

## **Miramichi Salmon and Trout Restoration – Stocking 2018**

*Prepared by:*  
Kelsey McGee  
Field Biologist  
Miramichi Salmon Association  
September 6<sup>th</sup>, 2018

## **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 could destroy a redd, 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 number 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. However, there are still locations that raise fall fingerlings for stocking purposes. Atlantic salmon and brook trout fry were raised this year in satellite rearing stations run in collaboration with J.D. Irving Ltd. and the Miramichi Headwaters Salmon Federation. The objective of the stocking program is to improve Atlantic salmon production in the headwaters of the Miramichi watershed.

The number of broodstock collected from the Northwest system was decreased in 2015 because of a new initiative, which would see a decreased need for stocking on this branch. The Collaboration for Atlantic Salmon Tomorrow (CAST) initiative began in 2014 with plans to collect smolts from the Northwest Miramichi River and grow them at the Miramichi Salmon Conservation Centre (MSCC) until maturity, after which they would be released to spawn naturally in the wild. Smolt to adult survival has decreased in the last decade, resulting in a decreased number of adults returning to the river. This part of the CAST initiative would increase the number of spawning adults in the Northwest Miramichi.

## Methods

Adult salmon were collected from September to mid-October 2017 for broodstock from 5 tributaries on the Miramichi River – Sevogle River, Clearwater Brook, Burnthill Brook, the Main Southwest River in Juniper, and the Cains River. These fish were held at the MSCC and 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 in trays until the eyed stage, when dead eggs were removed daily. Eyed eggs were transferred to upwelling incubation boxes in preparation for hatching. After hatching, fry were fed a formulated salmonid diet (Skretting Nutra XP 0.5/0.7) for approximately 5 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. Additional salmon fry were taken to satellite rearing sites for continued growth before stocking.

## **Results**

Approximately 102,500 first-feeding Atlantic salmon fry were stocked into 40 sites in 3 tributaries of the Miramichi River (Figure 1 and Figure 2). The Northwest system received 12,000 fry and the Southwest system 90,500 (Table 1a&b). An additional 55,000 fry were taken to satellite holding tanks for future release by local conservation groups (Table 2). Furthermore, 7,057 brook trout fry were distributed to a satellite tank rearing location (Table 3).

## **Acknowledgements**

The MSA would like to thank the following groups for their support with this project:

- J.D. Irving Ltd. (rearing salmon and trout fry for fall distribution)
- Miramichi Headwaters Salmon Federation (rearing salmon fry for fall distribution)

Table 1a. Distribution of first-feeding Atlantic salmon fry from the Miramichi Salmon Conservation Centre in 2018 on the Northwest branch of the Miramichi River.

<b>Branch</b>	<b>Stock Origin</b>	<b>Site</b>	<b># of fish</b>	<b>Latitude</b>	<b>Longitude</b>
<b>Northwest</b>	SEV	Sheephause Brook	2000	47.08032	-66.02063
<b>Northwest</b>	SEV	Little Sheephause Brook	2000	47.09533	-66.06610
<b>Northwest</b>	SEV	Travis Brook	2000	47.04454	-66.22082
<b>Northwest</b>	SEV	Johnston Brook	2000	47.04835	-66.22823
<b>Northwest</b>	SEV	Barracks Brook	4000	47.07144	-66.29350

Table 1b. Distribution of first-feeding Atlantic salmon fry from the Miramichi Salmon Conservation Centre in 2018 on the Southwest branch of the Miramichi River.

<b>Branch</b>	<b>Stock Origin</b>	<b>Site</b>	<b># of Fish</b>	<b>Latitude</b>	<b>Longitude</b>
Southwest	JUN	MSW South Branch	2500	46.51832	-67.17802
Southwest	JUN	Lake Brook 1	2500	46.52872	-67.30836
Southwest	JUN	Beaver Brook	2500	46.54557	-67.25680
Southwest	JUN	Big Teague Brook 1	2500	46.55782	-67.23327
Southwest	JUN	MSW South Branch 1	2500	46.55424	-67.24503
Southwest	JUN	Big Teague Brook 2	2500	46.57346	-67.24913
Southwest	JUN	Little Teague Brook 1	2500	46.59091	-67.26986
Southwest	JUN	Elliott Brook 3	2500	46.58252	-67.30682
Southwest	JUN	Little Teague Brook 2	2500	46.61014	-67.29575
Southwest	JUN	Elliott Brook 2	2500	46.61554	-67.34232
Southwest	JUN	Elliott Brook 1	2500	46.62121	-67.36756
Southwest	JUN	Little Teague Brook 3	2500	46.63517	-67.31507
Southwest	JUN	Juniper Brook	2500	46.53901	-67.18600
Southwest	JUN	Wiley Brook	2500	46.54035	-67.30801
Southwest	JUN	Lake Brook 3	2500	46.51888	-67.33205
Southwest	JUN	Lake Brook 4	2500	46.52052	-67.33271
Southwest	CAINS	Sabbies 1	2500	46.61304	-65.59956
Southwest	CAINS	Sabbies Bridge	2500	46.5812	-65.59464
Southwest	CAINS	Sabbies 3	2500	46.51913	-65.74319
Southwest	CAINS	Millets road	2500	46.25182	-65.757819
Southwest	CAINS	Six Mile 1	2500	46.49404	-65.800424
Southwest	CAINS	Ten Mile Trib.	2500	46.421914	-65.987598
Southwest	CAINS	Ten Mile Brook	2500	46.411336	-65.998845
Southwest	CAINS	Blue Rock Brook	2500	46.383036	-65.07138
Southwest	CAINS	Branch Off Muzzelerol	2500	46.497929	-66.073564
Southwest	CAINS	North Cains Branch	2500	46.337663°	-66.322352°
Southwest	CAINS	Main Cains River	2500	46.318824°	-66.288830°
Southwest	CAINS	McKenzie Brook	2500	46.457166	-66.012158
Southwest	CAINS	Cains 2	2500	46.499989	-65.873058
Southwest	CAINS	Mahoney Brook	2500	46.509094	-65.871673
Southwest	CAINS	Brads Camp	2500	46.50598	-65.873058
Southwest	CAINS	Found Brook	2500	46.553311°	-65.821549°
Southwest	CAINS	Lythco Brook	2500	46.558013°	-65.810058°
Southwest	CAINS	Main Cains 2	5500	46.434783°	-66.018785°
Southwest	CAINS	Tylers Camp	2500	46.559639	-65.804227

Table 2. Distribution of first-feeding Atlantic salmon fry to satellite holding tanks for continued growth and stocking in 2018.

<b>Stock Origin</b>	<b>Organization</b>	<b># of fish</b>	<b>Latitude</b>	<b>Longitude</b>
Juniper	Miramichi Headwaters Salmon Association	15000	46.51831	-67.17829
Clearwater	J.D. Irving Ltd.	17500	46.55475	-67.16395
Burnthill	J.D. Irving Ltd.	22500	46.55475	-67.16395

Table 3. Distribution of brook trout fry to satellite tanks for continued growth and stocking in 2018.

<b>Stock Origin</b>	<b>Organization</b>	<b># of fish</b>	<b>Latitude</b>	<b>Longitude</b>
Juniper	Miramichi Headwaters Salmon Association	1725	46.51831	-67.17829
Beadle Brook	J.D. Irving Ltd.	5332	46.55475	-67.16395

Figure 1. Stocking sites of salmon fry distributed on the Northwest Miramichi River in 2018.

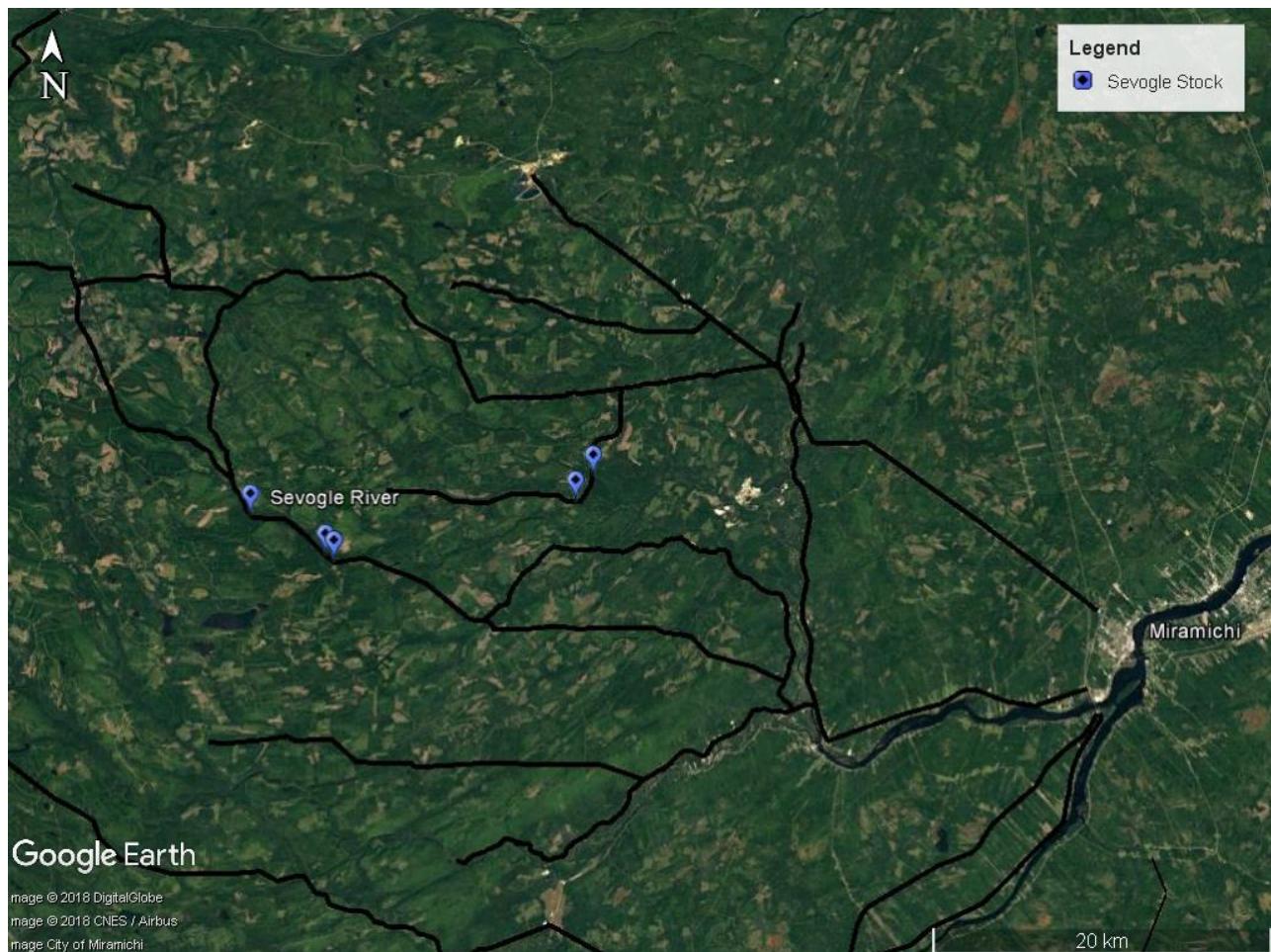


Figure 2. Stocking sites of salmon fry distributed on the Southwest Miramichi River in 2018.

