



MULL RIVER RESTORATION PROJECT

2023

Abstract

This report talks about the stream habitat restoration project that was completed on the Mull River during the 2023 season. The Mull River was restored by installing 29 structures which consisted of several digger logs, deflectors, rock sill and bank stabilization done by hand work only. By the end of project completion, ISAA had successfully restored 27,187 square meters of aquatic habitat. .

Kailey Frenette, Claudia Poirier
invernessouthanglers@gmail.com

Acknowledgments

ISAA would like to thank and acknowledge all participants and all project partners who were involved in the Mull River Restoration Project this 2023 season. We simply would not be able to do the work we do without all the kindness and support from the government and non-governments organizations who invest in our work. We thank Nova Scotia Salmon Association, Department of Fisheries and Oceans Canada – Habitat Stewardship Program for Aquatic Species at Risk, and Atlantic Salmon Conservation Foundation for their contributions and continuous support.

Table of Contents

Acknowledgments.....	1
Mull River Restoration Project	3
History and Methodology	3
Equipment Used:.....	3
Maps	4
Directions to Project Site.....	5
Organization Information.....	6
Project Outcomes.....	7
In-Stream Restoration – Project Results	7
Project Photos.....	8
Summary	10

Mull River Restoration Project

History and Methodology

The Mull River has been divided into to four sub-watershed sections: headwaters, upper, middle, and lower. The sections of each watershed were divided based on topography, watershed size and restoration techniques that could be applied in each sub-watershed. Each sub-watershed was also divided into project reach sections for restoration management purposes.

During the 2023 season of stream habitat, ISAA continued restoration work on the Mull River Headwaters and restored 27,187.5 square meters of stream habitat in reach #1. Reach #1 is the lowest downstream reach in the headwaters section of the Mull River. This section had been negatively impacted by historic land use and resource extraction such as sawmill and grist mills. A survey was conducted and concluded that the channel had become over-widened to 10-12 meters and was likely channelized to align perpendicular to the roads on either side. As a result of poor forestry management practices, the channel had become over-widened with an approximate width of 10-12 meters. The over widened channel contributed to other habitat issues such as a lack of pooling area, meandering patterns, and spawning habitat. ISAA mitigated those impacts by installing 29 in-stream structures such as digger logs, deflectors, rock sills and bank stabilization work done by hand work. The bankfull width for the project location was calculated to be 12.5 meters, therefore the spacing between structures was 75 meters, restoring a stream length of 2,175 meters.

There was a total of 18 digger logs, 8 rock sills, 2 deflectors, and 1 bank logging structure for stabilization purposes. The angle of each structure, and placement of which side of the stream was determined by the natural characteristics of the stream. ISAA's goal was to enhance the existing habitat present within the stream, while also creating new habitat in areas that were lacking meandering patterns and pools. When creating the project design, it was decided to alternate the pool side for the digger logs and deflectors so sediments could be controlled to create gravel bars and create meandering within the river. In areas where there was poor log selection for digger logs, or bedrock for a substrate – ISAA installed rock sills using large boulder and cobble. These structures were installed on an angle to mimic the restoration work that a digger log would perform. The bank stabilization structure was installed in an area where there was poor riparian vegetation and bank erosion. ISAA started by installing two tiered logs and filled it in with rock, dirt, and tree debris. This structure will help deflect water away from the eroded area, and over time it will fill in with natural debris which will further stabilize the bank. All structures were strategically placed so they can cohesively work together to restore aquatic habitat such as Atlantic salmon and brook trout. ISAA expects for the structures to create pools, gravel bars and meandering patterns, and habitat for spawning fish.

Equipment Used:

- Maul
- Rebar
- Power drill with ¼ inch bit
- Spikes
- Power saw
- Grinder
- Shovels
- Pick
- Measuring tape
- Field book – write in the rain.
- GPS

Maps

The Mull River Headwaters is broken up into six project reach sections and is approximately 21.22 square kilometers in size. In 2023, ISAA restored stream habitat on project reach's one and two, see maps listed below for reference.



Figure 1. Map displaying the project reach sections in the headwaters of the Mull River watershed, 2023.

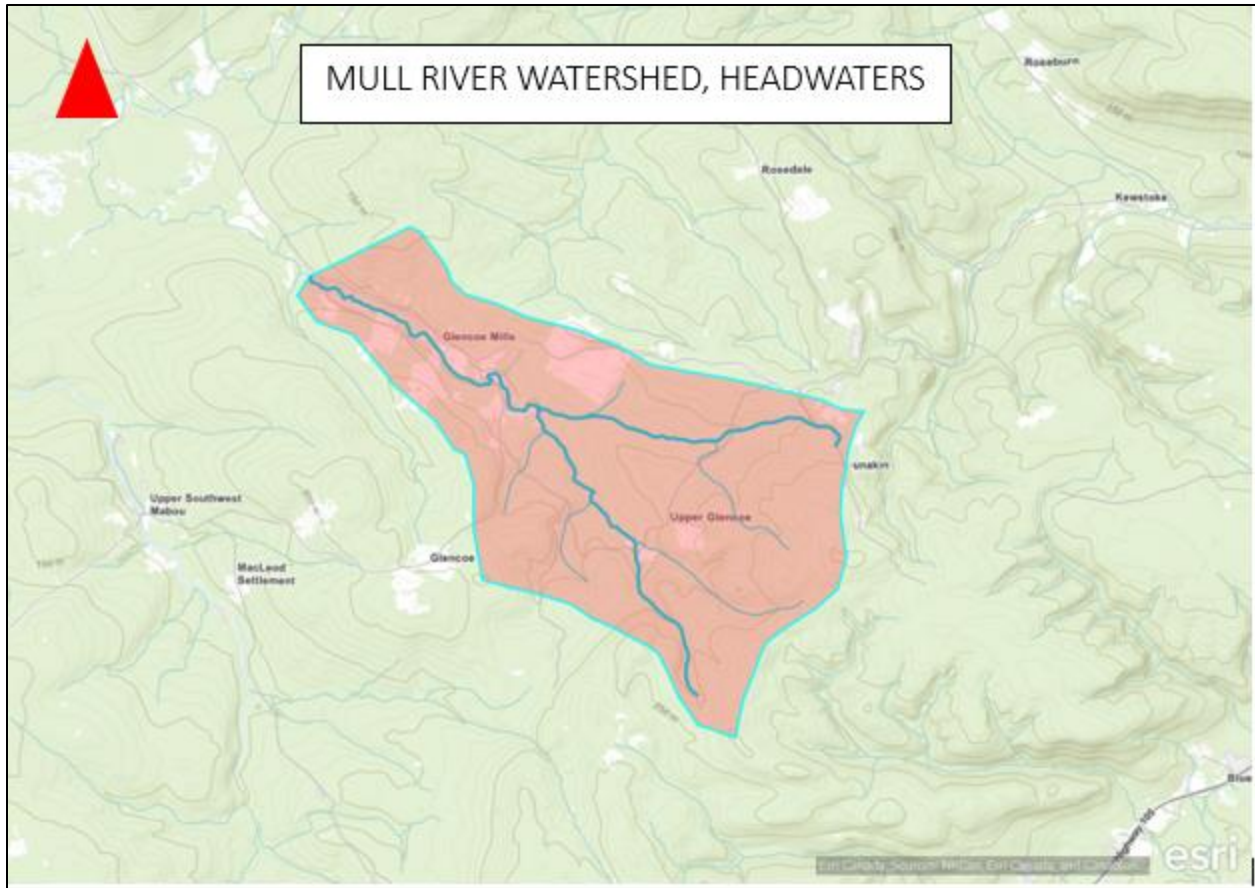
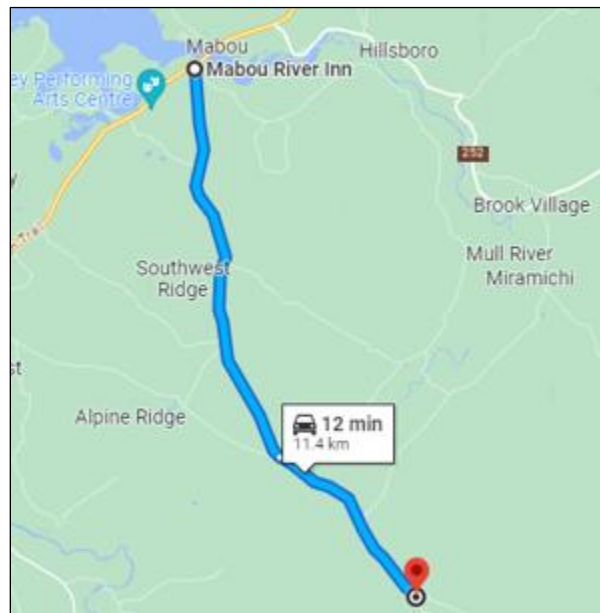


Figure 2. The watershed boundary for the Mull River headwaters, 21.22 square kilometers in size.

Directions to Project Site

- The project site is located in-between two dirt roads and can be easily accessed from either side. If anyone decides to visit the restoration project site from the 2023 season, the directions on how to do so is listed below starting from the Mabou River Inn, followed by a map. Starting from the Mabou River Inn, 19 SW Ridge Road, head towards Rankinville Rd (7.6 km)
- Continue onto Whycocomough Port Hood Rd (3.7km)
- Take a slight right onto Upper Glencoe Road until you meet the first bridge.
- The project site begins on the upstream side of the bridge.



Organization Information

GROUP NAME:	Inverness South Anglers Association
CONTACTS:	David Cameron, Board Chair Kailey Frenette, Watershed Coordinator Claudia Poirier, Field Technician
EMAIL(S):	David: dcameroncb@gmail.com Kailey: kaileymortensen@outlook.com Claudia: Claudia.d.poirier@gmail.com ISAA: invernessouthanglers@gmail.com
TELEPHONE:	Cell: (902)-258-5998
MAILING ADDRESS:	Mabou, Nova Scotia P.O. Box 255 BOE 1X0
WEBSITE:	www.riversandfish.ca https://www.facebook.com/InvernessSouthAnglers/
NUMBER OF EMPLOYEES	<u>Crew Members: 3 paid personnel</u> Nathan MacLean Michael Campbell Steven Beaton <u>Field Technicians: 2 paid personnel</u> Kailey Frenette Claudia Poirier
TOTAL WEEKS OF WORK	18 weeks total
START DATE:	May 29 th , 2023
END DATE:	September 30 th , 2023
OTHER PAID STAFF CONTRIBUTING TO THE PROJECT	Nicholas MacInnis, Planning and Technical Consultant
VOLUNTEERS	10
TOTAL VOLUNTEER HOURS	607

Project Outcomes

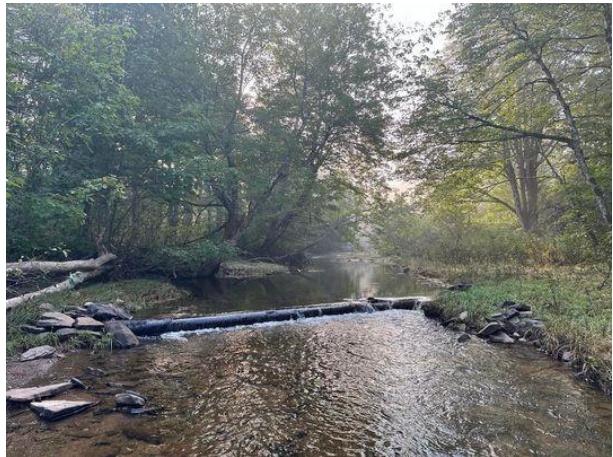
During the field season of stream habitat restoration on the Mull River, ISAA had successfully installed a total of 29 in-stream structures to restore habitat for Atlantic Salmon and Trout. A total length of 2,175 meters of stream habitat was restored. For more information regarding the project, please refer to the table below.

In-Stream Restoration – Project Results

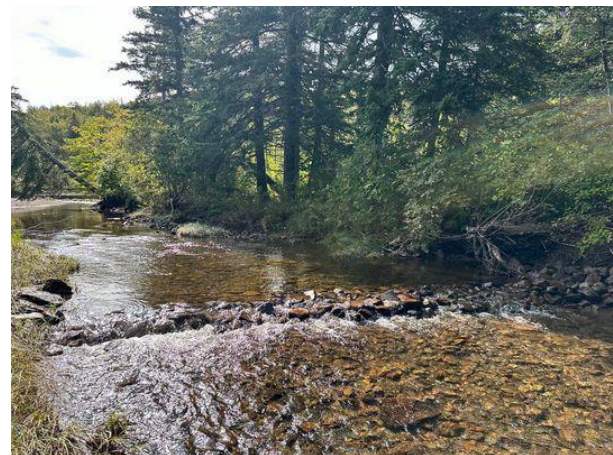
WATERCOURSE NAME	Mull River
WATERSHED NAME	Headwaters of the Mull River Watershed
ROAD ACCESS POINT	Upper Glencoe Rd
UPSTREAM PROJECT LIMIT LATITUDE DECIMAL DEGREES	N45° 58' 08.7"
UPSTREAM PROJECT LIMIT LONGITUDE DECIMAL DEGREES	W61° 19' 12.8"
DOWNSTREAM PROJECT LIMIT LATITUDE DECIMAL DEGREES	N45° 58' 44.9"
DOWNSTREAM PROJECT LIMIT LONGITUDE DECIMAL DEGREES	W61° 20' 31.8"
NUMBER OF STRUCTURES INSTALLED	29
TYPES OF STRUCTURES INSTALLED	Digger logs, deflectors, rock sills, and log wall for bank stabilization
DOMINANT SUBSTRATE	Cobble/Gravel
DESIGN WIDTH (m)	12.5 meters
STREAM HABITAT AREA RESTORED (m²)	27,187.5 m ²
STREAM HABITAT LENGTH RESTORED (m)	2,175 meters <i>or 2.175 km</i>
STRUCTURE SPACING (m)	75 meters

Project Photos

Before and after photos were taken of the Mull River Restoration Project that was completed in the Headwaters of the watershed in 2023. The before pictures were taken in early June during the project design phase and captured a downstream view of the structure sites. The after photos were taken at the end of the season in late September when the project was then completed. The after photos capture an upstream view of the project, which is why the before and after pictures look slightly different. The photos below will display one of each type of structure that was installed during the 2023 season of stream habitat restoration on the Mull River.



Before and after photo of the first digger log structure installed on the Mull River, 2023.



Before and after photo of a rock sill structure installed on the Mull River, 2023.



Before and after photo of a bank stabilization structure, built logs and hand rock, 2023.



Before and after photo of a deflector structure built on the Mull River, 2023.

Summary

Overall, the 2023 season went smooth, aside from some weather events such as wildfires and heavy rainfall which delayed some of our daily tasks. Throughout the months of June to September, ISAA successfully installed 29 structures throughout the Mull River Headwaters and restored 27,187.5 square meters of stream habitat.

Prior to any restoration activities, ISAA's field technicians had completed a Habitat Suitability Index Assessment (HSI) to collect baseline data at the restoration site. This helped identify what the pre-restoration habitat conditions were like and assessed the quality of habitat for Atlantic salmon and brook trout. A total of 15 sites were sampled throughout the restoration site and assessed many parameters such as water depths, bankfull and wetted widths, pools, substrate composition, spawning habitat etc. ISAA will continue their HSI assessments at each sample site every year for 5 years which will help quantify the impacts of their restoration efforts from 2023.

For future work, ISAA plans to continue restoration work downstream from the work completed in 2023. The section of the watershed ISAA will be targeting is a neighboring sub-watershed to the Headwaters and is known as the "Upper Section" of the Mull River. The project will involve the same type of work where ISAA will install in-stream structures such as digger logs, deflectors, and rock sills.