

Miramichi Salmon and Trout Restoration – Stocking 2019

Prepared by:
Holly Labadie
Biologist
Miramichi Salmon Association
8 June 2021

Introduction

Stocking Atlantic salmon (*Salmo salar*) first-feeding fry can improve the juvenile production capacity of the Miramichi River by targeting areas that are under-seeded or inaccessible 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 suboptimal water conditions. Areas with zero/minimal fry present are targeted to stock and efforts are made to identify and remove any impediments to natural spawning. Most of these areas are in small tributaries in 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 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/100m² is not considered for stocking as it appears to reflect a healthy natural population. Sites with less than 50 fry/100m² are considered candidates for stocking. The absence of fry at a previously 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 focus from stocking Atlantic salmon fall fingerlings to stocking first-feeding salmon fry in the early summer. These fry are incubated as eggs on brook water to ensure the rate of 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 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.

Salmon and brook trout fry were raised this year in satellite rearing stations run in collaboration with the Miramichi Headwaters Salmon Federation and J.D. Irving Ltd. The objective of the stocking program was to improve Atlantic salmon production in the headwaters of the Miramichi watershed.

The number of broodstock collected from the Northwest Miramichi River 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. This program is called “Smolt to Adult Supplementation”, or SAS. Smolt to adult survival has decreased in the Miramichi River in the last decade, resulting in fewer adults returning to the river. This part of the CAST initiative would increase the number of spawning adults in the Northwest Miramichi River. A permit was not issued to released mature adults in 2018 so these fish were spawned at the hatchery and their SAS fry were released in 2019 along with the wild fry collected from wild broodstock in 2018.

Methods

Wild adult salmon were collected from September to October 2018 for broodstock from 3 tributaries on the Miramichi River – the Northwest River, 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. In the fall of 2018 however, a female grilse was misidentified as a male grilse from Juniper, leaving us with no male fish from this area. Females from Juniper were spawned with a few males from the Cains River and these fry were stocked back in the Juniper area. Immediately following spawning, the wild adults were released back into the wild via Stewart Brook, which runs beside the MSCC. SAS adults at the hatchery, not permitted for release, were spawned in the same manner and then destroyed. Eggs from both groups 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 0.5mm/0.7mm) for approximately 5 weeks until stocking. All salmon fry were stocked into their native river of origin, with the exception of the Juniper females which were spawned with Cains males.

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 and trout fry were taken to satellite rearing sites for continued growth before stocking.

Results

Approximately 534,756 first-feeding Atlantic salmon fry were stocked into 40 sites in three tributaries of the Miramichi River (Figures 1a&b, Figure 2). The Northwest Miramichi River system received 53,128 wild fry (Table 1a) and 463,878 SAS fry (Table 1b). The Southwest Miramichi River system received 17,750 wild fry (Table 2). An additional 16,148 fry were taken to satellite holding tanks for future release by local conservation groups (Table 3). A further 5,550 brook trout fry were distributed to a satellite tank rearing location for future release (Table 4).

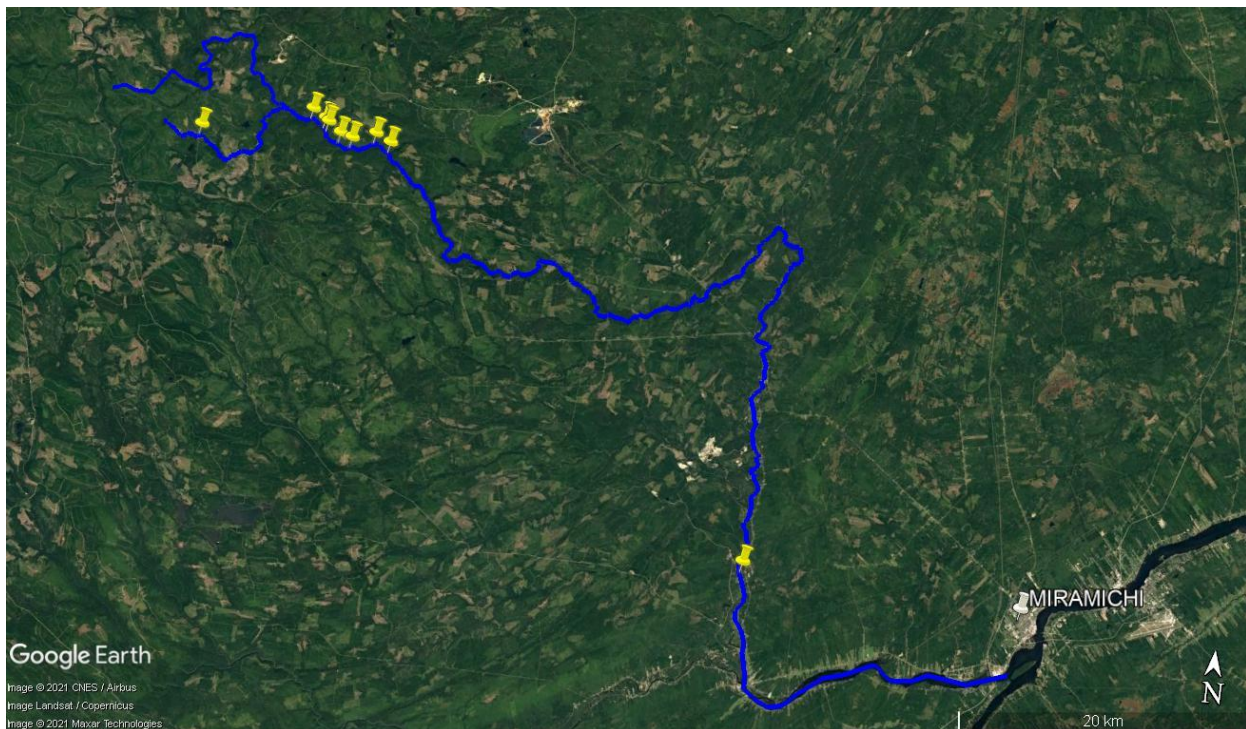


Figure 1a. Stocking sites of wild salmon fry distributed to the Northwest Miramichi River in 2019.

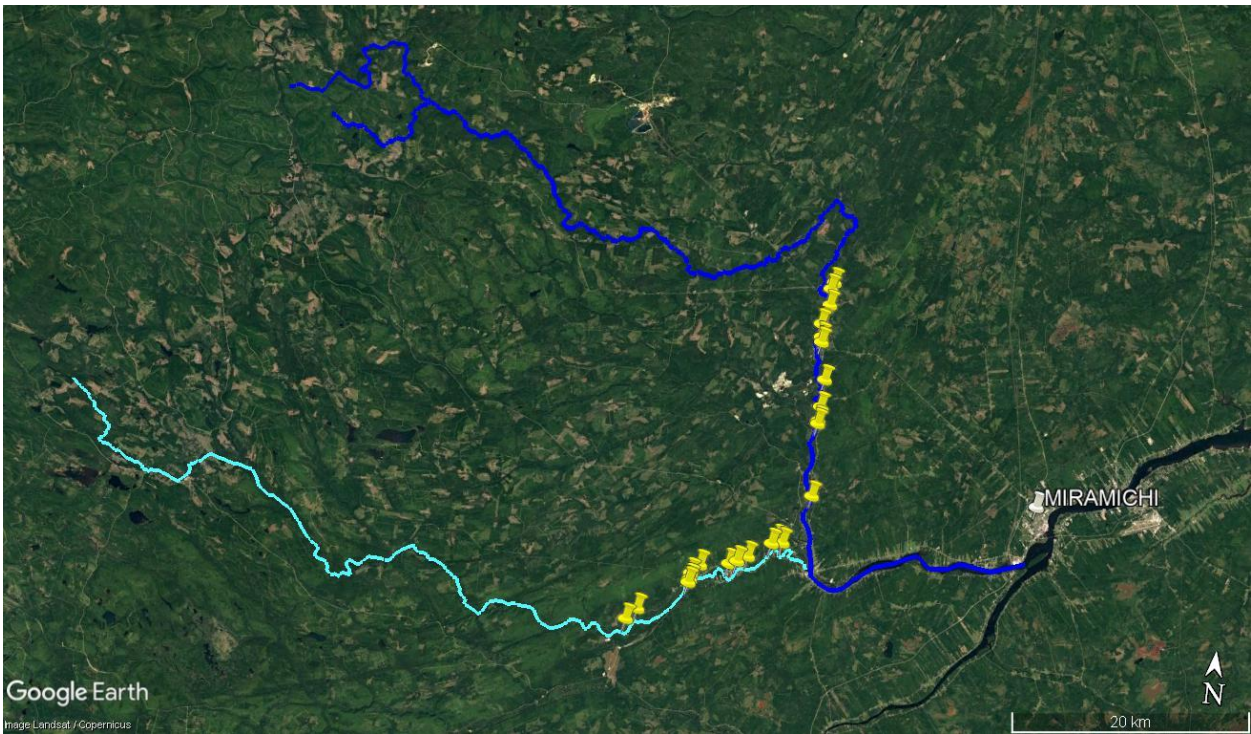


Figure 1b. Stocking sites of SAS salmon fry distributed to the Northwest and Little Southwest Miramichi Rivers in 2019.

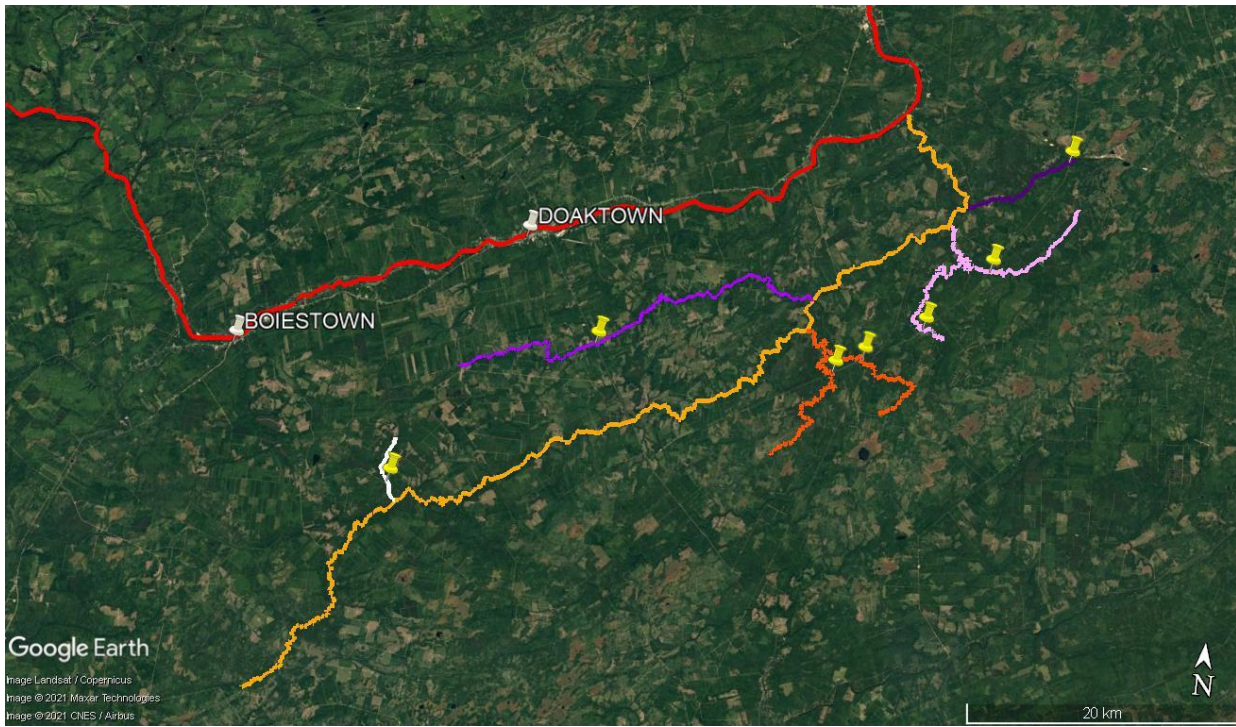


Figure 2. Stocking sites of wild salmon fry distributed to the Southwest Miramichi River in 2019.

Table 1a. Distribution of wild first-feeding Atlantic salmon fry from the Miramichi Salmon Conservation Centre to the Northwest Miramichi River system in 2019.

Stock Origin	Site	# of fish	Latitude	Longitude
NW Miramichi River	Herbie Bell Camp	30267	47.01237	-65.83740
NW Miramichi River	Spruce Lake Road	1318	47.24952	-66.39255
NW Miramichi River	Depot Camp	2939	47.25189	-66.21177
NW Miramichi River	Unnamed site 1	3060	47.25679	-66.22651
NW Miramichi River	Black and White Pool	3106	47.25224	-66.24859
NW Miramichi River	Unnamed site 2	3075	47.25454	-66.26012
NW Miramichi River	White Horse Pool	3106	47.26096	-66.27279
NW Miramichi River	Duncan Run Pool	3121	47.26285	-66.27593
NW Miramichi River	Split Rock Pool	3136	47.26821	-66.28915

Table 1b. Distribution of SAS first-feeding Atlantic salmon fry from the Miramichi Salmon Conservation Centre to the Northwest Miramichi River system in 2019.

Stock Origin	Site	# of fish	Latitude	Longitude
LSW Miramichi River	Upper Oxbow	22922	46.95413	-65.86006
LSW Miramichi River	Harris Brook Settlement Road 1	15020	46.92346	-65.95857
LSW Miramichi River	Harris Brook Settlement Road 2	15000	46.91889	-65.95895
LSW Miramichi River	Harris Brook Settlement Road 3	15040	46.91634	-65.96024
LSW Miramichi River	Dennis 1	25333	46.88367	-66.02506
LSW Miramichi River	Dennis 2	15289	46.89231	-66.01358
LSW Miramichi River	Halcomb	21278	46.93037	-65.94915
LSW Miramichi River	Zipline	16063	46.93384	-65.91726
LSW Miramichi River	Silikers ball field	20020	46.95620	-65.86586
LSW Miramichi River	Old Foot Bridge	25500	46.95274	-65.87204
LSW Miramichi River	Church Pool	19920	46.94097	-65.89697
LSW Miramichi River	Somers Bridge	25160	46.93650	-65.90839
NW Miramichi River	Baisley Road	15793	47.14058	-65.83340
NW Miramichi River	above Cable Pool	14864	47.15318	-65.83409
NW Miramichi River	Pat's Brook	15153	47.15842	-65.83087
NW Miramichi River	Kevin Harris camp	19903	46.99203	-65.83243
NW Miramichi River	Big Hole Camp	25249	47.04779	-65.83401
NW Miramichi River	Estey Lane	10250	47.06091	-65.83269
NW Miramichi River	Kingston Lane	20268	47.08215	-65.83094
NW Miramichi River	Glennford Copp	15192	47.11093	-65.83880

Table 1b. Continued.

Stock Origin	Site	# of fish	Latitude	Longitude
NW Miramichi River	First camp below Wayerton Bridge	25482	47.12585	-65.84013
NW Miramichi River	Second camp below Wayerton Bridge	20272	47.12512	-65.84123
NW Miramichi River	Footbridge Big Hole Camp	20940	47.05012	-65.83359
NW Miramichi River	Wendy Waye camp	23967	47.11485	-65.83969

Table 2. Distribution of wild first-feeding Atlantic salmon fry from the Miramichi Salmon Conservation Centre to the Southwest Miramichi River system in 2019.

Stock Origin/ Destination	Site	# of fish	Latitude	Longitude
Cains River	Sabbies East	2429	46.56355	-65.68254
Cains River	Sabbies West	2571	46.51906	-65.74319
Cains River	Six Mile East	2571	46.49436	-65.79993
Cains River	Six Mile West	2643	46.48299	-65.82768
Cains River	Muzzeroll Brook	2518	46.48430	-66.06210
Cains River	Otter Brook	2518	46.37607	-66.24838
Cains River	Salmon Brook	2500	46.64440	-65.61310

Table 3. Distribution of wild first-feeding Atlantic salmon fry to satellite holding tanks for continued growth and stocking in 2019.

Stock Origin	Organization	# of fish	Latitude	Longitude
Juniper	J.D. Irving Ltd.	16148	46.55475	-67.16395

Table 4. Distribution of brook trout fry to satellite tanks for continued growth and stocking in 2019.

Stock Origin	Organization	# of fish	Latitude	Longitude
Juniper	Miramichi Headwaters Salmon Federation	350	46.51837	-67.17819
Beadle Brook	J.D. Irving Ltd.	5200	46.55475	-67.16395

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 trout fry for fall distribution)