

Miramichi Salmon and Trout Restoration – Stocking 2015

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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/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 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 fry, young of the year brook trout, and yearling brook trout were raised this year in satellite rearing stations run in collaboration with J.D. Irving Ltd., the Miramichi Headwaters Salmon Federation, and Rocky Brook Camp & Barbour’s.

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 2014 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 (Corey 0.7CR/EWOS #1CR) 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

Approximately 231,313 first-feeding Atlantic salmon fry were stocked into 80 sites in seven tributaries of the Miramichi River (Figure 1). The Northwest system received 112,819 fry and the Southwest system 118,494 (Table 1). An additional 21,000 fry were taken to satellite holding tanks for future release by local conservation groups (Table 2). Additionally, 40,000 brook trout parr and 1,200 yearlings were distributed to two satellite tank rearing locations (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 and brook trout yearlings for fall distribution)
- Rocky Brook Camp & Barbour's (rearing salmon fry for fall distribution)
- White Rapids and Other Small Streams Enhancement Association (salmon fry stocking)

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

Branch	Stock Origin	Site	# of fish	Latitude	Longitude
Northwest	Sevogle	Johnston Brook	2544	47.04431	-66.22250
Northwest	Sevogle	Travis Brook	2621	47.04831	-66.22865
Northwest	Sevogle	Clearwater Brook	2502	47.10792	-66.23544
Northwest	Sevogle	SEV SB 1	2536	47.11050	-66.32037
Northwest	Sevogle	SEV SB 2	2556	47.08518	-33.60534
Northwest	Sevogle	SEV branch	1500	47.15705	-66.33582
Northwest	Sevogle	SEV NB Slack Lake	7615	47.20343	-66.32047
Northwest	Sevogle	SEV NB 1	2775	47.21760	-66.38605
Northwest	Sevogle	SEV NB 2	9232	47.20736	-66.35497
Northwest	Sevogle	SEV NB 3	2527	47.20560	-66.34550
Northwest	Sevogle	SEV NB Bear Lake	5136	47.21634	-66.25765
Northwest	Sevogle	Sheephouse Road	7047	47.13484	-65.98288
Northwest	LSW	North Pole Road @ bridge	2503	46.97046	-66.53089
Northwest	LSW	Smith Forks	2249	46.96208	-66.58373
Northwest	LSW	Squaw Barron Brook	1710	46.97311	-66.70039
Northwest	LSW	County Line Brook	1165	46.92739	-66.74204
Northwest	LSW	LSW 1	1943	47.04220	-66.76453
Northwest	LSW	LSW 4	938	46.98436	-66.51875
Northwest	NW	Crawford 1	2507	47.22731	-66.23008
Northwest	NW	Crawford 2	2552	47.25215	-66.21417
Northwest	NW	NW SB 1	2483	47.24985	-66.40220
Northwest	NW	NW SB 2	2591	47.25008	-66.39289
Northwest	NW	NW SB 3	2493	47.23538	-66.36326
Northwest	NW	NW NB 1	2709	47.27582	-66.44077
Northwest	NW	NW NB 2 (Bill Gray Mtn)	4995	47.28469	-66.38902
Northwest	NW	Trout Brook 1	2483	47.09631	-65.83664
Northwest	NW	Trout Brook 2	2535	47.09433	-65.83585
Northwest	NW	Pat's Brook 1	2512	47.18386	-65.84186
Northwest	NW	Pat's Brook 2	2446	47.18360	-65.84142
Northwest	NW	Stoney Brook	2493	47.15270	-66.05717
Northwest	NW	NW Main 3	2555	47.11620	-65.77396
Northwest	NW	Mountain Brook	3423	47.20321	-66.07328
Northwest	NW	Little River 1	2498	47.22708	-66.04102
Northwest	NW	Little River 2	2455	47.21888	-66.03860
Northwest	NW	Little River 3	9990	47.23083	-66.05357
Southwest	Rocky Brook	LL Road	17021	46.77917	-66.72535
Southwest	Rocky Brook	Below Fish Brook	12765	46.75488	-66.67578
Southwest	Rocky Brook	Brown Lake Bridge	8511	46.71358	-66.64512

Branch	Stock Origin	Site	# of fish	Latitude	Longitude
Southwest	Juniper	Juniper Brook	3021	46.53908	-67.18337
Southwest	Juniper	Teague 1	4605	46.58400	-67.26054
Southwest	Juniper	Teague 2	2995	46.57277	-67.24854
Southwest	Juniper	Teague 3	2986	46.55768	-67.23286
Southwest	Juniper	Elliott Brook 1	3021	46.62125	-67.36763
Southwest	Juniper	Elliott Brook 2	2992	46.61568	-67.34216
Southwest	Juniper	Elliott Brook 3	3018	46.58263	-67.30670
Southwest	Juniper	Little Teague 1	3040	46.61448	-67.30224
Southwest	Juniper	Little Teague 2	3000	46.59232	-67.27435
Southwest	Juniper	MSW Branch 1	3000	46.55526	-67.2879
Southwest	Juniper	MSW Branch 2	3008	46.54552	-67.25654
Southwest	Juniper	White Rapids Brook	500	46.769	-65.858
Southwest	Juniper	North Branch Hudson Brook	100	46.754	-65.846
Southwest	Juniper	South Branch Hudson Brook	100	46.757	-65.844
Southwest	Juniper	Main Hudson Brook	100	46.758	-65.845
Southwest	Juniper	Smith Lake Outlet	500	46.782	-65.815
Southwest	Juniper	Hallihan Brook	100	46.712	-65.819
Southwest	Juniper	Brandy/Mersereau Brook	50	46.692	-65.842
Southwest	Juniper	Zack's Brook	100	46.674	-65.847
Southwest	Juniper	Morse Brook	300	46.668	-65.849
Southwest	Juniper	Four Mile Brook	150	46.609	-66.079
Southwest	Juniper	Fowler Meadow Brook	150	46.619	-66.108
Southwest	Juniper	Ledbetters Brook	150	46.619	-66.112
Southwest	Juniper	Davis Landing Brook	100	46.590	-66.229
Southwest	Juniper	Big Hole Brook	500	46.593	-66.319
Southwest	Juniper	South Branch Big Hole Brook	100	46.572	-66.358
Southwest	Juniper	North Br. Bartholomew River	1000	46.625	-66.326
Southwest	Juniper	South Br. Bartholomew River	1000	46.616	-66.327
Southwest	Cains	Tyler's Camp	2512	46.55928	-65.80551
Southwest	Cains	Mahoney Brook	598	46.50875	-65.87188
Southwest	Cains	Brad's Camp	2000	46.50561	-65.87334
Southwest	Cains	Salmon Brook 1	2520	46.64459	-65.61313
Southwest	Cains	East Branch Sabbies	2559	46.56364	-65.68284
Southwest	Cains	West Branch Sabbies	2437	46.51891	-65.74332
Southwest	Cains	East Branch Six Mile	2437	46.49400	-65.80071
Southwest	Cains	West Branch Six Mile	2547	46.48274	-65.82861
Southwest	Cains	Cains tributary	1023	46.41129	-65.99825
Southwest	Cains	Otter Brook	2001	46.64071	-65.75723
Southwest	Cains	North Cains 1	1771	46.33765	-66.32243

Branch	Stock Origin	Site	# of fish	Latitude	Longitude
Southwest	Cains	North Cains 2	1772	46.33103	-66.34133
Southwest	Clearwater	Clearwater Bridge	8931	46.65402	-66.76901
Southwest	Clearwater	Christiana Pool	7403	46.66230	-66.77250

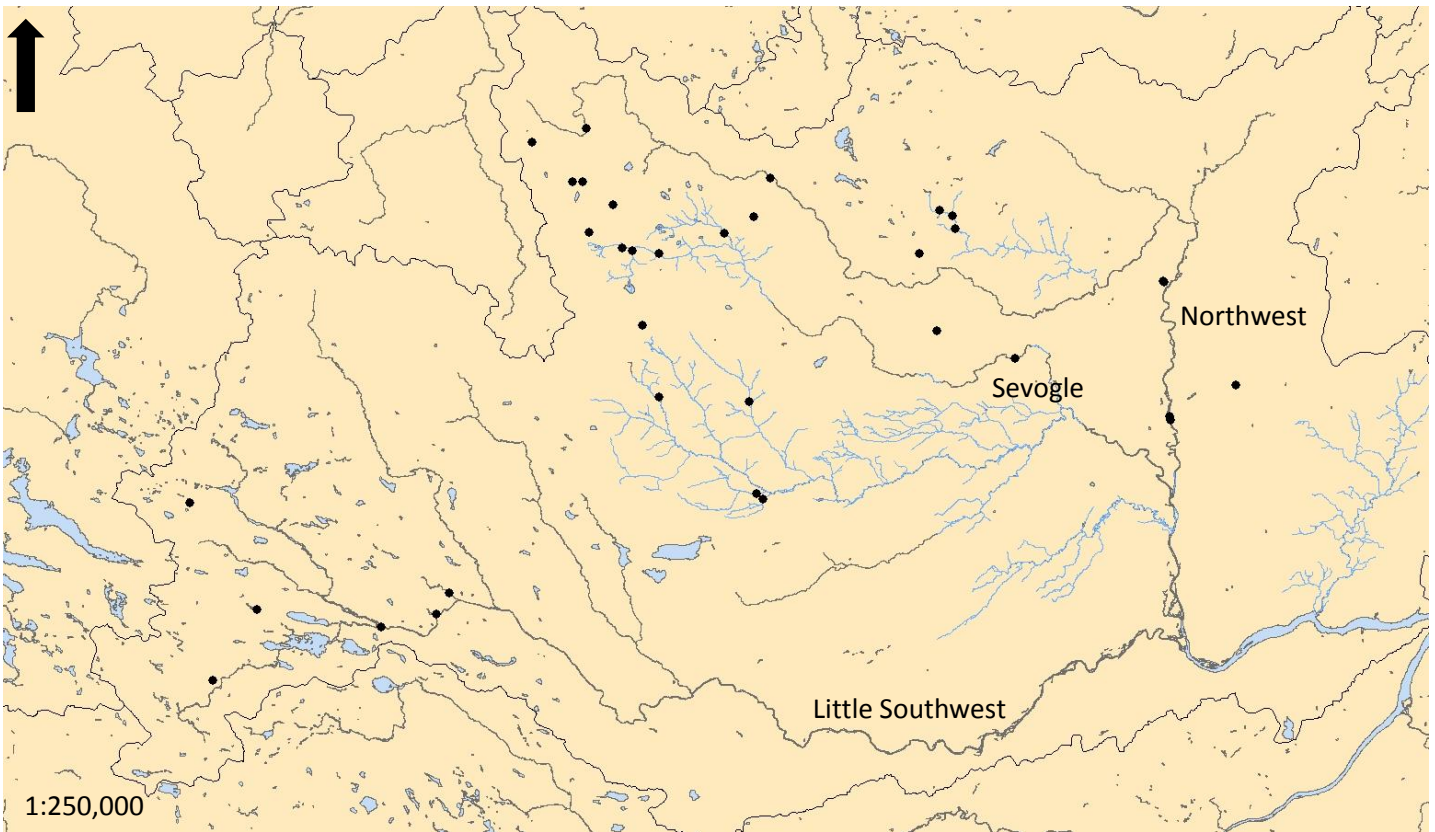
Table 2. Distribution of first-feeding Atlantic salmon fry to satellite holding tanks for continued growth and stocking.

Stock Origin	Organization	# of fish	Latitude	Longitude
Juniper	Miramichi Headwaters Salmon Association	6000	46.51831	-67.17829
Clearwater	J.D. Irving Ltd.	10000	46.55475	-67.16395
Clearwater	MSA and Clearwater and Rocky Bend Camps	5000	46.63315	-66.75891

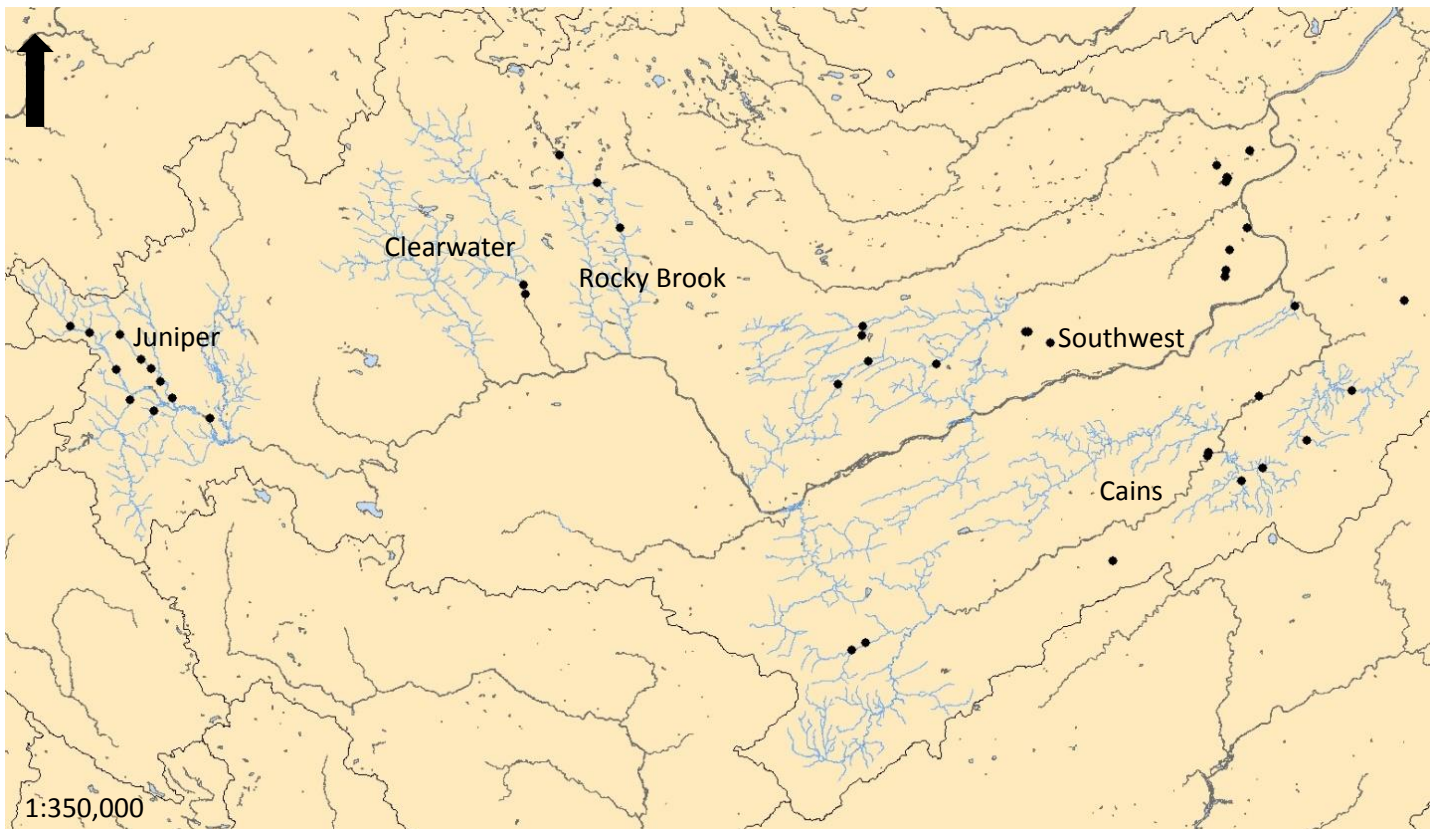
Table 3. Distribution of brook trout parr and yearlings to satellite tanks for continued growth and stocking.

Stock Origin	Organization	# of fish	Latitude	Longitude
Beadle Brook	J.D. Irving Ltd.	40000	46.55475	-67.16395
Moose Lake	Miramichi Headwaters Salmon Association	1200	46.51831	-67.17829

Figure 1. Stocking sites of salmon fry distributed on the Northwest (a) and Southwest (b) Miramichi Rivers in 2015.



(a)



(b)