Beaver Dam Management Report
2024

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Introduction

Beaver dams are known barriers to adult Atlantic salmon *(Salmo salar)* migrating upstream to spawn, blocking access to habitat in the upper reaches of brooks and streams (Taylor, *et al*., 2010). Female salmon have been observed below beaver dams in large numbers. These females are then forced to build multiple redds in confined areas of the stream, often with a habitat of lower quality than would otherwise be available above beaver dams (Mitchell and Cunjak, 2007). The survival of eggs in these crowded, overlapping redds is severely reduced and can negatively impact juvenile salmon production within the stream. Upstream areas of brooks and streams are often excellent spawning and juvenile habitat with a high percentage of gravel and cobble substrates, cold ground-fed water, and low numbers of predators. After several years of blocked access, these upstream reaches run the risk of becoming devoid of salmon fry and parr, potentially lowering the number of stream-imprinted adult salmon returning to these areas. Improving access to upstream habitat on individual streams could benefit egg survival and juvenile production.

To achieve the maximum benefit of dam-breaching efforts, the timing of behaviour changes and movements of salmon must be considered. In the Miramichi River, salmon typically begin moving out of large holding pools and travelling upstream to find spawning habitat from late September to late October. Salmon are likely to encounter beaver dams in these upstream areas with high populations of beavers. Small dams may not pose much of an issue during high water flows, as the fish are able to swim or leap over them, but large dams may restrict any further upstream movements. Beavers can repair active dams within a 24-48 hour time frame, meaning the notching or removal of the dams must be correctly timed with the upstream migrations of the salmon, so as not to waste time and resources.

Beaver dam removal initiatives by the Miramichi Salmon Association (MSA) have shown potential as a tool for salmon conservation. Several locations within the watershed have demonstrated improved juvenile counts after dams were notched during critical salmon migrations. For example, before 2006, very few salmon fry were found on Betts Mills Brook near Doaktown, NB, despite constructing a fish ladder just upstream from the mouth of the brook at a highway crossing. In 2006, a large beaver dam blocking the fish ladder was removed, and an additional 21 dams were notched or removed on the brook. This opened more than 50,000 m^2 of spawning habitat for salmon. Electrofishing results by the Department of Fisheries and Oceans (DFO) and MSA showed salmon fry present in Betts Mills Brook the following year (Reid, J. 2007). In another instance, Big Hole Brook (also near Doaktown) and Porter Brook (near Boiestown) both provide high-quality salmon habitat. With the removal of dams on these watercourses, adult salmon were able to access upstream sections, as observed by high densities of salmon fry the following year.

By providing access to crucial spawning habitat for adult Atlantic salmon in the Miramichi River, the MSA can ensure that a strong juvenile production rate is maintained. High numbers of juvenile salmon migrating to the ocean could potentially increase the number of adult salmon returning, improving the conservation outlook for this iconic Miramichi River species.

Methods

The Miramichi Salmon Association conducted ground reconnaissance on the Southwest Miramichi River watershed to locate and GPS beaver dams in the summer and autumn of 2024. The assessed locations were determined ahead of time and were based on previous dam management reports and known beaver dam areas.

The MSA field crew accessed and notched dams from September 30th to November 8th, 2024. Any dams discovered were marked with hand-held Garmin GPS units and mapped using Google Earth to coordinate ground crew activities. Dams were accessed on foot and notched when possible; low water levels this year prevented successful canoeing surveys to remove the impoundments. Active dams were notched on multiple occasions following repairs by beavers.

Permits

A Scientific Permit for Watercourse and Wetland Alteration (ALT 51881'20) was obtained prior to starting this project.

Results

In the Southwest Miramichi basin, 34 dams were breached by the field crew on 12 tributaries (Figure 1). Dams on Betts Mills Brook had to be breached on multiple occasions after beavers repaired them. A large dam located at the mouth was a high priority as the dam's height was over 4 meters, preventing any passage to spawning fish trapped at the base of the dam. All dams breached were recorded with names and GPS locations (Table 1).

Discussion

The Miramichi watershed has a large number of tributaries with beaver dam activities, and accessing and notching all dams is beyond current staff capacity. Beaver dam management in 2024 focused on vital salmon habitats that historically had high beaver activity. All dams were accessed on foot, as water levels were too low for canoeing in some areas.

The number of dams breached in 2024 (34) was lower than in recent years, whereas historic years recorded more than 100 dams notched in a season with increased resources (funding, staffing, helicopter surveys).

Although beaver activity was present throughout the watershed, levels of activity varied between locations along the river system. In certain areas of the Miramichi River system,

including Monaghan Brook, Muzeroll Brook, North Renous and Otter Brook, relatively low levels of beaver activity were observed. In contrast, Betts Mills Brook, Big Hole Brook, Doak Brook, and Sabbies River, had higher activity levels.

MSA completed thirteen electrofishing surveys in the summer of 2024 focused on areas upstream of beaver dams notched on the Southwest Miramichi River in 2023. Beavers can repair active dams within a 24-48 hour time frame, so the timing of notching/breaching dams is crucial in helping the fish access ideal spawning habitat. Field crews can only access and remove so many dams per day, and the efficiency of the beavers in repairing them can still pose problems for adult salmon migrating upstream to spawn.

In the summer of 2025, electrofishing surveys will be conducted upstream of dams breached/notched in 2024 to assess the program's impact on Atlantic salmon fry production.

Acknowledgements
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References
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Appendix

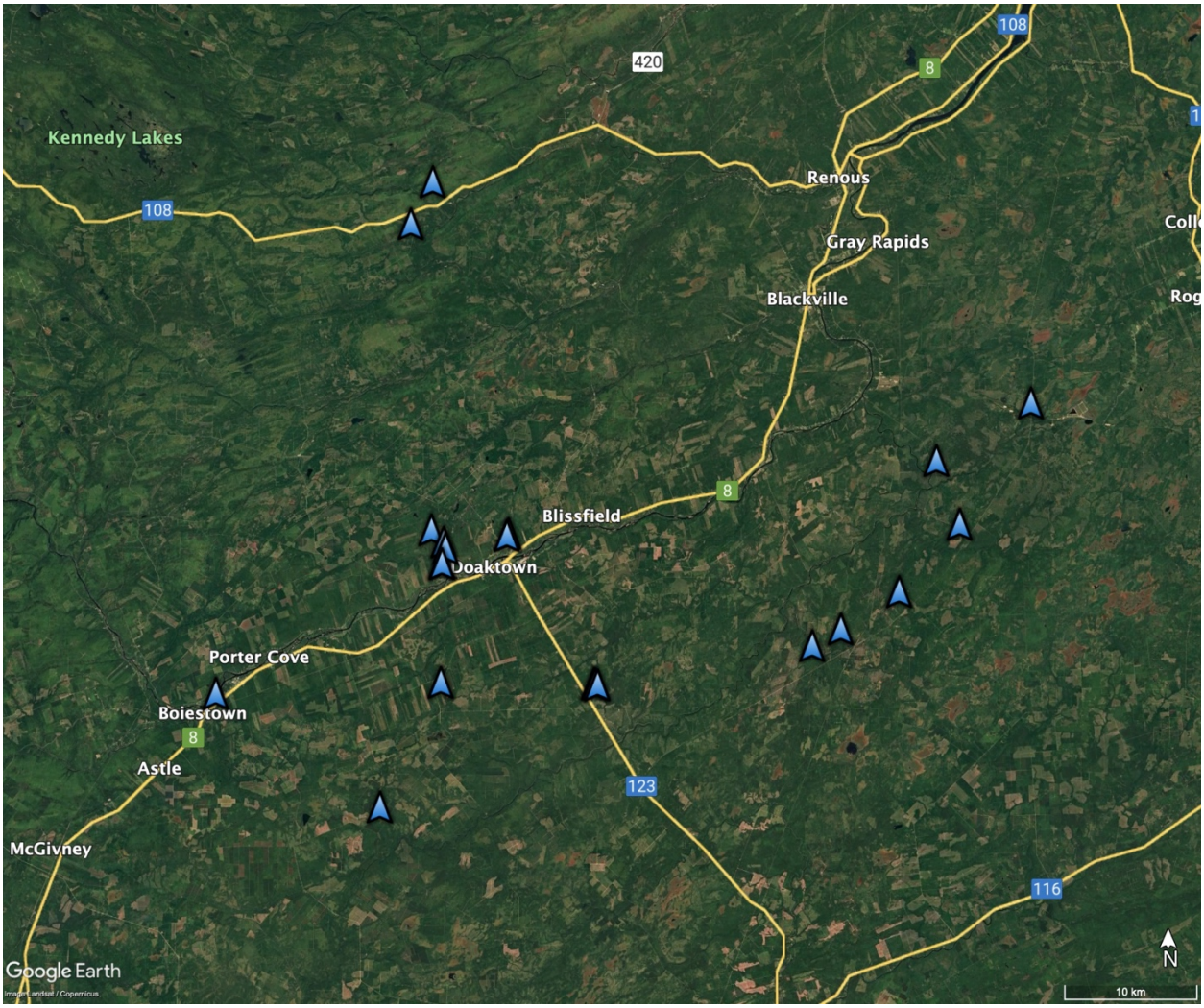

Figure 1: Tributaries of the Southwest Miramichi watershed. Beaver dams breached in 2024 are marked with a '▲'.

Table 1. GPS coordinates of breached beaver dams on the Southwest Miramichi River in 2024.

Watershed	Tributary	Latitude	Longitude
SW	Betts Mills Brook	46.538671	-66.187953
SW	Betts Mills Brook	46.538822	-66.188064
SW	Betts Mills Brook	46.538671	-66.187953
SW	Betts Mills Brook	46.538671	-66.187953
SW	Betts Mills Brook	46.538671	-66.187953
SW	Big Hole Brook	46.548981	-66.184404
SW	Big Hole Brook	46.561120	-66.198140
SW	Big Hole Brook	46.561120	-66.198140
SW	Big Hole Brook	46.548981	-66.184404
SW	Big Hole Brook	46.552934	-66.186339
SW	Burntland Brook	46.451517	-66.408040
SW	Burntland Brook	46.451517	-66.408040
SW	Doak Brook	46.557376	-66.124779
SW	Doak Brook	46.558600	-66.123240
SW	Doak Brook	46.558600	-66.123240
SW	Doak Brook	46.558600	-66.123240
SW	McKenzie Brook	46.457990	-66.039060
SW	McKenzie Brook	46.457374	-66.036738
SW	McKenzie Brook	46.458259	-66.040225
SW	Monaghan Brook	46.765805	-66.218398
SW	Muzeroll Brook	46.459240	-66.189049
SW	North Renous	46.793843	-66.196979
SW	Otter Brook	46.375821	-66.248199
SW	Sabbies River	46.519010	-65.743060
SW	Sabbies River	46.519010	-65.743060
SW	Sabbies River	46.519010	-65.743060
SW	Sabbies River	46.519010	-65.743060
SW	Sabbies River	46.519010	-65.743060
SW	Sabbies River	46.563881	-65.683737
SW	Salmon Brook	46.644620	-65.613240
SW	Salmon Brook	46.606505	-65.705919
SW	Salmon Brook	46.606505	-65.705919
SW	Six Mile Brook	46.483123	-65.827887
SW	Six Mile Brook	46.494223	-65.799964