47.0	36.7	6	4.0	2.5	110.4	42.6	115.7	41.7
1992	5	1.0	1.9	3.5	3.6	4.6	5.6	2	21.1	11.6	50.3	24.4	73.3	41.0
1993	16	31.7	52.0	49.9	43.2	82.0	75.5	6	18.0	13.6	122.6	38.4	140.2	43.5
1994	15	4.0	5.4	49.3	41.6	53.3	45.0	12	13.5	15.7	97.7	49.6	116.5	53.0
1995	13	6.3	12.9	21.7	19.4	29.2	29.4	13	12.9	13.4	88.4	51.9	101.0	56.6
1996	15	3.7	11.7	14.3	15.3	18.1	19.8	13	4.3	5.7	42.9	26.5	47.2	30.2
1997	12	2.9	5.2	10.5	10.5	13.5	13.5	13	5.4	8.1	34.2	21.8	40.0	21.1
1998	15	4.5	11.3	10.7	12.6	15.2	16.1	13	7.9	9.3	34.4	16.7	41.7	19.3
1999	0	-	-	-	-	-	-	0	-	-	-	-	-	-
2000	16	15.3	21.4	13.4	11.3	27.9	29.8	13	3.7	5.7	37.0	25.5	40.3	26.2
2001	6	24.5	33.5	22.3	17.5	46.7	38.0	13	15.9	17.9	34.7	23.0	50.2	31.6
2002	15	30.7	31.4	16.7	12.7	49.3	43.0	13	14.4	15.4	46.4	26.2	60.7	38.4
2003	10	33.8	38.4	38.7	25.9	74.6	55.7	13	16.7	23.9	43.3	23.2	60.2	33.8
2004	14	11.3	19.7	21.5	22.8	32.8	38.7	9	19.2	20.4	36.2	24.3	55.9	40.0
2005	16	7.9	14.9	11.9	15.4	19.5	22.4	13	13.7	16.8	58.0	28.1	72.0	37.0
Mean 00-04		23.1		22.5		46.3			14.0		39.5		53.4	

Table 7. Counts of smolts and adult salmon in the video counting station in the River Utsjoki.

Year	Smolts	1SW	MSW	Adult salmon , total
2002	12 851	2744	348	3 092
2003	14 969	2308	274	2 582
2004	26 380	1201	94	1 295
2005	12 071*			2 953*

* incomplete counts