



# Salmonid Habitat Restoration

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Southwest Mabou River and Unnamed Tributary Installation Project

2020

Submitted by: Kailey Mortensen

Submitted to: Dave Cameron & Geoff Nishi

Date: December 2020

## TABLE OF CONTENTS

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Project Brief .....	3
Contact Information.....	3
Volunteers.....	3
Paid Personnel .....	4
Project Title.....	5
Site Location(s).....	5
Context Map .....	5
Directions To Site .....	6
Project Description .....	7
Southwest Mabou River.....	9
Location Information .....	9
Project Results .....	10
Structure Photos and Coordinates.....	11
Unnamed Tributary to the Southwest Mabou River .....	19
Location Information .....	20
Project Results: .....	21
Structure Photos and Coordinates.....	21

## PROJECT BRIEF

CONTACT INFORMATION	
<b>Group:</b>	Inverness South Anglers Association
<b>Contacts:</b>	David Cameron, Board Chair Geoff Nishi, Board Secretary Kailey Mortensen. Field Technician
<b>Email:</b>	David: <a href="mailto:dcameroncb@gmail.com">dcameroncb@gmail.com</a> Geoff: <a href="mailto:gknishi@sn.sympatco.ca">gknishi@sn.sympatco.ca</a> Kailey: <a href="mailto:kaileymortensen@outlook.com">kaileymortensen@outlook.com</a>  ISAA: <a href="mailto:invernesssouthanglers@gmail.com">invernesssouthanglers@gmail.com</a>
<b>Telephone:</b>	Cell: (902)-258-5998
<b>Mailing Address:</b>	Mabou, Nova Scotia P.O. Box 255 B0E 1X0
<b>Website:</b>	<a href="http://www.riversandfish.ca">www.riversandfish.ca</a>

VOLUNTEERS	
<b>Describe How Volunteers Contribute to your Adopt-A-Stream Project and to your Organization in General</b>	ISAA's volunteers contributed to the Adopt-A-Stream project and to the overall organization in several ways. The volunteer components include: Project Management (127.5 hrs) Accounting/Bookkeeping (390 hrs) Project Involvement (655 hrs) Committee Meetings (20 hrs) Trout Stocking and Salmon Brood Stock Collection (72 hrs and 48 hrs) Fishing Derby (220 hrs) NSLC Adopt-A-Stream
<b>Number of People Volunteering on All Aspects of the Project</b>	2 +
<b>Total Volunteer Hours</b>	1,532.5 hours
<b>Approximate Breakdown of Roles</b>	Both Dave Cameron and Geoff Nishi are board members of the Inverness South

	Anglers Association volunteer their time to organize and coordinate project activities for each season of Salmonid Habitat Restoration. Each project requires funding money and is obtained by the volunteers of ISAA with the help of Adopt-A-Stream. Both Dave and Geoff work together on project management, accounting/bookkeeping, taking part in committee meetings, stocking trout and collection of brood stock, organizing the annual fishing derby and much more.
<b>Management/Supervision</b>	Dave Cameron, and Geoff Nishi are both project managers for the Inverness South Anglers Association. Each volunteer approximately 127.5 hours of their time each year to project management.
<b>Labour</b>	N/A
<b>Other</b>	N/A

PAID PERSONNEL	
<b>Number of Project Workers</b>	<u>Crew Members: (4)</u> Nathan MacLean Michael Campbell Sandy Rankin Shaw Cameron  <u>Field Technician: (1)</u> Kailey Mortensen
<b>Total Tally Weeks of Work</b>	18 weeks total 5 weeks of winter damage assessments and remediation 13 weeks of new installation
<b>Start Date:</b>	July 1st, 2020
<b>End Date:</b>	September 30 <sup>th</sup> , 2020
<b>Other Paid Staff Contributing to the Project</b>	Charles MacInnis, Planning and Technical Consultant

PROJECT TITLE	
Salmonid Habitat Restoration – Southwest Mabou River and Unnamed Tributary Installation Project	

SITE LOCATION(S)	
<b>Watercourse(s):</b>	Southwest Mabou River, Unnamed Tributary
<b>Watershed(s):</b>	Mabou Harbour Watershed
<b>Location(s):</b>	MacLeod’s Settlement
<b>Nearest Community:</b>	Judique or Mabou
<b>Road Crossing(s):</b>	Unnamed Road off MacLeod’s Settlement Road

**Context Map:**

The context map seen below is a Google Earth image of site location in MacLeod’s Settlement within the Mabou Harbour Watershed boundary.

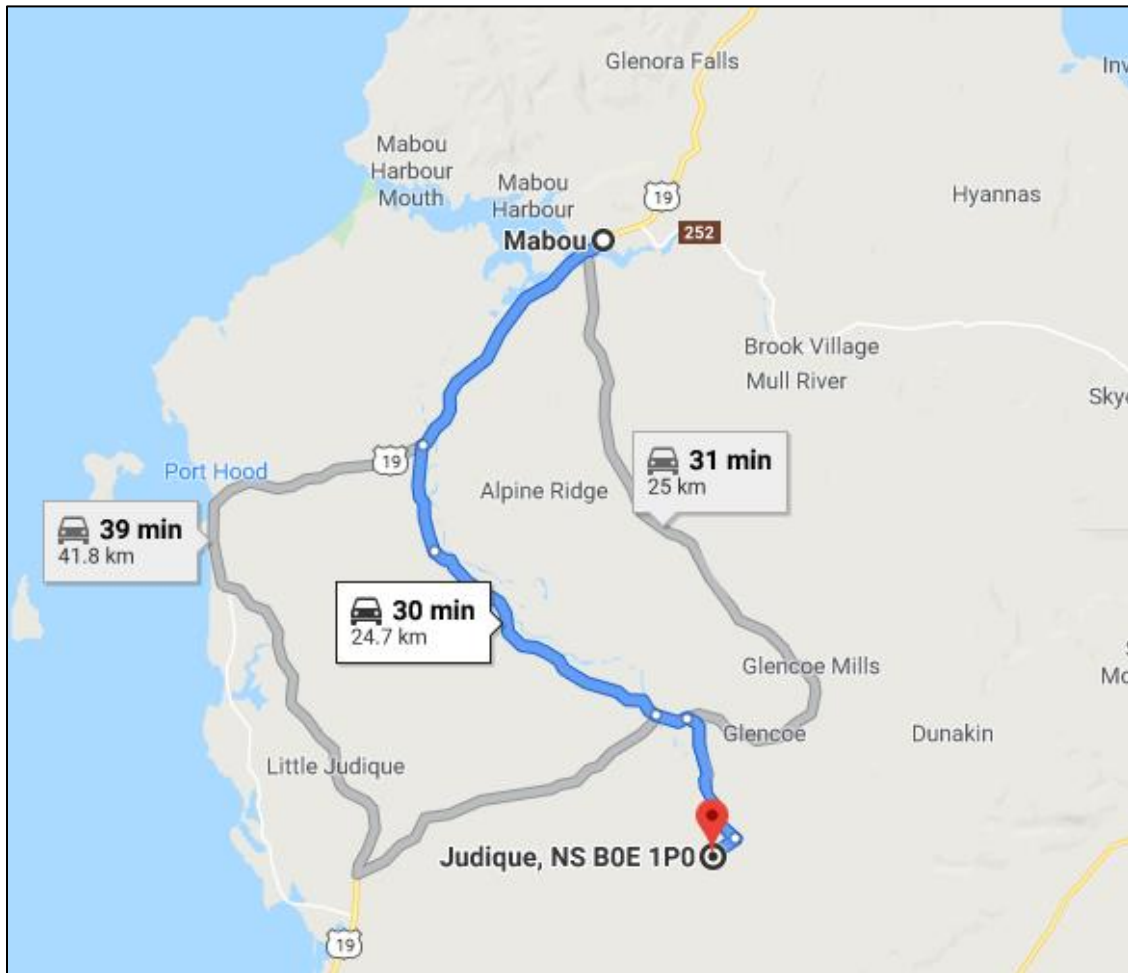


### Directions to Site

The map below was retrieved from Google Maps, which displays a visual of the directions to the site location in MacLeod's Settlement.

Google Map Directions: (30 min, 24.7 km drive)

- Head southwest on Ceilidh Trail/Nova Scotia Trunk 19 S toward Mabou Harbour Road (7.8 km)
- Turn left onto Mabou Road (3.0 km)
- Mabou Rd. turns slightly left and becomes Upper Southwest Mabou Road (8.1 km)
- Continue straight onto Glencoe Road (950 m)
- Turn right onto MacLeod Settlement Road (4.0 km)
- Turn right, destinations will be on the right



## PROJECT DESCRIPTION

Describing this year's project, including habitat issues this project is addressing, and restoration techniques used.

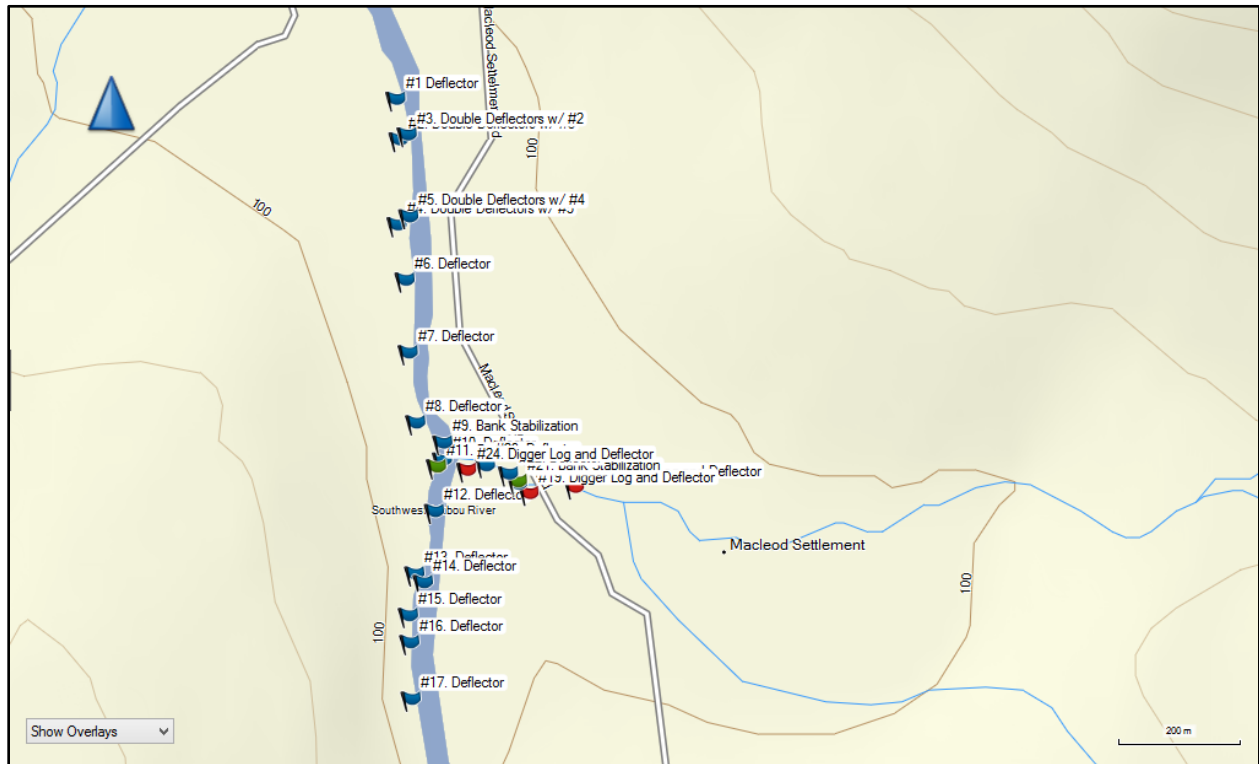
This year's project was focused in MacLeod's Settlement on the Southwest Mabou River and an Unnamed Tributary. Both watercourses are part of the Mabou Harbour Watershed and received in-stream habitat restoration. The restoration techniques used for this project involved installing new structures to fit the unique characteristics of each watercourse. Those structures included several deflectors, digger logs with deflectors, and bank stabilization by hand rocking eroded areas.

The Southwest Mabou River is an over-widened river with a design width of 14 meters. Some sections of river are measured to be 25 meters in width. The width is the main habitat concern as it created other habitat issues such as shallow depths, warmer water temperatures, lack of pooling areas and meandering patterns, lack of tree coverage, and bank erosion. Due to the width, ISAA was limited to the type of structures that could be installed. A total of 17 structures were installed in this watercourse, consisting of deflectors, and bank stabilization. As this watercourse has a design width of 14 meters, the spacing between structures was 75 meters. The logs for each structure were cut from the adjacent parcels of land with landowner permission. The logs for each structure were braced in using rebar and spikes and filled in with rock from the substrate of the watercourse. Each deflector was placed alternating sides of the river to help direct flow and will eventually create a defined meandering pattern with pooling areas. A few areas had received bank stabilization where ISAA had strategically placed rock from the substrate in the eroded areas. A total of 1200 meters and an area of 16,800 squared meters of stream habitat was restored.

The other watercourse ISAA restored was an unnamed tributary to the Southwest Mabou River. This watercourse has a design width of seven meters and suffers from little to no riparian zone, bank erosion and large sediment deposits. On this watercourse a total of seven structures were built and consisted of deflectors, digger logs with deflectors and bank stabilization. Each structure was placed 42 meters apart, restoring a length of 294 meters and an area of 2,058 squared meters of stream habitat. The logs used for these structures were harvested from the adjacent parcel of land, with landowner permission. The logs were braced in with rebar and spikes to ensure they stay in place and were then filled in with rock from the substrate. The deflectors were placed on alternating sides of the stream and were sized to compliment the stream characteristics. They direct waterflow along with creating deep pools for fish habitat. The digger logs were placed on a 30-degree angle with a 20-25 cm slope. Above the digger log is a ramp to direct the waterflow overtop of the log. It is a great fish spawning habitat! The upper end of the digger log is where the flow is concentrated, which creates a deep pool below the structure. It also directs the waterflow to the opposite

side of the watercourse, which creates that defined meandering pattern. The digger logs installed in this stream had deflectors built within them. The deflectors were placed on the lower end of the log, tapering back into the bank. They help direct the waterflow to the upper end of the log to help dig out pooling areas for fish. The bank stabilization structures were completed by hand, using rock from the substrate which was then strategically placed on the eroded areas. All structures contribute towards restoring the watercourse as they will work together to create spawning habitat, deep pools, a meandering pattern, controlled sediment deposits, and stabilized banks.

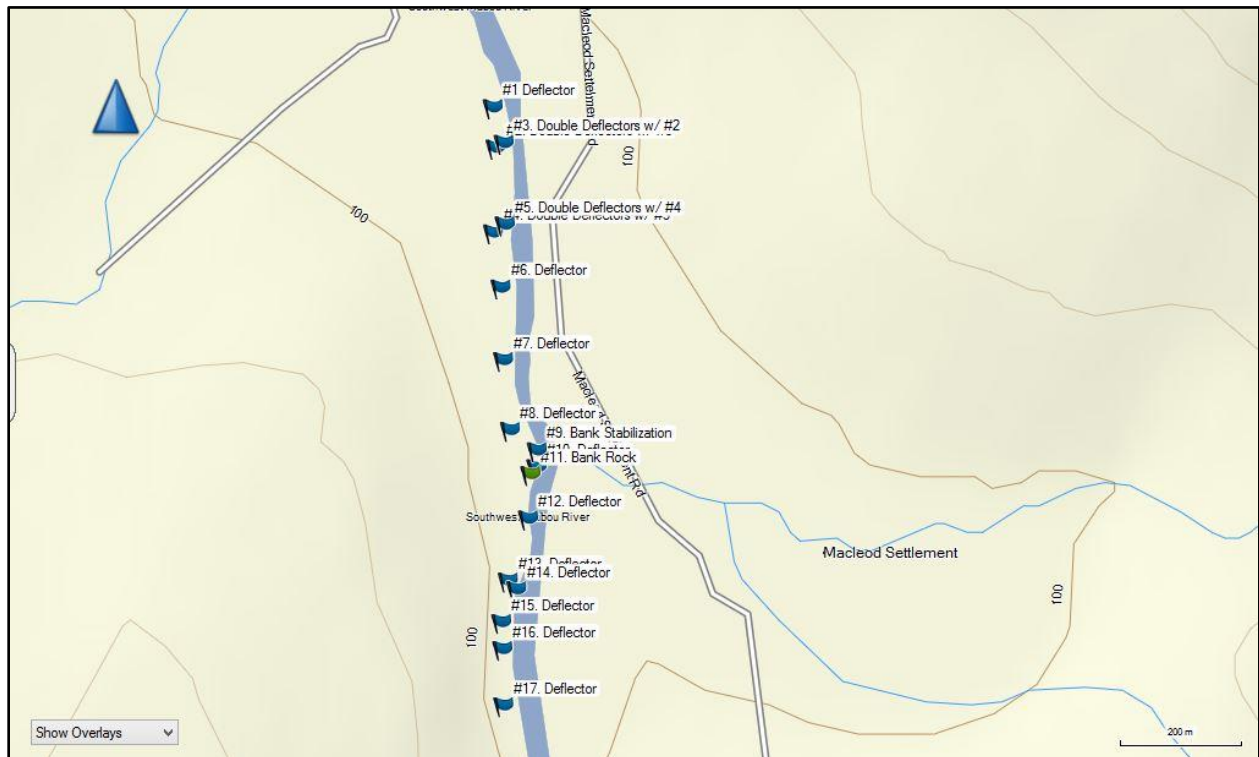
The map below displays all the structures that were installed during the 2020 season of stream habitat restoration. Each flag represents a structure and is color coded. The blue flags represent deflectors, the red flags represent digger logs with deflectors, and the green flag represents bank stabilization. Between the Southwest Mabou River and Unnamed Tributary, a total of 24 structures were installed. The total length of stream habitat restored is 1,494 meters; and the total area of stream habitat restored is 18,858 square meters.





## SOUTHWEST MABOU RIVER

The map below was retrieved from Garmin Basecamp, and displays all the GPS coordinates of each structure location on the Southwest Mabou River. A total of 17 structures were installed in this watercourse, the majority being deflectors. Due to the design width being 14 meters, larger deflectors were built to narrow out the channel width more effectively. The deflectors range in size, some being 2x1 meters, ranging upward to 7x3 meters. Each flag represents a structure and is color coded. The blue flags represent deflectors, and the green flag represents bank stabilization.



LOCATION INFORMATION	
<b>Watercourse</b>	Southwest Mabou River
<b>Watershed</b>	Mabou Harbour Watershed
<b>Location</b>	MacLeod's Settlement
<b>Nearest Community</b>	Judique/Mabou
<b>Road Crossing (Access Point)</b>	Unnamed Road off MacLeod's Settlement Road

<b>Map # (NS Topo Series 1:50,000)</b>	Lake Ainslie 11K/3
<b>Coordinates: Decimal Degrees</b>	
<b>Downstream Project Limit: Latitude</b>	45.93992°
<b>Downstream Project Limit: Longitude</b>	-61.35729°
<b>Upstream Project Limit: Latitude</b>	45.93114°
<b>Upstream Project Limit: Longitude</b>	-61.35695°
<b>PROJECT RESULTS</b>	
<b>INSTREAM HABITAT STRUCTURES</b>	
<b>Design Width</b>	14 meters
<b>Distance Between Structures (average design)</b>	75 meters
<b>Number and Type of Structures</b>	Deflectors: 15 Bank Stabilization: 2 Total: 17 Structures
<b>Total Length (meters) of Habitat Restored</b>	1200 meters
<b>Total Area (Sq. Meters) of Habitat Restored</b>	16,800 square meters

## STRUCTURE PHOTOS AND COORDINATES

**Structure #1.** Deflector – 6x3 meters, 3 tiers filled in with rock

**Coordinates:** (Degree Decimals)

Longitude: 45.93992°

Latitude: -61.35729°

**Photos:**



**Structure #2.** Double Deflector w/ #3 – 6x3 meters, 3 tiers filled in with rock

**Coordinates:** (Degree Decimals)

Longitude: 45.93933°

Latitude: -61.35722°

**Photos:**



**Structure #3.** Double Deflector w/ #4 - 6x3 meters, 3 tiers filled in with rock

**Coordinates:** (Degree Decimals)

Longitude: 45.93940°

Latitude: -61.35704°

**Photos:**



**Structure #4.** Double Deflector w/ #5 - 6x3 meters, 3 tiers filled in with rock

**Coordinates:** (Degree Decimals)

Longitude: 45.93808°

Latitude: -61.35726°

**Photos:**



**Structure #5.** Double Deflector w/ #4 - 6x3 meters, 3 tiers filled in with rock

**Coordinates:** (Degree Decimals)

Longitude: 45.93820°

Latitude: -61.35701°

**Photos:**



**Structure #6.** Deflector - 6x3 meters, 3 tiers filled in with rock

**Coordinates:** (Degree Decimals)

Longitude: 45.93727°

Latitude: -61.35709°

**Photos:**



**Structure #7.** 6x3 meters, 2 tiers filled in with rock. Its placed-on bedrock, so the structure is braced to the bank.

**Coordinates:** (Degree Decimals)

Longitude: 45.93621°

Latitude: -61.35702°

**Photos:**



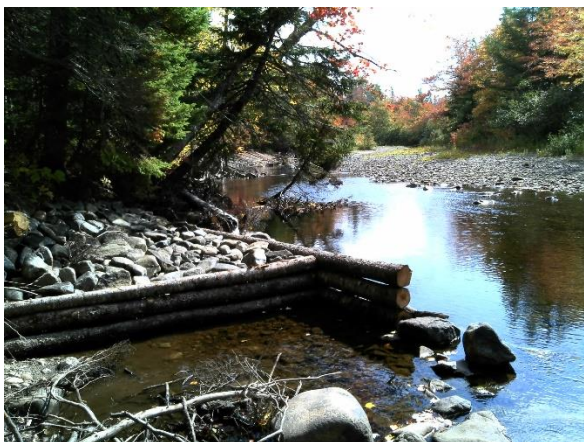
**Structure #8.** Deflector - 6x3 meters, 3 tiers filled in with rock. Tucked behind a tree.

**Coordinates:** (Degree Decimals)

Longitude: 45.93519°

Latitude: -61.35685°

**Photos:**



**Structure #9.** Bank Stabilization – approximately 40 ft long. It has timber bracing the rock to help prevent erosion. The front is rock and filled in with debris and brush.

**Coordinates:** (Degree Decimals)

Longitude: 45.93489°

Latitude: -61.35626°

**Photos:**



**Structure #10.** Deflector - 6x3 meters, 3 tiers filled in with rock. This structure is near the confluence of a small cold-water tributary.

**Coordinates:** (Degree Decimals)

Longitude: 45.93464°

Latitude: -61.35626°

**Photos:**



**Structure #11.** Bank Stabilization – approximately 25 ft long, filled in with rock to the bank.

**Coordinates:** (Degree Decimals)

Longitude: 45.93454°

Latitude: -61.35639°

**Photos:**



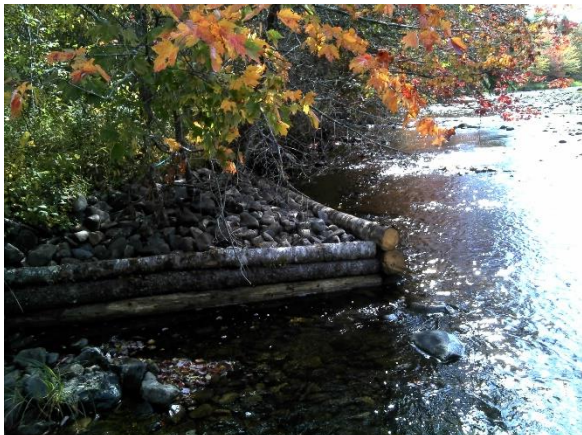
**Structure #12.** Deflector - 6x3 meters, 3 tiers filled in with rock

**Coordinates:** (Degree Decimals)

Longitude: 45.93389°

Latitude: -61.35644°

**Photos:**





**Structure #13.** Deflector - 6x3 meters, 3 tiers filled in with rock. Big logs were used.

**Coordinates:** (Degree Decimals)

Longitude: 45.93297°

Latitude: -61.35687°

**Photos:**



**Structure #14.** Deflector – 2x1 meters, 2 tiers filled in with rock. It is protecting the confluence of a cold-water tributary.

**Coordinates:** (Degree Decimals)

Longitude: 45.93285°

Latitude: -61.35668°

**Photos:**



**Structure #15.** Deflector - 6x3 meters, 3 tiers filled in with rock

**Coordinates:** (Degree Decimals)

Longitude: 45.93237°

Latitude: -61.35701°

**Photos:**



**Structure #16.** Deflector - 6x3 meters, 3 tiers filled in with rock. Brush was placed below.

**Coordinates:** (Degree Decimals)

Longitude: 45.93197°

Latitude: -61.35698°

**Photos:**



**Structure #17.** Deflector – 7x3 meters, 2 tiers filled in with rock

**Coordinates:** (Degree Decimals)

Longitude: 45.93114°

Latitude: -61.35695°

**Photos:**

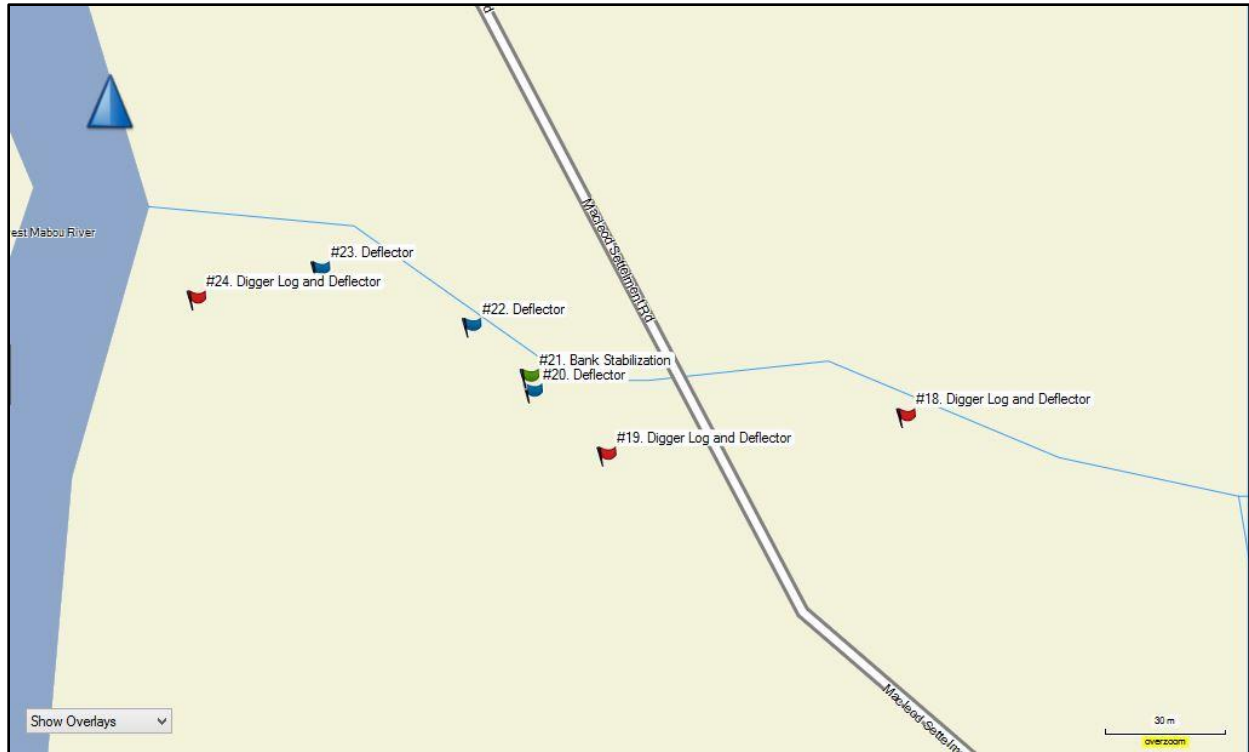


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### UNNAMED TRIBUTARY TO THE SOUTHWEST MABOU RIVER

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The map below was retrieved from Garmin Basecamp, and displays all the GPS coordinates of each structure location on the Unnamed Tributary to the Southwest Mabou River. A total of 7 structures were installed in this watercourse such as: deflectors, digger logs with deflectors and bank stabilization. The digger logs placed within this watercourse fit the design width of 7 meters and have deflectors attached. The deflectors installed range from 4x1 meters to 4x2 meters in size. Each flag represents a structure and is color coded. The blue flags represent deflectors, the red flags represent digger logs with deflectors, and the green flag represents bank stabilization.



LOCATION INFORMATION	
<b>Watercourse</b>	Unnamed Tributary to the Southwest Mabou River
<b>Watershed</b>	Mabou Harbour Watershed
<b>Location</b>	MacLeod's Settlement
<b>Nearest Community</b>	Judique/Mabou
<b>Road Crossing (Access Point)</b>	Unnamed Road off MacLeod's Settlement Road
<b>Map # (NS Topo Series 1:50,000)</b>	Lake Ainslie 11K/3
<b>Coordinates: Decimal Degrees</b>	
<b>Downstream Project Limit: Latitude</b>	45.93449°
<b>Downstream Project Limit: Longitude</b>	-61.35573°
<b>Upstream Project Limit: Latitude</b>	45.93424°
<b>Upstream Project Limit: Longitude</b>	-61.35335°

PROJECT RESULTS: INSTREAM HABITAT STRUCTURES	
<b>Design Width</b>	7 meters
<b>Distance Between Structures (average design)</b>	42 meters
<b>Number and Type of Structures</b>	Deflectors: 3 Digger Logs with Deflectors: 3 Bank Stabilization: 1 Total: 7 Structures
<b>Total Length (meters) of Habitat Restored</b>	294 meters
<b>Total Area (Sq. Meters) of Habitat Restored</b>	2,058 square meters

STRUCTURE PHOTOS AND COORDINATES

**Structure #18.** Digger Log with Deflectors – deflector is 4x1 meters, two tiers filled with rock and is attached to a digger log measured to the channel width.

**Coordinates:** (Degree Decimals)

Longitude: 45.93424°

Latitude: -61.35335°

**Photos:**



**Structure #19.** Digger Log with Deflector – deflector is 4x1 meters, 2 tiers filled with rock and is attached to a digger log measured to the channel width.

**Coordinates:** (Degree Decimals)

Longitude: 45.93415°

Latitude: -61.35435°

**Photos:**



**Structure #20.** Deflector – 4x2 meters, 2 tiers filled with rock. Big logs used.

**Coordinates:** (Degree Decimals)

Longitude: 45.93429°

Latitude: -61.35460°

**Photos:**



**Structure #21.** Bank Stabilization – log with rock used to protect the bank

**Coordinates:** (Degree Decimals)

Longitude: 45.93432°

Latitude: -61.35461°

**Photos:**



**Structure #22.** Deflector – 4x2 meters, 2 tiers filled with rock

**Coordinates:** (Degree Decimals)

Longitude: 45.93444°

Latitude: -61.35481°

**Photos:**



**Structure #23.** Deflector – 4x2 meters, 2 tiers filled with rock

**Coordinates:** (Degree Decimals)

Longitude: 45.93456°

Latitude: -61.35531°

**Photos:**



**Structure #24.** Digger Log with Deflector – deflector is 4x2 meters, 2 tiers filled with rock and is attached to a digger log measured to the channel width.

**Coordinates:** (Degree Decimals)

Longitude: 45.93449°

Latitude: -61.35573°

**Photos:**

