

## **Miramichi Salmon and Trout Restoration – Stocking 2014**

Prepared by:

Holly Labadie  
Biologist  
Miramichi Salmon Association  
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## Introduction

Stocking Atlantic salmon first-feeding fry can improve the juvenile production capacity of the Miramichi River by targeting areas that are under-seeded or not accessible to wild spawning adults. An electrofishing survey is carried out each year by the Miramichi Salmon Association (MSA) to assess areas of the river that are lacking adequate numbers of fry or parr. Low fry or parr numbers could be the result of multiple factors, including: poor adult returns, barriers to adult movement into upper stream reaches (i.e.: beaver dams), environmental events such as ice scouring that destroys redd's, or less than optimal water conditions. Areas with zero/minimal fry present will be targeted to stock and efforts will also be made to identify and remove any impediments to natural spawning. The majority of these areas are located in small tributaries and the headwaters of the Miramichi River. Small brooks and streams often have good quality habitat and lower numbers of predators than larger downstream locations. These narrow waterways may be inaccessible however, because of barriers or decreased water levels in low flow years.

Juvenile abundance electrofishing surveys and smolt estimates are used to aid in determining specific tributaries that may need additional stocking. Since it is impossible to stock every small stream in the Miramichi with a limited numbers of fish, it is important to place hatchery salmon fry into streams that will benefit most from their introduction. Stocking salmon fry into a tributary with high salmon fry abundance could negatively impact those fish by increasing the level of competition for food resources. To avoid this, any site containing more than 100 fry/100m<sup>2</sup> is not considered for stocking as it appears to reflect a healthy natural population. Sites with less than 50 fry/100m<sup>2</sup> are considered candidates for further stocking. The absence of fry at an already stocked site may indicate that the site does not contain the appropriate habitat or it may have too many predators.

Prior to 2010, fall fingerlings were stocked and identified by an adipose clip (removal of the adipose fin). In 2010 the MSA shifted the focus from Atlantic salmon fall fingerlings to stocking first-feeding salmon fry in the early summer. These fry are incubated as eggs on unheated brook water to ensure that the rate of egg development is similar in timing to that of wild eggs. The stocking of fry over fingerlings has several benefits, including the reduced risk of

fish contracting a pathogen while in artificially high densities at the hatchery, and the improved capacity to develop “wild” behaviour tendencies at a younger age. First-feeding fry are stocked out in June/July at an average size of 0.5g which makes fin clipping impossible.

Young of the year brook trout were also raised this year in satellite rearing stations run in collaboration with J.D. Irving and the Miramichi Salmon Headwaters Federation.

The objective of this program is to improve Atlantic salmon production in the headwaters of the Miramichi watershed.

## **Methods**

Adult salmon were collected from September to mid-October 2013 for broodstock and held at the Miramichi Salmon Conservation Centre (MSCC). The fish were kept separated based on their river of origin. Once ripe, female salmon were stripped of their eggs, which were then fertilized by a male salmon from the same river. Immediately following spawning, the adults were released back into the wild via Stewart Brook, which runs beside the MSCC. Eggs were incubated on brook water until the eyed stage, when dead eggs were removed weekly. Eyed eggs were transferred to incubation boxes in preparation for hatching. After hatching, fry were fed a formulated salmonid diet (EWOS #1) for approximately 4 weeks until stocking. All salmon fry were stocked in their river of origin (“river specific stocking”).

Stocking sites were selected based on low juvenile densities found at the exact or nearby locations from the previous year’s electrofishing results and in tributaries that typically have low juvenile production (i.e.: Cains and Little Southwest). Additional salmon fry were taken to satellite rearing sites for continued growth before stocking.

## **Results**

From June 25<sup>th</sup> to July 22<sup>nd</sup> 2014, approximately 306,118 first-feeding Atlantic salmon fry were stocked into 64 sites in seven tributaries of the Miramichi River. The Northwest system

received 123,200 fry and the Southwest system 182,918 (Table 1). An additional 45,873 fry were taken to satellite holding tanks for future release by local conservation groups (Table 2). Additionally, 21,810 brook trout parr were distributed to two satellite tank rearing locations (Table 3).

Table 1. Distribution of first-feeding Atlantic salmon fry from the Miramichi Salmon Conservation Center.

Date Stocked	Branch	Stock Origin	Site	# of fish	Latitude	Longitude
25-Jun-14	Southwest	Rocky Brook	Rocky Brook	21789	46.75955	-66.67800
26-Jun-14	Northwest	Sevogle	Bridge near Slack Lake Rd	3550	47.20310	-66.31951
26-Jun-14	Northwest	Sevogle	North Branch	3550	47.20856	-66.35300
26-Jun-14	Northwest	Sevogle	North Branch	3600	47.20566	-66.34549
26-Jun-14	Northwest	Sevogle	South Branch	3500	47.10637	-66.31868
26-Jun-14	Northwest	Sevogle	Travis Brook	3575	47.04814	-66.22858
26-Jun-14	Northwest	Sevogle	Johnstone Brook	3500	47.04416	-66.22157
26-Jun-14	Northwest	Sevogle	Clearwater Brook	2300	47.10959	-66.23521
26-Jun-14	Northwest	Sevogle	Bear Lake Brook	3700	47.21623	-66.25768
26-Jun-14	Northwest	Sevogle	North Branch	3550	47.20822	-66.35380
26-Jun-14	Northwest	Sevogle	North Branch	2175	47.20350	-66.32050
26-Jun-14	Northwest	Sevogle	North Branch	4550	47.20563	-66.34533
27-Jun-14	Northwest	Northwest	Big Hole Camp bridge	3530	47.05000	-65.83294
27-Jun-14	Northwest	Northwest	Northwest	3530	47.08201	-65.83039
27-Jun-14	Northwest	Northwest	Trout Brook	3530	47.09459	-65.83587
27-Jun-14	Northwest	Northwest	Northwest	3570	47.09467	-65.83592
27-Jun-14	Northwest	Northwest	Northwest	3510	47.15281	-65.88553
27-Jun-14	Northwest	Northwest	Patty's Brook	3510	47.15843	-65.83039
27-Jun-14	Northwest	Northwest	Northwest	3673	47.15969	-65.84489
27-Jun-14	Northwest	Northwest	Patty's Brook	3490	47.18365	-65.84136
27-Jun-14	Northwest	Northwest	Mouth of Tomogonops	7226	47.23314	-65.83323
27-Jun-14	Northwest	Northwest	Portage River	7499	47.22261	-65.80909
27-Jun-14	Northwest	Northwest	Northwest	7113	47.22819	-65.82598
27-Jun-14	Northwest	Northwest	Northwest	3522	47.18945	-65.81766
27-Jun-14	Northwest	Northwest	Northwest	3591	47.21549	-65.80902
30-Jun-14	Southwest	Juniper	Doak Brook	3525	46.55106	-66.12446

30-Jun-14	Southwest	Juniper	Betts Mills Brook	3525	46.53182	-66.18076
30-Jun-14	Southwest	Juniper	Betts Mills Brook	7175	46.60010	-66.26590
30-Jun-14	Southwest	Juniper	East Branch Burntland	3625	46.42291	-66.33920
30-Jun-14	Southwest	Juniper	Burntland Brook	3525	46.39168	-66.36240
30-Jun-14	Southwest	Juniper	Burntland Brook	3800	46.36434	-66.43310
30-Jun-14	Southwest	Juniper	Main SW	3575	46.57458	-66.05964
30-Jun-14	Southwest	Clearwater	White Rapids Brook	3486	46.78940	-65.80170
30-Jun-14	Southwest	Clearwater	McKenzie Brook	3555	46.70077	-65.76564
30-Jun-14	Southwest	Clearwater	Black Brook	3486	46.66343	-65.77341
30-Jun-14	Southwest	Clearwater	Moores Donnelly Brook	3647	46.57363	-65.89027
30-Jun-14	Southwest	Clearwater	Moores Donnelly Brook	3624	46.55752	65.95001
30-Jun-14	Southwest	Clearwater	Mill Brook	3486	46.57216	-66.01737
30-Jun-14	Southwest	Clearwater	Salmon Museum	7133	46.55102	-66.14474
02-Jul-14	Southwest	Juniper	Main SW South Branch	7275	46.54507	-67.22330
02-Jul-14	Southwest	Juniper	Main SW South Branch	7532	46.55455	-67.25672
02-Jul-14	Southwest	Juniper	Main SW South Branch	7661	46.55533	-67.28783
02-Jul-14	Southwest	Juniper	Elliott Brook	7275	46.58256	-67.30694
02-Jul-14	Southwest	Juniper	Little Teague	7575	46.58388	-67.26064
02-Jul-14	Southwest	Juniper	Elliott Brook	7446	46.62143	-67.36754
02-Jul-14	Southwest	Juniper	Elliott Brook	5665	46.61567	-67.34233
03-Jul-14	Northwest	Northwest	Stoney Brook	3460	47.15280	-66.05680
03-Jul-14	Northwest	Northwest	Crawford stretch	3600	47.22728	-66.22957
03-Jul-14	Northwest	Northwest	South Branch	10660	47.25008	-66.39289
03-Jul-14	Northwest	Northwest	South Branch	6440	47.24985	-66.40220
03-Jul-14	Northwest	Northwest	North Branch	2800	47.27582	-66.44077
04-Jul-14	Southwest	Cains	Salmon Brook	3620	46.64462	-65.61314
04-Jul-14	Southwest	Cains	Salmon Brook	3640	46.63881	-65.63110
04-Jul-14	Southwest	Cains	East Branch Sabbies	3960	46.56364	-65.68284
04-Jul-14	Southwest	Cains	West Branch Sabbies	3620	46.51891	-65.74332
04-Jul-14	Southwest	Cains	Sling Dung Brook	3900	46.30610	-66.28322
04-Jul-14	Southwest	Cains	McKinley Brook	3720	46.29325	-66.28078
04-Jul-14	Southwest	Cains	North Cains	5420	46.33105	-66.34116
04-Jul-14	Southwest	Cains	Muzzeroll	5320	46.45929	-66.18999
04-Jul-14	Southwest	Cains	Mahoney Brook	3090	46.50875	-65.87188
04-Jul-14	Southwest	Cains	Otter Brook	3090	46.64071	-65.75723
11-Jul-14	Southwest	Clearwater	Clearwater Bridge	14153	46.66243	-66.77250
22-Jul-14	Northwest	LSW	Squaw Barren Brook	698	46.97314	-66.70038
22-Jul-14	Northwest	LSW	Country Line Brook	698	46.92731	-66.74187

Table 2. Distribution of first-feeding Atlantic salmon fry to satellite holding tanks for continued growth and stocking.

<b>Date</b>	<b>Stock Origin</b>	<b>Organization</b>	<b># of fish</b>	<b>Latitude</b>	<b>Longitude</b>
2-Jul-14	Juniper	Miramichi Headwaters Salmon Association	7168	46.51831	-67.17829
10-Jul-14	Burnthill	J.D. Irving	28534	46.55475	-67.16395
11-Jul-14	Clearwater	MSA and Clearwater and Rocky Bend Camps	10171	46.63315	-66.75891

Table 3. Distribution of brook trout parr to satellite tanks for continued growth and stocking.

<b>Date</b>	<b>Stock Origin</b>	<b>Organization</b>	<b># of fish</b>	<b>Latitude</b>	<b>Longitude</b>
5-Jun-14	Juniper	Miramichi Headwaters Salmon Association	4000	46.51831	-67.17829
9-Jun-14	Beadle Brook	J.D. Irving	17810	46.55475	-67.16395