

Miramichi Salmon and Trout Restoration- Stocking 2013  
Final Report

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## **Introduction**

Stocking Atlantic salmon early-feeding fry can improve the juvenile production capacity of the Miramichi River by targeting areas with juvenile densities lower than their production potential. Low fry or parr numbers in a stream system could be the result of multiple factors, including poor adult returns, barriers to adult movement into upper stream reaches, or stochastic environmental events such as ice scouring of redds or sub-optimal water temperature conditions. Fry abundance at a given location can act as an indicator of spawning success and year class recruitment of the previous year, whereas parr abundance can reflect spawning success from 2 or more years past. For example, a stream with high parr densities but very low fry densities could be the result of salmon being unable to access those waters during the most recent spawning season, but having access two or more years ago. Large annual variability in fry densities on small tributaries impacted by beaver is to be expected; high water levels in one year could wash out dams allowing for upstream access of spawning adults, while low water levels in other years would leave dams intact resulting in low or no egg deposition. Although fry numbers represent a strong reflection of adult spawning success and egg recruitment due to their tendency to occupy a relatively small habitat area, parr numbers are less directly tied to these factors as parr exhibit high mobility within streams.

In order to best target potential stocking locations the Miramichi Salmon Association (MSA) uses data collected during the previous year from two separate annual electrofishing programs. Electrofishing data used for the planning and implementation of the 2013 stocking program can be found in the Miramichi Salmon Association Conservation Report 2012. Using this information is important for several reasons. The Miramichi Salmon Conservation Center (MSCC) has a large but limited capacity to produce salmon fry, which is highly dependent on the success of our broodstock collection program which can vary significantly between years due to success or failure to attain sufficient spawning adults. Since it is impossible to stock every small stream in the Miramichi with a limited number of fish it is important to place hatchery reared salmon fry into streams which will benefit most from their introduction. Conversely, stocking salmon fry into a tributary with high salmon fry abundance could actually result in a net negative effect by increasing the level of competition between fry for limited food resources in streams that are often moderately to highly oligotrophic. To avoid overstocking a location, any site

containing more than 100 fry per 100m<sup>2</sup> is not considered for stocking as it appears to reflect a healthy natural population. Sites with less than 50 fry per 100m<sup>2</sup> are considered candidates for further stocking. 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 were identified by an adipose clip (removal of the adipose fin). In 2010 the Miramichi Salmon Association shifted the focus from Atlantic salmon fingerlings in the fall to stocking first-feeding salmon fry in the early summer. These feeding 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 of a hatchery environment, and the improved capacity to develop 'wild' behavior tendencies at a younger age. Early-feeding fry are stocked in June or early July at an average size of 0.5 grams, which makes fin clipping of these fish impossible to achieve.

In addition to Atlantic salmon fry, the MSA stocked two strains of brook trout into various locations throughout the Southwest Miramichi. First generation Beadle Brook sea run trout were raised at the MSCC until reaching the size of fry, and were then transported to a satellite tank operated by JD Irving Ltd for continued growth before stocking. Additionally, young of the year brook trout from a domestic hatchery strain originating from Moose Lake, NB, were released into several locations within the Southwest watershed.

## **Methods**

Adult salmon were collected by means of seining and fyke netting from 7 separate watercourses within the Miramichi River system from September to mid-October in 2012. Captured salmon were brought to the MSCC where they were kept and checked regularly for readiness to spawn. Salmon were segregated into separate tanks based upon their river of origin to prevent accidental mixing of strains. Once ripe, female salmon were stripped of their eggs, which were fertilized by a male salmon from the same river system. Immediately following successful spawning, adult salmon were released into the wild via Stewart Brook, approximately 200m upstream of the Northwest Miramichi. 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 of

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”).

Sites selected for stocking were chosen based on the low juvenile densities found at the exact or nearby locations from 2012 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 May 17<sup>th</sup> to June 28<sup>th</sup> 2013, approximately 87,394 young of the year brook trout were stocked into 9 locations (Table 1). A total of 268,652 early-feeding Atlantic salmon fry were released into 43 locations in tributaries and main river locations of the Miramichi River (Table 2). 26 sites on the Northwest Miramichi River were stocked with a total of 129,369 salmon fry, and 17 sites on the Southwest Miramichi River were stocked with a total of 139,283 salmon fry. In 2013 the Miramichi Headwater Salmon Federation (MHSF) were able to accommodate a high number of salmon in their rearing tank facility, stocking a total of 29,000 salmon fry into 7 locations in the head waters area (Table 4.). 55,942 salmon fry (including the MHSF) and 17,852 brook trout fry were taken to satellite holding tank for future release by local conservation groups (Table 3). Total salmon stocked on the Miramichi in 2013 was 307,727, with a total trout stocked at 105,246.

Table 1. Numbers and distribution of brook trout fry from the Miramichi Salmon Conservation Center

Date	Stock	River	Origin	Stocking Location	# Fish	Lat.	Long.
17-May-13	Domestic	SW Miramichi	Moose Lake	Quarryville Bridge	5000	46.828	65.787
17-May-13	Domestic	SW Miramichi	Moose Lake	Blackville Park	5000	46.735	65.827
17-May-13	Domestic	SW Miramichi	Moose Lake	Doaktown Bridge	5000	46.559	66.122
17-May-13	Domestic	SW Miramichi	Moose Lake	Burntland Bridge	8323	46.46	66.412
27-May-13	Domestic	SW Miramichi	Moose Lake	Betts Mill Bk - Rt 8	6250	46.538	66.183
27-May-13	Domestic	SW Miramichi	Moose Lake	Upper Blackville Bridge	20625	46.619	65.878
29-May-13	Domestic	SW Miramichi	Moose Lake	Bloomfield Bridge	17961	46.483	66.483
04-Jun-13	Domestic	SW Miramichi	Moose Lake	Juniper @ Juniper Station	10000	46.55	67.19
04-Jun-13	Domestic	SW Miramichi	Moose Lake	Divide Rd @ Argyle crossing	9235	46.52	67.34

Table 2. Numbers and distribution of first feeding Atlantic salmon fry from the Miramichi Salmon Conservation Center

Date	Sub-basin	Stock Origin	Site	# Fish	Lat.	Long.
02-Jul-13	SW Miramichi	Rocky Brook	Rocky Brook	26877	46.7795	66.7257
03-Jul-13	SW Miramichi	Cains	Salmon Brook	755	46.6448	65.6132
03-Jul-13	SW Miramichi	Cains	East Branch- 6 Mile	2500	46.6448	65.6132
03-Jul-13	SW Miramichi	Cains	Cains River @ Mahoney Camp	5000	46.5052	65.8733
04-Jul-13	SW Miramichi	Juniper	Juniper Bridge	10412	46.5489	67.2246
04-Jul-13	SW Miramichi	Juniper	Foreston Bridge	10412	46.5285	67.3083
04-Jul-13	SW Miramichi	Juniper	Juniper	10413	46.5205	67.3328
05-Jul-13	SW Miramichi	Clearwater	Clearwater River	36000	46.758	66.8407
11-Jul-13	SW Miramichi	Clearwater	White Rapids Bk @ Old Dam	4000	46.7912	65.8033
11-Jul-13	SW Miramichi	Clearwater	Morse Bk	3000	46.6681	65.8503
11-Jul-13	SW Miramichi	Clearwater	Moose-Donnolly Bk	2000	46.5579	65.9501
11-Jul-13	SW Miramichi	Clearwater	Donnolly	2000	46.5737	65.8903
11-Jul-13	SW Miramichi	Clearwater	Big Hole Brook	4000	46.5938	66.2986
11-Jul-13	SW Miramichi	Clearwater	Below Doaktown Bridge	4000	46.5706	66.0824
11-Jul-13	SW Miramichi	Clearwater	Mill Brook	1000	46.5719	66.0178
11-Jul-13	SW Miramichi	Clearwater	Infront of Museum	4000	46.5516	66.1446
11-Jul-13	SW Miramichi	Clearwater	Mill Brook	3000	46.4828	66.2065
10-Jul-13	NW Miramichi	LSW	Trib of Libby Brook	4000	46.8747	66.3315
10-Jul-13	NW Miramichi	LSW	Devils Brook Trib	4000	46.8743	66.2277
10-Jul-13	NW Miramichi	LSW	Devils Brook	5500	46.8736	66.2283
10-Jul-13	NW Miramichi	LSW	Upper Libbys	4000	46.8944	66.3917
10-Jul-13	NW Miramichi	LSW	Libbys Brook- Jim Boldons Rd	4000	46.9043	66.4029
10-Jul-13	NW Miramichi	LSW	Little North Pole	4000	46.9844	66.5187
10-Jul-13	NW Miramichi	LSW	Main Stem of LSW	5303	46.9705	66.5309
10-Jul-13	NW Miramichi	LSW	Squaw Barrow	4000	46.9731	66.7004
10-Jul-13	NW Miramichi	LSW	County Line Brook	4000	46.9273	66.742
10-Jul-13	NW Miramichi	LSW	Crooked Brook Tuadook	4000	46.9149	66.776
10-Jul-13	NW Miramichi	LSW	East Branch of West Branch	4000	47.0431	66.7653
08-Jul-13	NW Miramichi	NW	Fjord to Big Hole Camp	12000	47.0472	65.8334
08-Jul-13	NW Miramichi	NW	End of Kingston Lane	8000	47.0821	65.8303
08-Jul-13	NW Miramichi	NW	Trout Brook	4000	47.0943	65.8353
08-Jul-13	NW Miramichi	NW	Mouth of Pats Brook	8000	47.1575	65.8315
08-Jul-13	NW Miramichi	NW	Up on NW	8000	47.2149	65.8092
08-Jul-13	NW Miramichi	NW	Cross Wayerton	8000	47.151	65.8378
08-Jul-13	NW Miramichi	NW	Mountain Brook	8000	47.2032	66.0732
09-Jul-13	NW Miramichi	NW	NW Headwaters- Mtn Bill Gray	5000	47.5758	66.4434

09-Jul-13	NW Miramichi	NW	NW Headwaters	4308	47.2499	66.4021
09-Jul-13	NW Miramichi	NW	NW Headwaters- Near Spruce Lk	5000	47.2494	66.3926
09-Jul-13	NW Miramichi	NW	Tomogonops	4000	47.3262	66.054
09-Jul-13	NW Miramichi	NW	Tomogonops	4000	47.3052	66.0133
09-Jul-13	NW Miramichi	Sevogle	Barracks Bk	5000	47.0717	66.2938
09-Jul-13	NW Miramichi	Sevogle	Big South	5000	47.0932	66.3121
09-Jul-13	NW Miramichi	Sevogle	North Branch- Slack Lk Rd	4172	47.2039	66.3202

Table 3. Distributions to other organizations for continued growth and stocking

Delivery Date	Organization	Species	Stock Origin	# Fish
04-Jul-13	Miramichi Headwaters Salmon Federation	Atlantic Salmon	Juniper	32000
28-Jun-13	Miramichi Headwaters Salmon Federation	Brook Trout	Moose Lake	2500
28-Jun-13	Rocky Brook Camp	Atlantic Salmon	Juniper	10075
28-Jun-13	Rocky Brook Camp	Brook Trout	Moose Lake	3075
05-Jun-13	Irving	Brook Trout	Beedle Brook	12277
15-Jul-13	Friends of the Kouchibouguacis	Atlantic Salmon	Kouchibouguacis	6904
10-Jul-13	Elsipogtog 1st Nations	Atlantic Salmon	Richibucto	6963

Table 4. Numbers and distribution of first feeding fry by the Miramichi Headwaters Salmon Federation

Stock Origin	Location	# Fish	Lat	Long
Juniper	Juniper Bridge	5000	46.54888	67.22462
Juniper	Picnic area upstream of bridge	4500	46.54696	67.23041
Juniper	Big Teague Bridge	3900	46.5578	67.23321
Juniper	Little Teague Bridge	3900	46.59343	67.25243
Juniper	Beaufort Bridge	3900	46.55498	67.28764
Juniper	Elliot Brook	3900	46.56181	67.28935
Juniper	Lake Brook	3900	46.53031	67.30959

