

Economic Value of Wild Atlantic Salmon

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EXECUTIVE SUMMARY

Background

By most indicators, wild Atlantic salmon (*Salmo salar*) currently face daunting challenges to their survival throughout much of their traditional range. Many of the historical rivers with salmon runs have not seen salmon return in recent years, and global remaining populations may only be 20% of their historic levels.

Atlantic Salmon Federation (ASF) is dedicated to the conservation, protection and restoration of wild Atlantic salmon and the ecosystems on which their well-being and survival depend. It is an international non-profit organization headquartered in St. Andrews, NB, with regional offices in Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador and Maine.

ASF is garnering support for large conservation initiatives and has commissioned this study in which the primary goal is to estimate the economic value of wild Atlantic salmon in Canada's four Atlantic Provinces and Quebec. The findings can then be weighed against the costs of various policy and project options. The study includes coverage of:

- ❑ recreational fishing industry and tourism,
- ❑ First Nations food, social and ceremonial fisheries,
- ❑ conservation and enhancement activity, government roles, research and
- ❑ existence value and other passive use values of the species.

In addition, four case studies are prepared for specific rivers including; the Exploits (Newfoundland and Labrador), Margaree (Nova Scotia), Miramichi (New Brunswick), and Grand Cascapedia (Quebec).

Recreational fishing

“Anglers spent an estimated \$102 million in 2010 (excluding high economic impact camps).”

A survey of ASF members gathered information from 1,324 anglers and, after excluding those who frequent high economic impact camps and lodges, the following spending results were obtained.

Total salmon-related spending by province by origin in 2010 (\$millions)

Residence	NB	NL	NS	PEI	QC	Total
Residents	\$28.0	\$19.0	\$3.3	\$0.2	\$21.1	\$71.6
Other Canadians	\$8.3	\$5.7	\$0.6	\$0.0	\$2.9	\$17.4
Visitors to Canada	\$7.6	\$2.4	\$0.4	\$0.0	\$2.7	\$13.1
Total	\$43.9	\$27.1	\$4.3	\$0.2	\$26.7	\$102.1

“Anglers at high economic impact camps spent an estimated \$26 million in 2010.”

Spending and employment information was collected for 59 high economic impact salmon fishing camps in four of Canada's eastern provinces. These were targeted since the top 10% of

anglers account for about 48% of total spending. There are upwards of 200 high economic impact camps, and the 59 sampled provide improved coverage compared to random sampling through a broad angler survey. The spending at the camps surveyed is presented by province.

Private camp spending on operations and capital by province (2010)

Province	Operations	Capital	Total
QC	\$11,344,423	\$2,359,186	\$13,703,609
NB	\$8,062,895	\$1,997,369	\$10,060,264
NS	\$772,440	\$50,000	\$822,440
NL	\$1,450,000	\$114,000	\$1,564,000
Total	\$21,629,758	\$4,520,555	\$26,150,313

This analysis of high economic impact camps likely underestimates the top 10% of anglers according to spending. This segment of anglers, possibly representing up to half (48%) of all spending, is less influenced by fluctuating circumstances and has spent relatively steadily for decades according to reports from high economic impact camps. This would suggest that total salmon angler spending has probably remained fairly stable and well above the \$100 million level. This finding differs from previous accounts of recreational salmon fishing expenditures that fluctuate from a low of \$62 million to a high of \$191 million.

Aboriginal FSC and Labrador resident food fisheries

“Aboriginal food, social and ceremonial (FSC) fisheries and Labrador resident food fisheries contribute over \$400,000 in spending.”

This does not represent the full value First Nations place on the salmon harvest, only the spending for such things as gear, supplies, and transportation. The total value is also a function of non-use values discussed below.

First Nations fisheries for food social and ceremonial (FSC) purposes have priority over other fishing activities according to the Supreme Court of Canada’s decision in *R. v. Sparrow*. Conservation requirements for salmon are recognized and Aboriginals have piloted live trap gear to replace gill nets. In general a more collaborative approach has been advanced with Aboriginals increasingly involved in wild salmon management, science, and habitat enhancement projects.

A resident food fishery remained open in Labrador after the last commercial salmon fisheries ceased in 1999. This is a directed fishery for trout allowing some by-catch of salmon.

Governments, academic researchers, and conservation organizations

“Federal government spending is about \$12 million and provincial government spending is about \$10 million.”

DFO is the lead federal agency with respect to wild Atlantic salmon and spending by other agencies is negligible. DFO’s \$12 million expenditures have historically been divided according to enhancement and habitat restoration (46%), enforcement (27%), research (24%), and management (4%).

“Provincial governments collectively spend about \$10 million annually.”

Like the federal government the provinces undertake enforcement, monitoring, enhancement and conservation, but take on a greater role with respect to licensing, tourism and marketing.

“Academic researchers spend \$756,000 on wild Atlantic salmon research”

The majority of academic research is funded by the National Science and Engineering Research Council (NSERC) and the Canadian Foundation for Innovation (CFI), but private sector companies also contribute significant amounts.

“Non-profit conservation, restoration, and education spending is about \$16 million.”

There are at least 126 non-profit organizations and facilities in eastern Canada with a mandate to conserve salmon and deliver information and education programs. Environmental conservation and restoration organizations not only spend money but also leverage in-kind contributions and volunteer efforts with an estimated value of \$12 million.

80% Public support and non-use value over \$105 million

A random survey of 995 Canadians in Atlantic Canada and Quebec gathered information about public understanding of salmon issues, willingness to invest in salmon restoration, and preferences for a long-term wild salmon program.

“The public is not familiar with wild Atlantic salmon.”

When asked about several topics related to wild Atlantic salmon about 61-72% were either not at all familiar or not very familiar. The survey was designed to provide basic information about wild salmon to participants so they could still complete the survey.

“Reading one additional screen of information depicting “what’s at stake” in salmon conservation decisions, took participants only 30 seconds and positively influenced the proportion of supporters and their willingness to pay for conservation.”

Half of the survey participants were administered one extra screen of information to determine the value of incremental education. This half was positively influenced to indicate up to an additional \$2.91 per tax-paying household or \$11.5 million in total annual support across eastern Canada.

“There is over 80% public support in Eastern Canada for a sustained 20-year program with new annual investments of \$53M - \$157M that will “likely” or “very likely” restore Atlantic salmon abundance to 40% - 80% of historic highs.”

There is clear public support for any options that move wild Atlantic salmon restoration beyond the status quo. The midpoint in the range of \$53 - \$157 million suggests there is over \$105 million in public non-use value associated with wild salmon.

“Eastern Canadian households want to be sure of what they are getting for their investment and will pay an average premium of \$0.18 for each percentage increase in salmon abundance that is ‘very likely’ instead of just ‘likely’.”

Probability of success was the most important attribute in survey participant's choices regarding wild salmon conservation options. In total this represents \$700,000 across tax-paying households in eastern Canada, effectively for research that can ensure that proposed enhancement measures will have high rates of success.

“The top two rationales for supporting wild salmon conservation were 1) that salmon should exist, 2) the importance of natural heritage and ecosystem integrity.”

Survey participants were asked to rank their top three rationales from a list that also included commercial fishing potential, research potential, international role in species at risk recovery, recreational fishing potential, First Nations and cultural heritage. Only 7% of survey participants indicated they would never support such conservation programs.

Four case-study rivers

The case study rivers, like nearly all salmon rivers in Canada, demonstrate that generating sustainable economic activity is highly valuable, especially given their rural setting. The prime tourism, recreation, food, and cultural values associated with salmon rivers represent excellent local opportunities for enjoyment, advancement, and employment.

Exploits (NL) - The Exploits is now recognized as a world-class salmon river and one of the most successful salmon enhancement projects in North America. In the late 1970s the returning run of salmon numbered around 1,500 and now the run is self-sustaining at about 40,000 fish. Annual spending of \$3.5 million from angling, tourism, and conservation generates \$3.0 million in GDP, 73 full-time equivalent jobs, and \$2.2 million worth of income.

Margaree (NS) - The Margaree-Lake Ainslie River System is a designated Canadian Heritage River with protection afforded for both cultural and natural heritage values. Compared to the other case study rivers, it has exceptionally high export value since it boasts the highest rate of international angler attraction at two-thirds of all anglers on the Margaree. Annual spending of \$2.9 million generates \$2.5 million in GDP, 70 full-time equivalent jobs, and \$2.1 million worth of income.

Miramichi (NB) - The Miramichi is recognized for having the largest salmon runs in the world. The river is home to many salmon camps and lodges attracting visitors from many countries. Over \$20 million in annual spending generates \$16 million in GDP, about 637 full-time equivalent jobs, and \$19.1 million worth of income.

Grand Cascapedia (QC) - The Grand Cascapedia is known for having some of the largest salmon each year. Eighteen of the world's fifty largest wild Atlantic salmon have come from rivers of the Gaspé Peninsula including the Cascapedia. Annual spending of about \$6.2 million generates \$7.2 million in GDP, 172 full-time equivalent jobs, and \$5.2 million worth of income.

Total economic value

“Total spending in 2010 for wild salmon related activities is estimated at \$166.0 million.”

This represents “output” in economic terms which is the starting point for the economic analysis. Breakdowns of all spending are compiled by activity and by province.

Total salmon-related spending by activity by province, 2010

Activity	NL	NS	NB	PEI	QC	Total
Aboriginal and food	\$226,000	\$10,000	\$42,000	\$0	\$132,000	\$409,000
Recreational fishing	\$28,630,000	\$5,166,000	\$53,951,000	\$173,000	\$40,363,000	\$128,283,000
Federal govt	\$5,103,000	\$2,846,000	\$3,951,000	\$100,000	\$0	\$12,000,000
Provincial govt	\$2,400,000	\$560,000	\$2,000,000	\$300,000	\$3,500,000	\$8,760,000
Academic research	\$139,000	\$190,000	\$122,000	\$121,000	\$193,000	\$765,000
NGOs	\$859,000	\$2,142,000	\$10,729,000	\$309,000	\$1,706,000	\$15,745,000
Total	\$37,357,000	\$10,914,000	\$70,795,000	\$1,003,000	\$45,894,000	\$165,962,000

“Salmon-related spending creates almost 3,873 FTE jobs and \$128 million worth of income.”

The Statistics Canada inter-provincial input-output model is used to generate a set of conventional economic indicators to show the economic impacts of spending. The FTE employment estimate understates the number of people that depend on salmon related jobs, and the total number of dependent jobs could be double since the majority are seasonal or part-time.

Total economic impacts of spending for eastern Canada, 2010 (\$000s)

Activities	Total		
	GDP	Employment*	Income
Aboriginal and food	\$328	4	\$213
Recreational fishing	\$115,263	3,316	\$100,242
Federal government	\$10,305	107	\$7,327
Provincial government	\$7,414	122	\$7,562
Academic research	\$825	12	\$615
NGOs	\$15,376	311	\$12,324
Total	\$149,511	3,873	\$128,283

Source: Statistics Canada input-output analysis model.

*Employment in full-time equivalents (FTE).

“The total annual economic value of wild Atlantic salmon is estimated at \$255 million.”

For reference, farmed Atlantic salmon in eastern Canada yielded \$270 million in GDP value in 2006 (Gardner Pinfold, 2008). This does not include government spending or academic research related to salmon aquaculture, so the findings in this study are not perfectly comparable. Having said this, wild salmon-related GDP of \$150 million is about 56% of the GDP associated with aquaculture salmon in eastern Canada and, unlike farmed Atlantic salmon, there is substantial public value associated with the wild salmon run. The total wild Atlantic salmon value of \$255 million is nearly on par with the economic significance of farmed salmon in eastern Canada.

Investing in wild Atlantic salmon

“The basis for investing in wild salmon begins with policy set by DFO as the lead federal agency.”

The general direction for conservation and enhancement of salmon populations has been set in motion by Canada’s Policy for the Conservation of Wild Atlantic Salmon. The policy sets

overarching goals and objectives for activities addressing the health of all Atlantic salmon populations. Specifically it states that the goal is: “to maintain and restore healthy and diverse salmon populations and their habitat, for the benefit and enjoyment of the people of Canada in perpetuity” (DFO, 2009)

Following assessments by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), wild salmon populations may be listed under the Species At Risk Act (SARA) thereby triggering the development of recovery strategies and action plans.

Finally the Conservation Status Report for Atlantic Salmon in Atlantic Canada and Québec involves two parts: 1) species information, and 2) anthropogenic considerations (DFO, 2009b and 2009c). “New and proposed species rebuilding and habitat restoration strategies” are put forward that build on conservation efforts. This provides some insights into the nature and scale of a comprehensive program for all wild Atlantic salmon in Canada.

“Making the case for investment in wild Atlantic salmon draws on the potential use benefits (recreational fisheries growth) and non-use benefits (public interest).”

A return to the former peak of angler numbers is viewed as the key driver for growth in spending for recreational fishing, rather than any increases in the average spending rates per angler. The return to peak levels is assumed to require gradual building over 20 years, and yet the return on a \$15 million per year investment (ROI) is estimated to be about 18%, the net present value (NPV) is \$51 million, and the breakeven point would be 6 years.

The public survey demonstrated over 80% support for investments in salmon restoration in the range of \$4.50 to \$12.50 per tax-paying household. This translates into public support for annual incremental budget allocations upwards of \$57 million. This far exceeds the \$15 million that appears justified on the basis of recreational fishing growth potential. This signals that eastern Canadians would clearly support such investments and more to reflect their high regard for the existence of wild Atlantic salmon and the importance of passing the resource on to future generations.

“Insights from the study are offered to help develop criteria for building a comprehensive wild Atlantic salmon program.”

Trade-offs will be inevitable in building such a program since not all options can be pursued or at least not at the same time in all locations. The following may be helpful for decision-makers:

- ❑ **Communicating about wild Atlantic salmon challenges to the public** is important for gaining support even if this concedes past management shortcomings.
- ❑ **Be clear and specific about the goals** of wild salmon restoration programs including where activities will take place, who will benefit and in what ways.
- ❑ **Communicating the likelihood of success** for program investments clearly matters to the public. There is much greater public support for investments that have higher expectations of success.
- ❑ **A phased approach** may be helpful for achieving and demonstrating early success and this will build support for steps that restore wild salmon stocks toward their historic highs.