



Stream Habitat Restoration

Upper Southwest Mabou River Installation Project

2021

Submitted by: Kailey Mortensen

Submitted to: Dave Cameron & Geoff Nishi

Date: December 2021

TABLE OF CONTENTS

| | |
|--------------------------------------------|----|
| Project Breif | 3 |
| Contact Information..... | 3 |
| Volunteers..... | 3 |
| Paid Personnel | 3 |
| Project Title..... | 4 |
| Site Location(S) | 4 |
| Context Map | 4 |
| Directions to Site..... | 6 |
| Project Description | 7 |
| Upper Southwest Mabou River | 8 |
| Location Information | 8 |
| Project Results | 9 |
| Installation Pictures and Coordinates..... | 10 |
| Riparian Zone Restoration | 15 |
| Unnamed Tributary..... | 15 |
| Location Information | 15 |
| Project Results | 15 |
| Mull River | 16 |
| Location Information | 16 |
| Project Results | 17 |
| Pictures of Trees | 19 |
| Sponsor Recognition | 20 |

PROJECT BREIF

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

| VOLUNTEERS | |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Volunteer Contribution to ISAA | Volunteer Components: <ul style="list-style-type: none"> • Two volunteers for project management, administration, and accounting – 180 hours at \$30/hr • 15 volunteers for fish stocking, debris removal, watershed supervision, and cleanup – 620 hours at \$15/hr |
| Number of People Volunteering on All Aspects of the Project | 17 |
| Total Volunteer Hours | 800 hours |

| PAID PERSONNEL | |
|----------------------------------|---------------------------------------------------------------------------------------------|
| Number of Project Workers | Crew Members: <u>4 paid personnel</u> Nathan MacLean Michael Campbell Sandy Rankin |

INVERNESS SOUTH ANGLERS ASSOCIATION

| | |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| | Steven Beaton <u>Field Technician: 1 paid personnel</u> Kailey Mortensen <u>Student Interns: 1 paid personnel</u> Jayden Muise |
| Total Weeks of Work | 19 weeks total |
| Start Date: | May 24 th , 2021 |
| End Date: | October 1 st , 2021 |
| Other Paid Staff Contributing to the Project | Charles MacInnis, Planning and Technical Consultant |

| PROJECT TITLE |
|----------------------------------------------------------------|
| Upper Southwest Mabou River Stream Habitat Restoration Project |

| SITE LOCATION(S) | |
|---------------------------|--------------------------------------------|
| Watercourse(s): | Upper Southwest Mabou River |
| Watershed(s): | Mabou Harbour Watershed |
| Location(s): | MacLeod's Settlement |
| Nearest Community: | Judique or Mabou |
| Road Crossing(s): | Unnamed Road off MacLeod's Settlement Road |

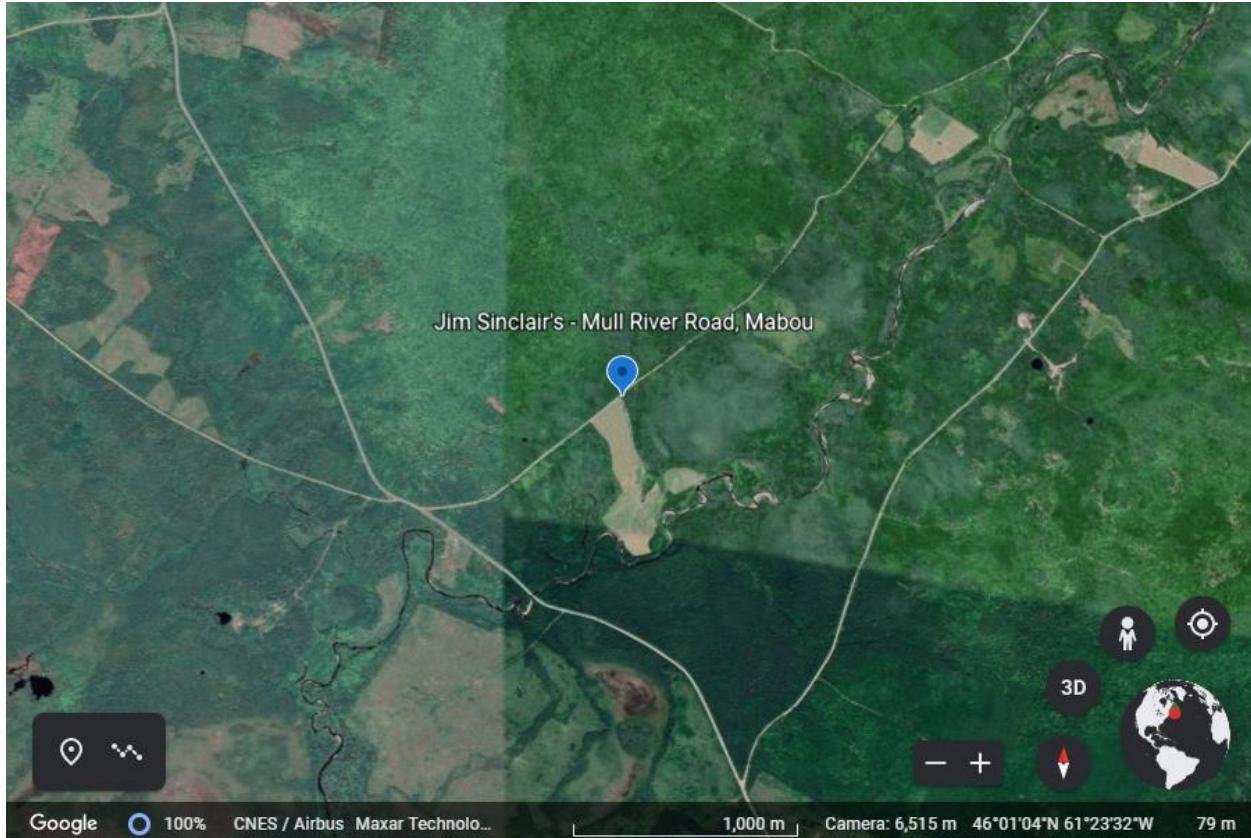
Context Map

The context map seen below is a Google Earth image of the site location in MacLeod's Settlement within the Mabou Harbour Watershed Boundary. This is where the stream habitat restoration project on the Upper Section of the Southwest Mabou River took place along with the riparian zone restoration project on the Unnamed Tributary as well.

INVERNESS SOUTH ANGLERS ASSOCIATION



The photo seen below is the second site that had received riparian zone restoration work. This parcel of land is Jim Sinclair's and is located on the Mull River Road.



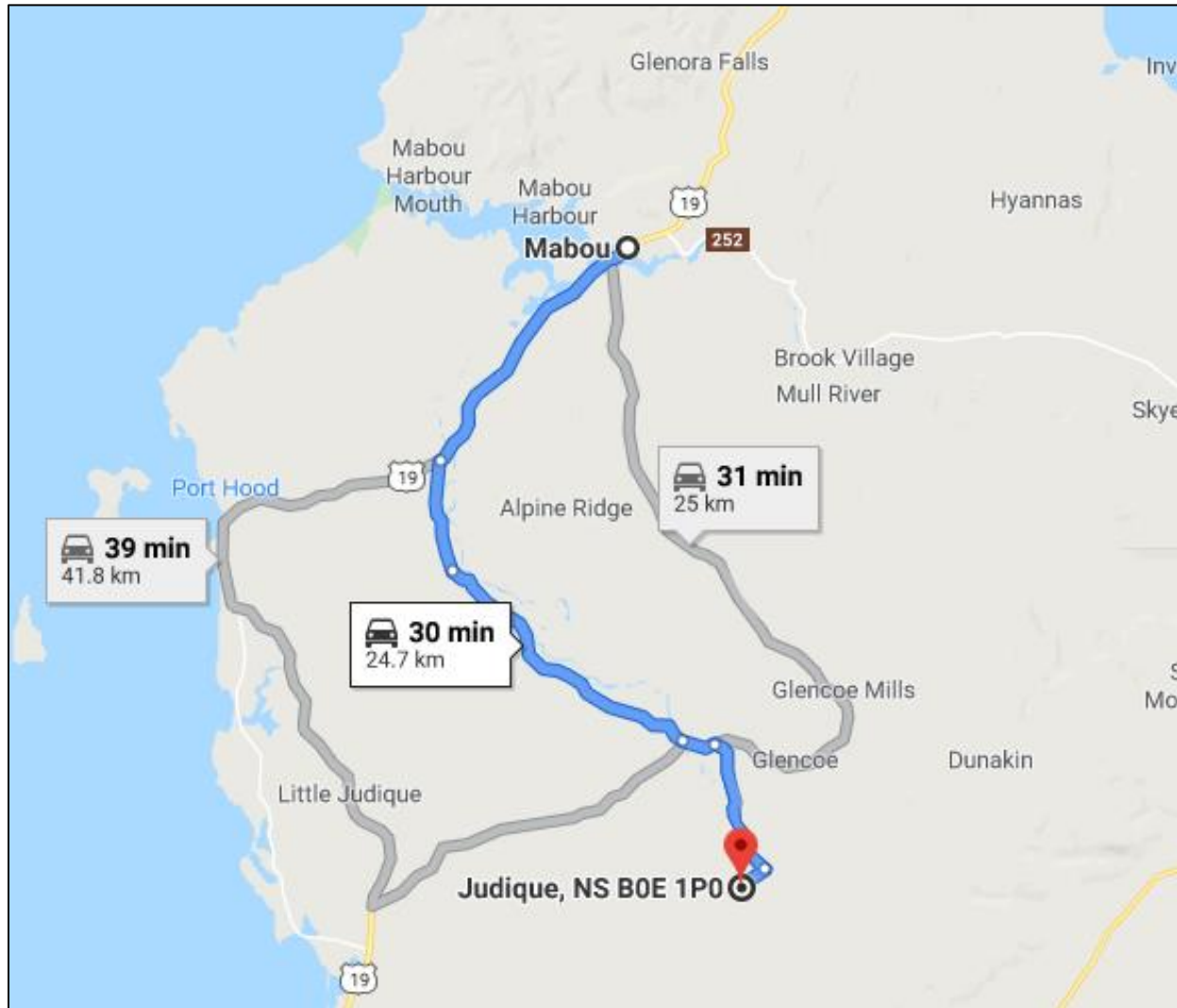
INVERNESS SOUTH ANGLERS ASSOCIATION

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.

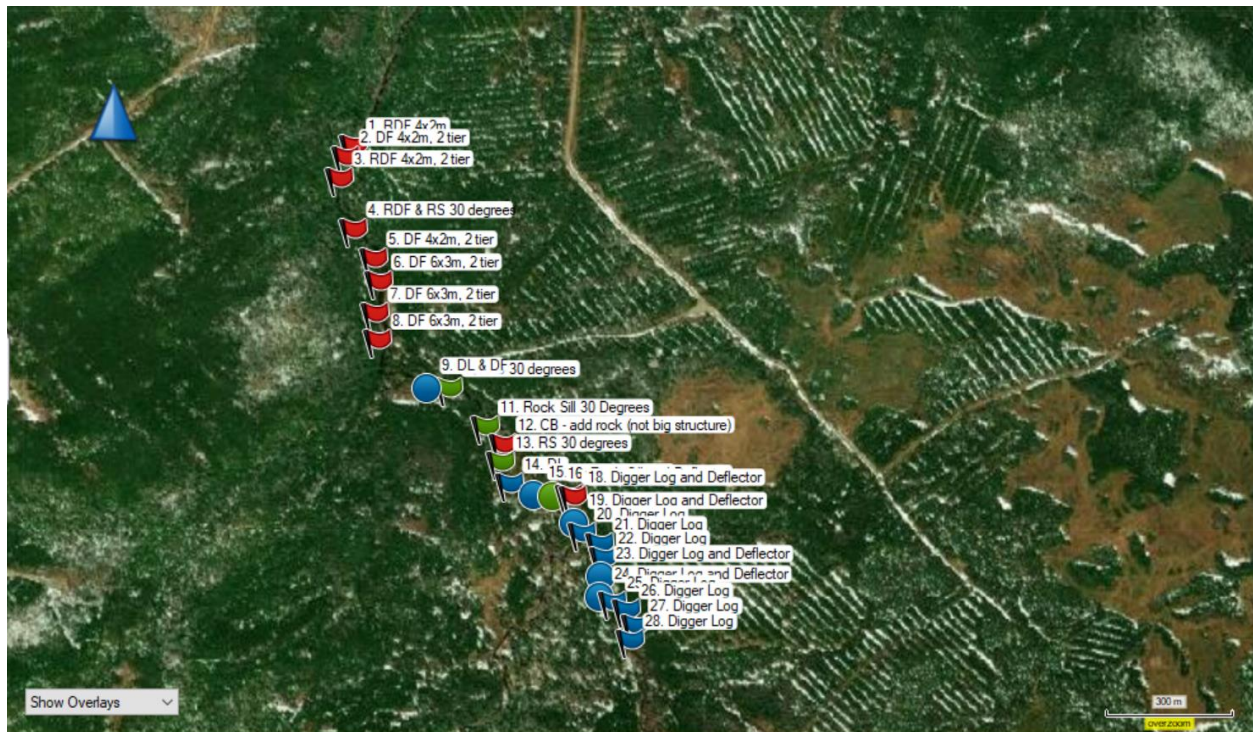
This year's project was focused in MacLeod's Settlement on the Upper Southwest Mabou River. The Upper Southwest Mabou River is part of the Mabou Harbour Watershed and received in-stream habitat restoration during the 2021 season. The restoration techniques used for this project involved installing new structures to fit the unique characteristics of the watercourse. Those structures include deflectors, digger logs, digger log with deflectors, rock sills, rock sills with deflectors, bank stabilization by hand rocking eroded areas, and channel blocker.

The Upper Southwest Mabou River is an over-widened river with a design width of 10 meters. The lower sections of river are measured up to 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. As the upper section is narrower than the lower section, ISAA had could install several types of structures. A total of 28 structures were installed in this watercourse, consisting of different variations of deflectors, digger logs, rock sill, channel blockers and bank stabilization. As this watercourse has a design width of 10 meters, the spacing between structures was 60 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. The area of river that had received bank stabilization, ISAA had done by hand and strategically placed rock from the substrate in the eroded areas. A total of 1,680 meters and an area of 16,800 squared meters of stream habitat was restored.

ISAA had also completed riparian zone restoration in two different locations during the 2021 season of habitat restoration. The first location was located on an Unnamed Tributary in MacLeod's Settlement, and the second location was at Jim Sinclair's property on the Mull River. Between the two locations, ISAA had planted approximately 550 trees. The species of trees planted included sugar maple, white pine, and white oak. All trees were planted 6 feet apart and were placed in areas with an open canopy. Between the two locations, the total area of riparian zone restored is 7,050 square meters.

UPPER SOUTHWEST MABOU RIVER

The map below displays all the structures that were installed during the 2021 season of stream habitat restoration. Each colored flag and circle represent a structure type. The red flags represent deflectors, and the one bank rock structure and channel blocker. The blue flags represent digger logs, and the blue circles are digger logs with deflectors. The green flags represent rock sills, and the green circles are rock sills with deflectors. This map was created on Basecamp using the GPS coordinates that were taken at each structure. From structure one to structure 28, there is a span of 1,680 meters of stream habitat that was restored.



| LOCATION INFORMATION | |
|--------------------------|-----------------------------|
| Watercourse | Upper Southwest Mabou River |
| Watershed | Mabou Harbour Watershed |
| Location | MacLeod's Settlement |
| Nearest Community | Judique/Mabou |

INVERNESS SOUTH ANGLERS ASSOCIATION

| | |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Road Crossing (Access Point) | Unnamed Road off MacLeod's Settlement Road |
| Map # (NS Topo Series 1:50,000) | Lake Ainslie 11K/3 |
| Coordinates: Decimal Degrees | |
| Downstream Project Limit: Latitude | N45.90902° |
| Downstream Project Limit: Longitude | W61.36100° |
| Upstream Project Limit: Latitude | N45.89856° |
| Upstream Project Limit: Longitude | W61.35375° |
| PROJECT RESULTS | |
| INSTREAM HABITAT STRUCTURES | |
| Design Width | 10 meters |
| Distance Between Structures (average design) | 60 meters |
| Number of Structures | 28 |
| Type of Structures | Deflectors, digger logs, digger logs with deflectors, rock sills, rock sills with deflectors, bank stabilization done by hand rocking and a channel blocker. |
| Total Length (meters) of Habitat Restored | 1,680 meters |
| Total Area (Sq. Meters) of Habitat Restored | 16,800 square meters |

INSTALLATION PICTURES AND COORDINATES

1. Rock Deflector 4x2 meters,
N45.90899° W61.36102°



2. Rock Deflector 4x2 meters,
N45.90876° W61.36116°



3. Deflector, 6x3 meters, 2 tiers,
N45.90830° W61.36135°



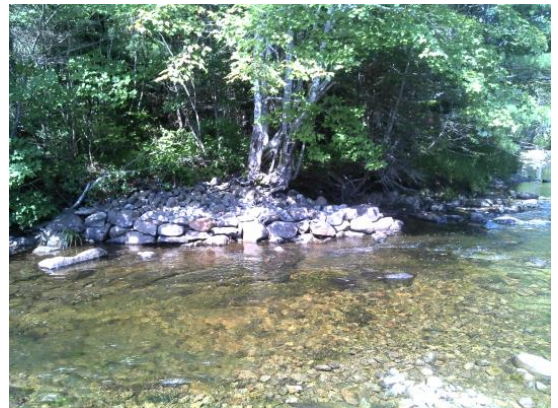
4. Rock Deflector 6x3 meters, and Rock
Sill, 30 degrees, N45.90733°
W61.36098°



5. Deflector, 4x2 meters, 2 tiers,
N45.90666° W61.36030°



6. Rock Deflector, 6x3 meters, 2 tiers,
N45.90611° W61.36024°



INVERNESS SOUTH ANGLERS ASSOCIATION

7. Deflector, 6x3 meters, 2 tiers,
N45.90550° W61.36033°



8. Deflector, 6x3 meters, 2 tiers,
N45.90496° W61.36014°



9. Digger Log and Rock Deflector, 6x3
meters, N45.90399° W61.35907°



10. Rock Sill, 30 degrees, N45.90384°
W61.35849°



11. Rock Sill, 30 Degrees, N45.90308°
W61.35741°



12. Channel Blocker, logs, and rock,
N45.90276° W61.35708°



INVERNESS SOUTH ANGLERS ASSOCIATION

13. Rock Sill, 30 Degrees, N45.90232°
W61.35722°



16. Rock Sill and Rock Deflector, N45.90171° W61.35584°



14. Digger Log and Deflector, 4x2 meters, N45.90183° W61.35691°



17. Bank Stabilization, N45.90164° W61.35535°



15. Digger Log and Deflector, 6x3 meters, N45.90173° W61.35632°



18. Digger Log and Deflector, 6x3 meters, N45.90160° W61.35526°



INVERNESS SOUTH ANGLERS ASSOCIATION

19. Digger Log, N45.90118° W61.35518°



20. Digger Log, N45.90089° W61.35505°



21. Digger Log, N45.90066° W61.35462°



22. Digger Log and Deflector, 6x3 meters, 2 tiers, N45.90035° W61.35438°



23. Digger Log, N45.90000° W61.35450°



24. Digger Log and Deflector, 4x2 meters, 2 tiers, N45.89957° W61.35450°



INVERNESS SOUTH ANGLERS ASSOCIATION

25. Digger Log, N45.89938° W61.35423°



28. Digger Log, N45.89857° W61.35381°



26. Digger Log, N45.89925° W61.35386°



27. Digger Log, N45.89885° W61.35369°



RIPARIAN ZONE RESTORATION

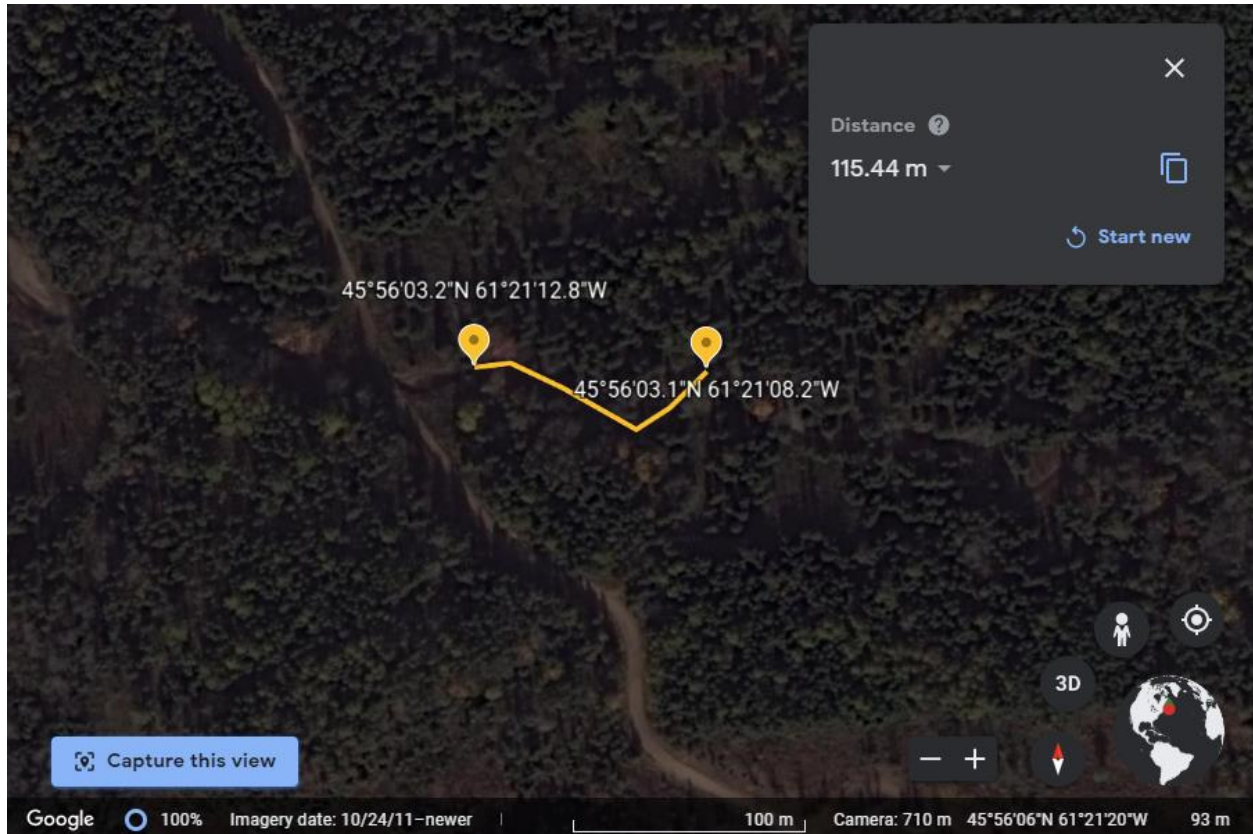
ISAA had chosen two locations for riparian zone restoration during the 2021 season. The first location was at an Unnamed Tributary located in MacLeod's Settlement, and the second location was at Jim Sinclair's along the Mull River. These locations were chosen as they both had little to no buffer zone which is extremely important for stream bank stabilization, sediment control, reducing flood water velocity, and for wildlife protection and tree cover for fish. Between the two locations, ISAA had planted approximately 550 trees which consisted of sugar maple, white oak, and white pine. All trees were planted 6 feet apart and were placed in areas with an open canopy.

UNNAMED TRIBUTARY

| LOCATION INFORMATION | |
|--------------------------------------------|--------------------------------------------|
| Watercourse | Unnamed Tributary to the SW Mabou River |
| Watershed | Mabou Harbour Watershed |
| Location | MacLeod's Settlement |
| Nearest Community | Judique/Mabou |
| Road Crossing (Access Point) | Unnamed Road off MacLeod's Settlement Road |
| Map # (NS Topo Series 1:50,000) | Lake Ainslie 11K/3 |
| Coordinates: Decimal Degrees | |
| Downstream Project Limit: Latitude | N45.93421° |
| Downstream Project Limit: Longitude | W61.35356° |
| Upstream Project Limit: Latitude | N45.93420° |
| Upstream Project Limit: Longitude | W61.35228° coordinate |
| PROJECT RESULTS | |
| Number of Trees Planted | 400 |
| Species of Trees Planted | Sugar Maple, white oak, white pine |
| Length of Riparian Zone Restored | 115 meters |

| | |
|---------------------------------------------|---------------------|
| Width of Riparian Zone Restored | 30 meters |
| Total Area of Riparian Zone Restored | 3,450 square meters |

The map seen below shows the first tree planting site located at the Unnamed Tributary in MacLeod’s Settlement. This map was taken from google maps, and shows the downstream project limit, and the upstream project limit where ISAA had planted a riparian zone.

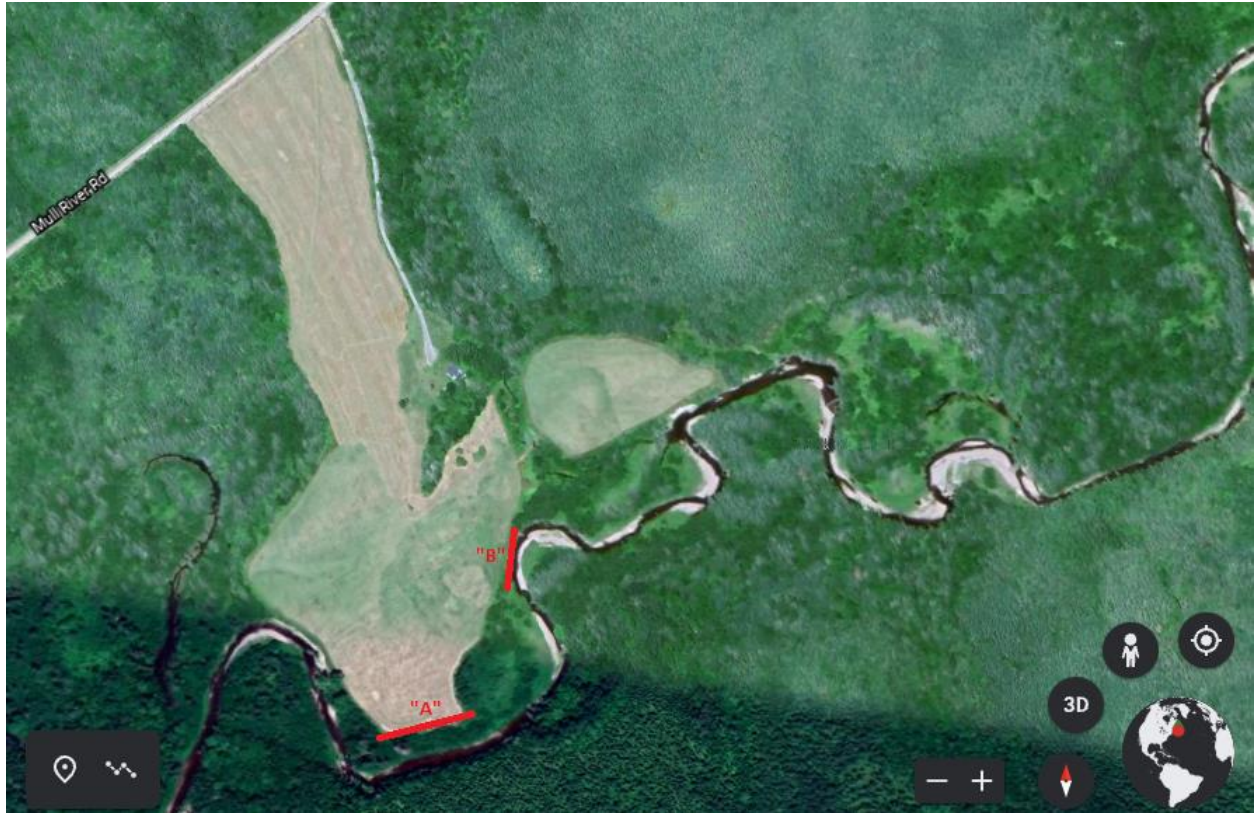


MULL RIVER

| LOCATION INFORMATION | |
|--------------------------|-------------------------|
| Watercourse | Mull River |
| Watershed | Mabou Harbour Watershed |
| Location | Jim Sinclair’s Property |
| Nearest Community | Mabou |

| | |
|---------------------------------------------|----------------------------------------------------------------------------------------------|
| Road Crossing (Access Point) | Mull River Road |
| Map # (NS Topo Series 1:50,000) | Lake Ainslie 11K/3 |
| Coordinates: Decimal Degrees | |
| Downstream Project Limit: Latitude | N46.00277° |
| Downstream Project Limit: Longitude | W61.36305° |
| Upstream Project Limit: Latitude | N46.00083° |
| Upstream Project Limit: Longitude | W61.36305° |
| PROJECT RESULTS | |
| Number of Trees Planted | 150 - 100 planted along section "A" - 50 planted along section "B" |
| Species of Trees Planted | Sugar Maple, white oak, white pine |
| Length of Riparian Zone Restored | 120 meters - Section "A" approximately 80 meters - Section "B" approximately 40 meters |
| Width of Riparian Zone Restored | 30 meters |
| Total Area of Riparian Zone Restored | 3,600 square meters |

The map seen below shows the second tree planting site located at the Mull River on Jim Sinclair's property. This map was taken from google maps and shows the two sections of river that were planted – section "A" and section "B".



Pictures of Trees

The photos seen below show the variations of tree species ISAA had for riparian zone restoration for both project locations.



SPONSOR RECOGNITION

Signage for the Southwest Mabou River was posted to provide sponsor recognition to all project partners who kindly support ISAA with project funds. Without our project partners, ISAA simply would not be able to achieve their goals and complete stream habitat restoration projects each season. ISAA would like to give thanks and recognition to the project partners who participated in 2021. Those project partners include Atlantic Salmon Conservation Foundation, Wild Salmon Unlimited, Inverness South Anglers Association, DFO – Habitat Stewardship Program, Landowners, Mabou River Inn, Nova Scotia Salmon Association, Canada Summer Jobs, and Nova Scotia Fisheries and Aquaculture.

Signage Location: N45.91729° W61.35308°

