Live Release

An overview of recent research and statistics
update April 23 2009

The following pages represent information related to live release in a Canadian and North Atlantic context. It includes:

pages 1 and 2: Bibliography of live release research in the past two years (electronic copy of each study available on request)

page 3: graph comparing live release rates among North Atlantic countries 1992 to 2007 (International Council for the Exploration of the Sea)

page 4: actual numbers supporting graph on international rates

pages 5, 6, 7: Numbers of fish both killed and released by anglers in the Provinces (2001 – 2008)

page 8: Graphs depicting trends in rates of release of grilse and salmon in each province and overall (2001 – 2008)

page 9: Numbers of fish killed by First Nations and the Labrador by-catch fisheries for residents (2001-2008)

page 10: Graphs depicting trends of angler and First Nations kill of grilse and salmon (2001 – 2008)

page 11: graph depicting trends of First Nations kill (2001 to 2008)

The numbers provided for Canadian grilse and salmon were obtained from the report of the North American Working Group to ICES.

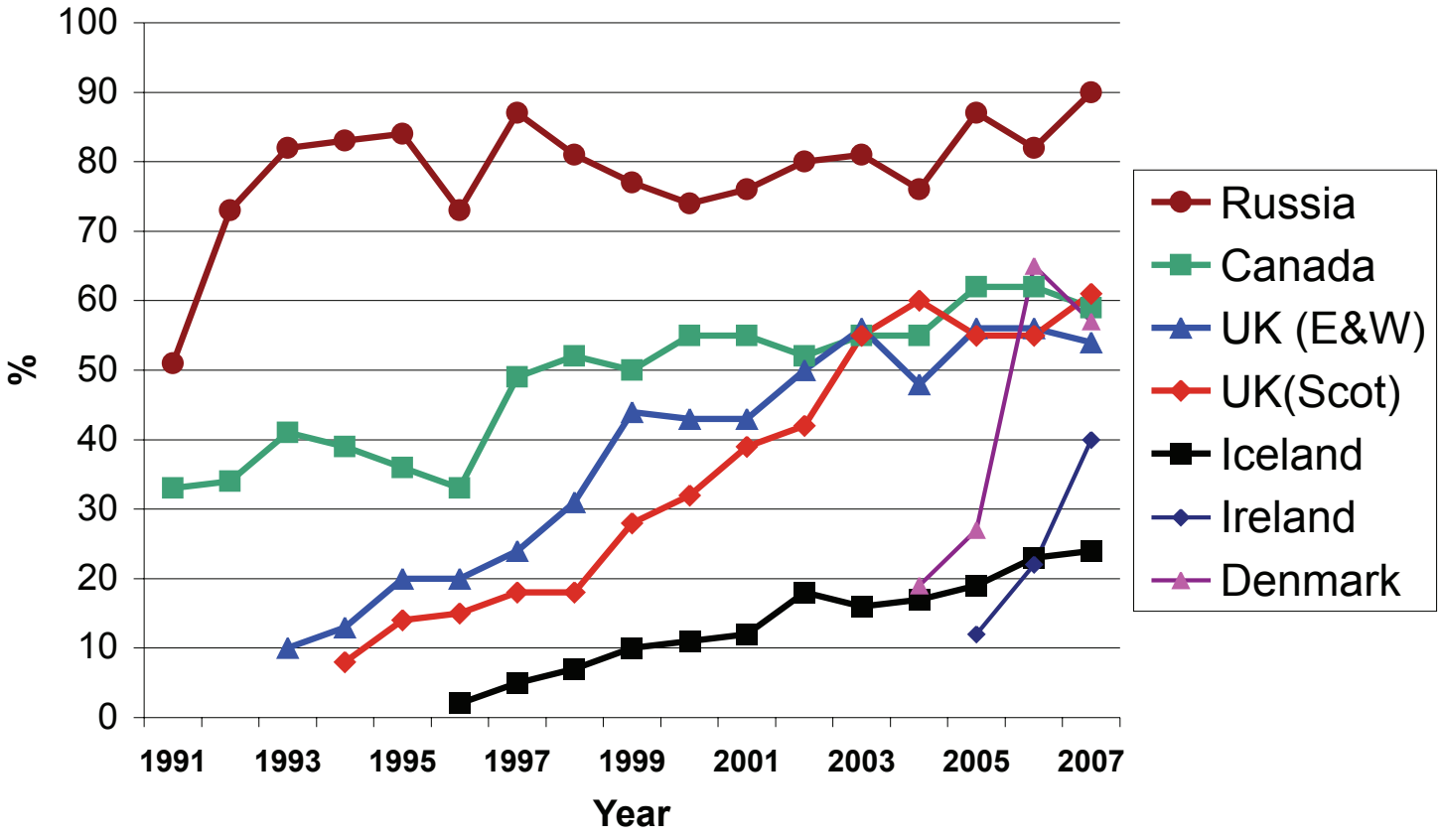
Atlantic Salmon Federation
www.asf.ca

Recent Material Related to Live Release

Principal Author	Short Title & Publication	Assessment
Robert Arlinghaus et al ***.pdf available*** (984kb)	Understanding the Complexity of Catch-and-Release in Recreational Fishing – an Integrative Synthesis, *Reviews in Fisheries Science*, pp75-167 (92 pages), 2007	Most research on catch-and-release (C&R) in recreational fishing has been conducted from a disciplinary angle focusing on the biological sciences and the study of hooking mortality after release. This hampers understanding of the complex and multifaceted nature of C&R. This synopsis develops an integrative perspective on C&R by drawing on historical, philosophical, socio-psychological, biological, and managerial insights and perspectives. Such a perspective is helpful for a variety of reasons, such as 1) improving the science supporting successful fisheries management and conservation, 2) facilitating dialogue between managers, anglers, and other stakeholders, 3) minimizing conflict potentials, and 4) paving the path toward sustainable recreational fisheries management. The present work highlights the array of cultural, institutional, psychological, and biological factors and dimensions involved in C&R. Progress toward successful treatment of C&R might be enhanced by acknowledging the complexity inherent in C&R recreational fishing.
Bill Bakke ***.pdf available*** (24kb)	Barbed and Barbless Hooks & their Impact on Mortality – Literature Review, *Native Fish Society* – Summer, 2008	A review of peer-reviewed studies that concludes there is a measureable conservation benefit to barbless hooks. The studies relate to Steelhead. Notes that reduced mortality will differentially benefit wild individuals in the population. Barbless hooks had approximately half the mortality of barbed hooks, according to one study, and another noted that hook removal was significantly faster. Same study noted that triple hooks increased injury to critical locations. Another study noted that greater air exposure increased mortality. While recommending zero time, it noted 60 sec was an important threshold. Much more info in article.
Thorstad et al ***.pdf available*** (432kb)	Atlantic Salmon C&R Story – in *Global Challenges in Recreational Fisheries, p.219-222* - 2008	Overview of the development of C&R with Atlantic salmon in N.A. & Eur. Mentions that 17 of 25 studies since 1994 are from N.A. Notes mortality rates rapidly escalate between 18ºC and 22ºC – and cites one study with 40% at 22ºC. Article explores sub-lethal effects, noting increased mortality for water pH either acidic or alkaline; handling; air exposure; and also for grilse. Notes C&R can alter upstream migration pattern. C&R noted as positive on population.

Thorstad et all ***.pdf available*** (300kb)	Effects of hook and release in Alta River, Norway, in *Fisheries Research* 60, 293-307 - 2003	C&R resulted in 3% mortality (water 10-14.5C), but behaviour somewhat altered. Notes that after C&R was compulsory in headwaters, spawning redds more than doubled.
Thorstad et al ***.pdf available*** (532kb)	Long-term effects of C&R on ascending Atlantic salmon, in *Fisheries Research 85, 330-334* - 2007	Eighteen Atlantic salmon radio-tagged and released in the lower Alta R., Norway. All survived the C&R experience, and all but one showed up in spawning areas. In upper river, 43 of 44 radio-tagged salmon survived. There was some delay in the upward migration of the fish, but almost all did reach spawning areas during the spawning period.
ICES WGNAS Report ***.pdf available*** (184kb)	Catch and Release 2.1.2 – p.13 – 2008	Large differences in live release rates between nations, from 19% in N. Ireland to 90% in Russia, reflecting management & angler attitudes. More than 178,500 released in North Atlantic in 2007, 11,000 more than 2006. Concludes that live release is an important conservation tool.
Keelan Jacobs ***.pdf available*** (3.3mb)	Kelt Tracking – ASF powerpoint 2009	The Kelt tracking project is itself a live release exercise, as all fish were acquired by anglers. 50 tagged, 2 died; 22 passed Strait of Belle Isle.
ASF Communication ***.pdf available*** (416kb)	River-by-River Assessment of Live Release, Nov. 2008	River-by-river assessment of live release in Quebec and Atlantic Canada
ASF ***.pdf available*** (366kb)	ASF Live Release Policy	Policy statements of the Atlantic Salmon Federation related to Live Release.

Live Release Rate Graph – International
1991 – 2007



ICES Notes on Live Release - 2008 Report

2.1.2 Catch and release

The practice of catch and release in rod fisheries has become increasingly common as a salmon management/conservation measure in light of the widespread decline in salmon abundance in the North Atlantic. In some areas of North America, catch and release has been practiced since 1984, and in more recent years it has also been widely used in many European countries both as a result of statutory regulation and through voluntary practice.

The nominal catches presented in Section 2.1.1 do not include salmon that have been caught and released. Table 2.1.2.1 presents catch-and-release information from 1991 to 2007 for nine countries that have records; catch and release may also be practiced in other countries while not being formally recorded (e.g. Norway). There are large differences in the percentage of the total rod catch that is released: in 2007 this ranged from 19% in UK (N. Ireland) to 90% in Russia, reflecting varying management practices and angler attitudes. Within countries, the percentage of fish released has tended to increase over time. Overall, over 178 500 salmon were reported to have been released around the North Atlantic in 2007, almost 11 000 more than in 2006. There is also evidence from some countries that larger MSW fish are released in higher proportions than smaller MSW fish. Whilst the use of catch and release is likely to result in some fish dying through exhaustion or damage, studies have demonstrated that if fish are appropriately handled, mortality following capture is low and a large proportion of fish survive to spawn (Dempson *et al.*, 2002; Webb, 1998a, 1998b; Whoriskey *et al.*, 2000).

Live Release statistical trends - International

	Canada		Iceland		Russia		UK (E&W)		UK(Scot)		Ireland		Denmark
	No. released	% of catch	No. released	% of catch	No. release	% of catch	No. released	% of catch	No. released	% of catch	No. released	% of catch	No. release
Year													
1991	28497	33			3211	51							
1992	46450	34			10120	73							
1993	53849	41			11246	82	1448	10					
1994	45804	39			12056	83	3227	13	6595	8			
1995	31211	36			11904	84	3189	20	12133	14			
1996	36934	33	669	2	10745	73	3428	20	10409	15			
1997	48387	49	1558	5	14823	87	3132	24	10906	18			
1998	56860	52	2826	7	12776	81	5365	31	13455	18			
1999	49268	50	3055	10	11450	77	5447	44	14839	28			
2000	64482	55	2918	11	12914	74	7470	43	21068	32			
2001	59387	55	3607	12	16945	76	6319	43	27699	39			
2002	50924	52	5985	18	25248	80	7658	50	24042	42			
2003	53645	55	5361	16	33862	81	6425	56	28987	55			
2004	62316	55	7294	17	24679	76	13211	48	46279	60			255
2005	63005	62	9224	19	23592	87	11983	56	45970	55	2553	12	606
2006	60486	62	8735	23	33380	82	10959	56	47471	55	5409	22	794
2007	42820	59	9263	24	44341	90	9802	54	57943	61	13125	40	959

Data from ICES WGNAS 2008 Report

Live Release Data & Rates in Canada
2001 – 2008

Kill by Anglers

	NL-Sm	NL-Lg	NL-Total	QC-Sm	Qc-Lg	Qc-Total
2001	20,536	327	20,863	4,129	5,170	9,299
2002	23,573	202	23,775	7,047	2,423	9,470
2003	21,186	226	21,412	4,855	4,472	9,327
2004	20,430	258	20,688	6,603	4,317	10,920
2005	18,543	292	18,835	3,720	3,822	7,542
2006	19,536	213	19,749	5,289	2,787	8,076
2007	16,811	233	17,044	3,737	3,263	7,000
2008	23,461	202	23,663	7,501	2,638	10,139

Release

	NL-Sm	NL-Lg	NL-Total	QC-Sm	Qc-Lg	Qc-Total
2001	22,348	5,184	27,532	809	4,674	5,483
2002	23,071	3,992	27,063	852	4,918	5,770
2003	21,379	4,965	26,344	1,238	7,015	8,253
2004	23,430	5,168	28,598	1,291	7,455	8,746
2005	33,129	6,598	39,727	1,116	6,445	7,561
2006	30,491	5,694	36,185	1,091	6,185	7,276
2007	17,168	3,892	21,060	951	5,392	6,343
2008	25,226	5,007	30,233	1,361	7,713	9,074

Release Rates

	NL-Sm	NL-Lg	NL-Total	QC-Sm	Qc-Lg	Qc-Total
2001	52.1	94.1	56.9	16.4	47.5	37.1
2002	49.5	95.2	53.2	10.8	67.0	37.9
2003	50.2	95.6	55.2	20.3	61.1	46.9
2004	53.4	95.2	58.0	16.4	63.3	44.5
2005	64.1	95.8	67.8	23.1	62.8	50.1
2006	60.9	96.4	64.7	17.1	68.9	47.4
2007	50.5	94.4	55.3	20.3	62.3	47.5
2008	51.8	96.1	56.1	15.4	74.5	47.2

Data from Catch Statistics provided by DFO to ICES WGNAS

Kill by Anglers

NB-Sm	NB-Lg	NB-Total	NS-Sm	NS-Lg	NS-Total	PE-Sm
15,937	0	15,937	169	0	169	217
13,446	0	13,446	324	0	324	120
9,411	0	9,411	278	0	278	264
13,742	0	13,742	951	0	951	76
5,733	0	5,733	373	0	373	99
6,890	0	6,890	379	0	379	77
5,909	0	5,909	280	0	280	13
9,077	0	9,077	409	0	409	13

Release by Anglers

NB-Sm	NB-Lg	NB-Total	NS-Sm	NS-Lg	NS-Total	PE-Sm
9,260	15,081	24,341	527	1,199	1,726	202
8,385	7,539	15,924	829	1,100	1,929	207
6,930	9,023	15,953	626	2,106	2,732	240
8,562	13,035	21,597	828	2,339	3,167	135
4,215	7,786	12,001	933	2,617	3,550	83
5,257	8,176	13,433	1,014	2,408	3,422	128
4,069	8,890	12,959	883	1,471	2,354	63
7,507	8,101	15,608	1,016	2,061	3,077	3

Release Rates

NB-Sm	NB-Lg	NB-Total	NS-Sm	NS-Lg	NS-Total	PE-Sm
36.8	100.0	60.4	75.7	100.0	91.1	48.2
38.4	100.0	54.2	71.9	100.0	85.6	63.3
42.4	100.0	62.9	69.2	100.0	90.8	47.6
38.4	100.0	61.1	46.5	100.0	76.9	64.0
42.4	100.0	67.7	71.4	100.0	90.5	45.6
43.3	100.0	66.1	72.8	100.0	90.0	62.4
40.8	100.0	68.7	75.9	100.0	89.4	82.9
45.3	100.0	63.2	71.3	100.0	88.3	18.8

Kill by Anglers

PE-Lg	PE-Total	CA-Sm	CA-Lg	CA-Total
0	217	40,988	5,497	46,485
0	120	44,510	2,625	47,135
0	264	35,994	4,698	40,692
0	76	41,802	4,575	46,377
3	102	28,468	4,117	32,585
0	77	32,171	3,000	35,171
1	14	26,750	3,497	30,247
0	13	40,461	2,840	43,301

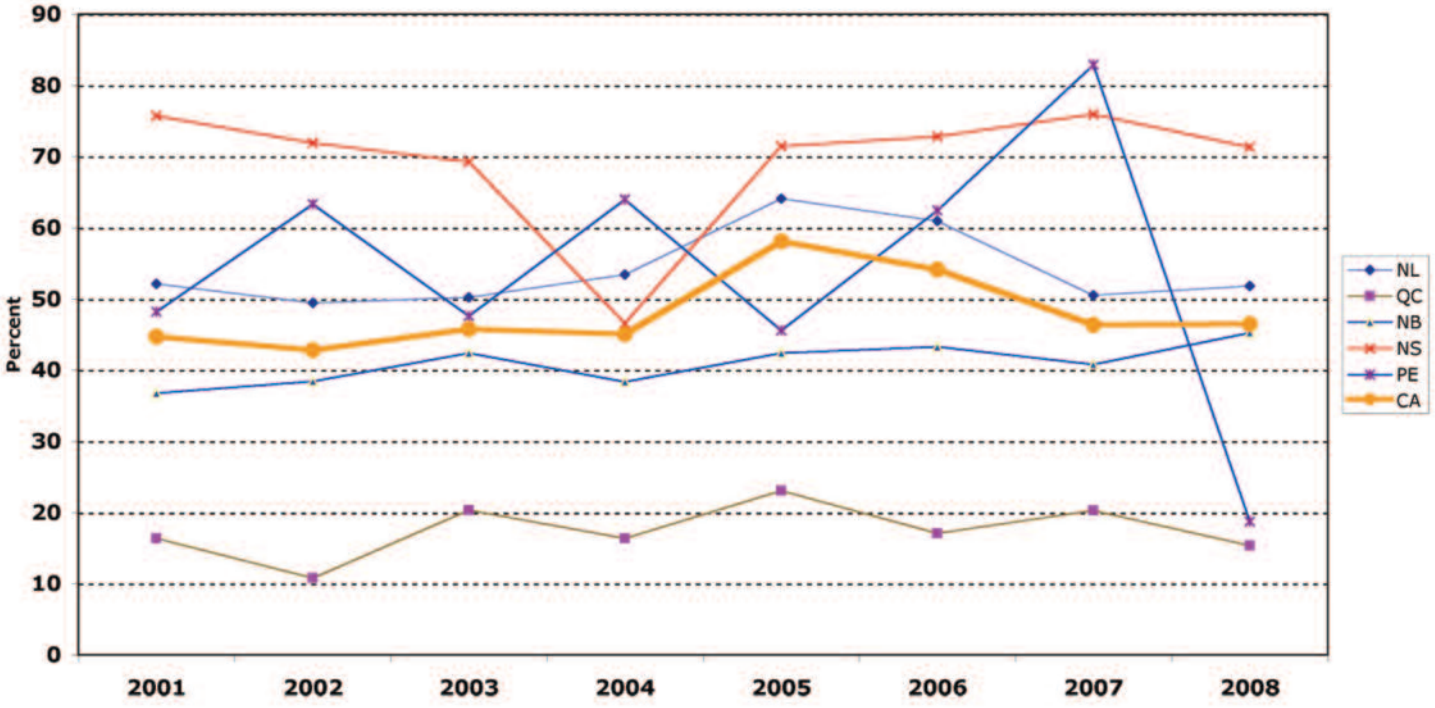
Release by Anglers

PE-Lg	PE-Total	CA-Sm	CA-Lg	CA-Total
103	305	33,146	26,241	59,387
31	238	33,344	17,580	50,924
123	363	30,413	23,232	53,645
68	203	34,251	28,065	62,316
83	166	39,476	23,529	63,005
42	170	37,981	22,505	60,486
41	104	23,134	19,686	42,820
9	12	35,113	22,891	58,004

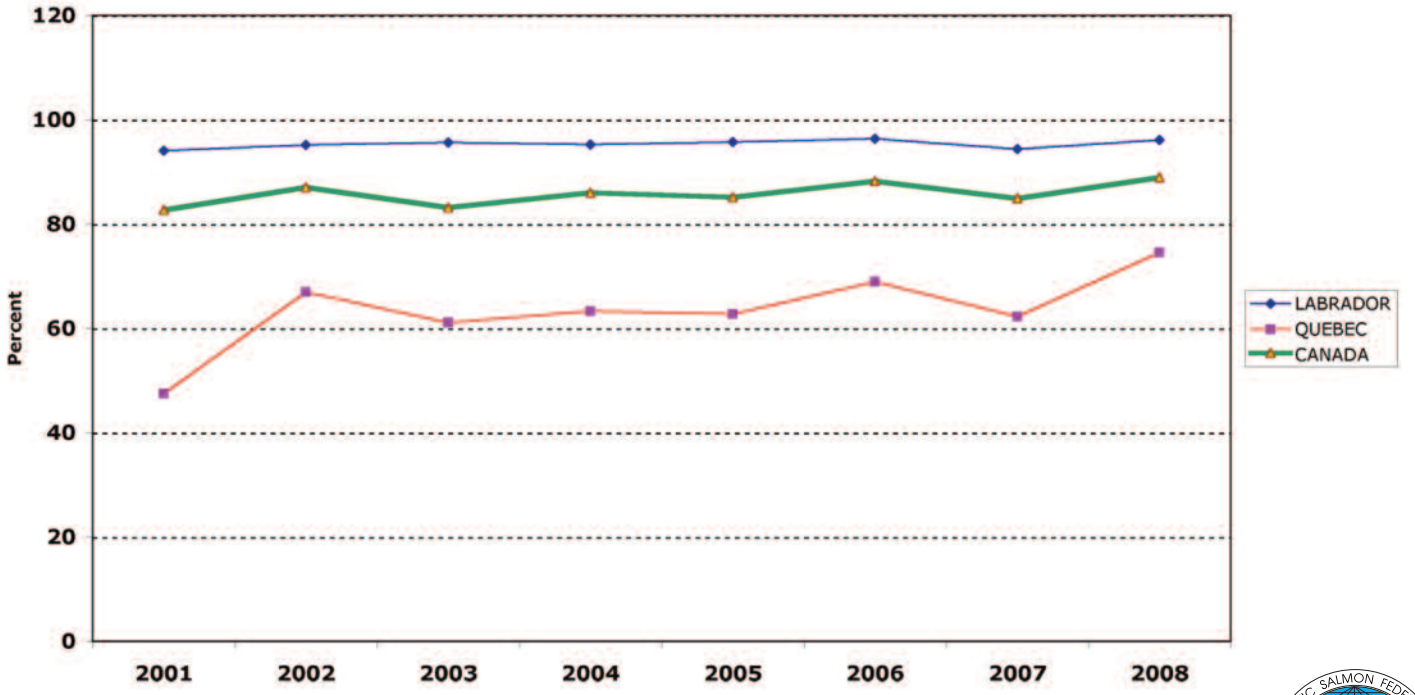
Release Rates

PE-Lg	PE-Total	CA-Sm	CA-Lg	CA-Total
100.0	58.4	44.7	82.7	56.1
100.0	66.5	42.8	87.0	51.9
100.0	57.9	45.8	83.2	56.9
100.0	72.8	45.0	86.0	57.3
96.5	61.9	58.1	85.1	65.9
100.0	68.8	54.1	88.2	63.2
97.6	88.1	46.4	84.9	58.6
100.0	48.0	46.5	89.0	57.3

Grilse Release Rates



LARGE SALMON RELEASE RATES



Native & Resident Harvests 2001 – 2008

Native Harvest

	NL-Sm	NL-Lg	NL-Total	QC-Sm	Qc-Lg	Qc-Total	NB-Sm	NB-Lg
2001	3144	1846	4990	943	3773	4716	2089	470
2002	3332	960	4292	980	3922	4902	2654	324
2003	4178	1565	5743	935	3745	4680	916	541
2004	7526	3489	11015	967	3874	4841	1766	739
2005	9361	2781	12142	834	3335	4169	2131	488
2006	8445	2759	11204	495	4456	4951	2131	488
2007	8567	2559	11126	402	3616	4018	1175	483
2008	9215	3699	12914	464	4178	4642	1530	616

Labrador Bycatch

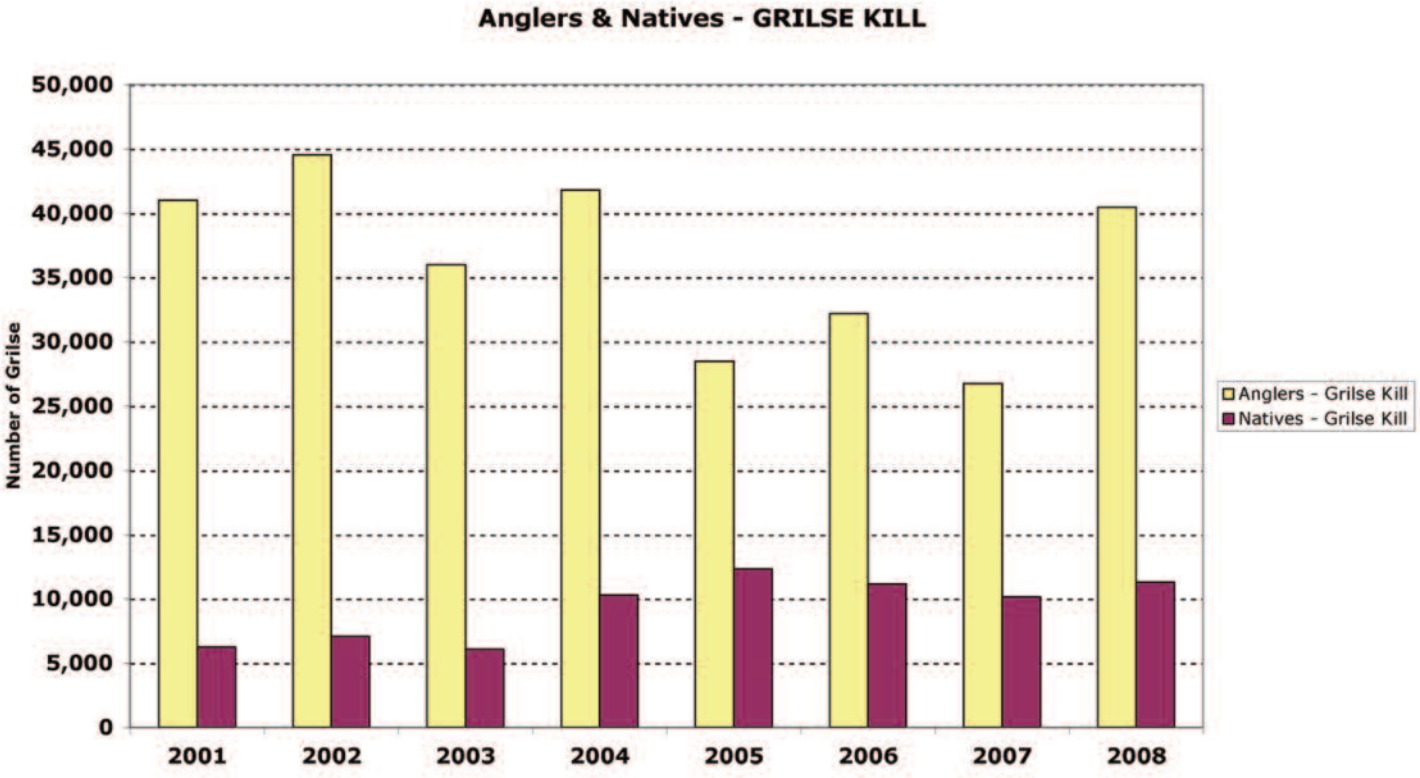
	NL-Sm	NL-Lg	NL-Total	QC-Sm	Qc-Lg	Qc-Total	NB-Sm	NB-Lg
2001	1586	488						
2002	2228	444						
2003	2357	623						
2004	654	218						
2005	915	228						
2006	915	228						
2007	640	93						
2008	620	210						

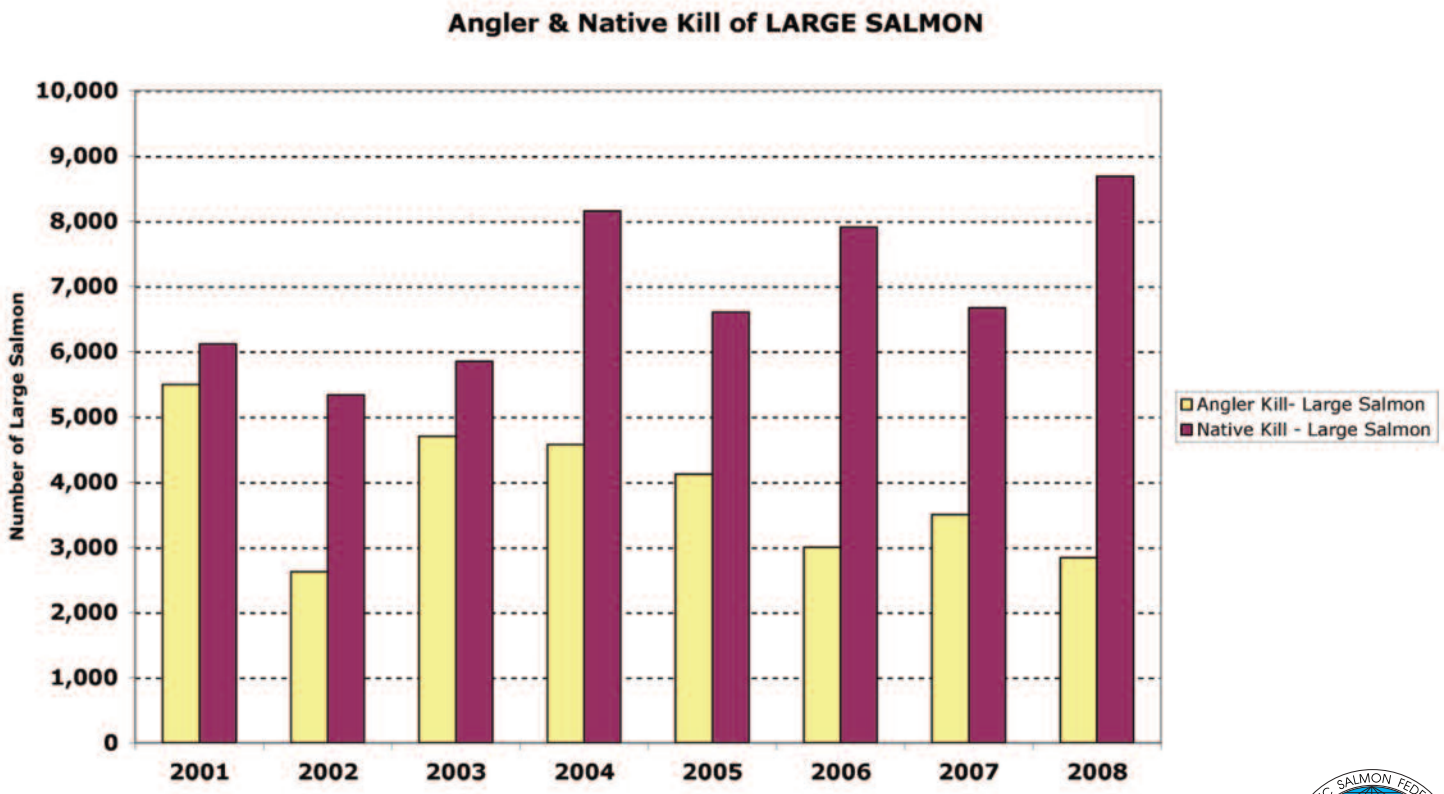
Native Harvest

NB-Total	NS-Sm	NS-Lg	NS-Total	PE-Sm	PE-Lg	PE-Total	CA-Sm	CA-Lg	CA-Total
2559	22	27	49	28	0	28	6226	6116	12342
2978	91	129	220	29	0	29	7086	5335	12421
1457	30	0	30	16	0	16	6075	5851	11926
2505	11	0	11	0	0	0	10270	8148	18418
2619	0	0	0	0	0	0	12326	6604	18930
2619	76	200	276	0	0	0	11147	7903	19050
1658	2	8	10	4	0	4	10150	6666	16816
2146	72	194	266	0	0	0	11281	8687	19968

Labrador Bycatch

NB-Total	NS-Sm	NS-Lg	NS-Total	PE-Sm	PE-Lg	PE-Total	CA-Sm	CA-Lg	CA-Total
									2074
									2672
									2980
									872
									1143
									1143
									733
									830


Anglers & Natives - GRILSE KILL
Number of Grilse
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
2001
2002
2003
2004
2005
2006
2007
2008
Anglers - Grilse Kill
Natives - Grilse Kill


Angler & Native Kill of LARGE SALMON
Number of Large Salmon
10,000
9,000
8,000
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
2001
2002
2003
2004
2005
2006
2007
2008
Angler Kill- Large Salmon
Native Kill - Large Salmon

Native Take of Salmon & Grilse