

Habitat Assessments of Scott Brook



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Lauren Clark, Project Coordinator

Kal Dutta, Summer Student Intern

EOS Eco-Energy Inc.

P.O. Box 6001, 43D Main Street

Sackville, NB E4L 1G6

www.eosecoenergy.com



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Executive Summary

In summer 2022, EOS completed habitat assessments of Scott Brook to help establish baseline conditions of the stream and identify areas of concern for future, potential restoration projects. These assessments consisted of collecting information on physical characteristics, riparian conditions, and basic water quality parameters in 100-meter increments throughout the stream.

EOS assessed a total of 3.2 kilometers of Scott Brook. Therefore, a total of 32, 100-meter reaches were assessed. Restrictions for these assessments included limited road access and challenging field conditions. A points system was used to rank each 100-meter assessment. Six factors were used in the points system to define a potential restoration site and the number of points were used to classify 100-meter assessments as healthy, healthy with problems or unhealthy. In summary, 47% (15 reaches) of assessments of Scott Brook were deemed healthy, 38% (12 reaches) were healthy with problems, and 13% (4 reaches) were unhealthy. One reach was not able to be analyzed because it was not accessible. Common themes across sites in Scott Brook were grassy banks, and low shade cover. There were also sites experiencing some form of erosion, high water temperatures and low dissolved oxygen values.

Recommendations for Scott Brook consist of tree planting in riparian zones for sites with stream banks that are bare of vegetation or have large amounts of grassy vegetation. Additionally, clearing the blocked culvert and the construction of brush mats along silty stream bends could assist with removing fine sediment at sites where there is abundant sand and silt. These recommendations are to help direct EOS as we continue our efforts in the Cape Tormentine Watershed. The recommendations are not all inclusive but rather an overview of the restoration activities that could be undertaken.

Stream habitat assessment data gathered from this project will provide a record of the current state of stream and riparian health of Scott Brook. Using this data, EOS and other organizations can plan restoration projects for problem areas and work to prevent potential future problems by maintaining the healthy reaches of streams. In the future, EOS would like to;

- 1) Extend assessments of Scott Brook to areas that were not reached, perform habitat assessments on other streams in the Cape Tormentine Watershed, the Tantramar River Watershed and the Rockport - Dorchester watershed.
- 2) Restore unhealthy sections of Scott Brook.

Introduction

In 2022, EOS Eco-Energy conducted habitat assessments along 3.2 km of Scott Brook with funding from the New Brunswick Wildlife Trust Fund. The goal of this work was to obtain baseline data for Scott Brook, find what types of habitats exist, how healthy they are, and identify any issues facing the riparian and aquatic habitats along the brook.

Healthy riparian zones provide a number of ecosystem services which protect and strengthen the environment, such as improved water quality, water storage and flood mitigation, erosion protection, and groundwater recharge. In addition, healthy riparian zones benefit wildlife, as species living in riparian zones and the water body are dependent on the area for habitat and food requirements. Healthy riparian zones lead to healthy aquatic ecosystems. They help improve water quality and reduce sedimentation into the river, which can be detrimental to aquatic ecosystems by suffocating fish and burying aquatic insects.

There are many unknowns in terms of watershed health in our region due to the previous lack of a watershed group, until the establishment of EOS's Chignecto Watersheds Committee in 2017.

EOS assessed Scott Brook, with no baseline data available. The brook contributes greatly to habitat diversity, the food chain, and water chemistry within the watershed. It flows into the Northumberland Strait at Murray Corner. The outflow point is situated east of the Murray Corner Provincial Park Campground and west of the Confederation Bridge. Land uses in the area include forestry activity, residential developments, and agriculture, all of which can have varying degrees of impact on our watershed habitats. Degradation of various habitat diminishes a watershed's capacity to provide critical ecosystem functions, which in turn impacts aquatic ecosystems.

The goal of this work was to obtain baseline data on Scott Brook and identify any problem areas along the brook, to guide future restoration activities. The information gathered from this project will provide valuable data including stream channel characteristics (wet width, depth), riparian characteristics (vegetative cover, shade cover, bank conditions), and aquatic habitat conditions (substrate composition, flow).

These assessments are among the first steps in establishing baseline conditions for this watershed, through identifying existing areas of concern, and will ultimately help with developing a watershed management plan. Using this data, we can work towards improving and maintaining healthy aquatic & riparian habitats.

Methodology

Stream habitat assessments were conducted using an EOS Habitat Assessment Field Sheet which was based on the “Habitat Assessment Field Sheet” developed by the Kennebecasis Watershed Restoration Committee (KWRC). A copy of the EOS Habitat Assessment Field Sheet can be found in Appendix 1. The assessments involved a number of measurements, including GPS coordinates, photos, reach length (100 m reaches were used), stream channel characteristics (wet width, depth), riparian characteristics (vegetative cover, shade cover, bank conditions), and aquatic habitat conditions (substrate composition, flow). Any other notes of interest were included (e.g., any wildlife seen, aquatic barriers, bridges, threats to water quality, garbage/dump sites, beaver activity, etc.). In-situ water quality measurements (temperature, pH, conductivity, dissolved oxygen, total dissolved solids, salinity) were also taken using a YSI Multi-parameter probe. Most of the data was based on observation and is therefore subject to interpretation.

Following data collection, EOS staff compiled site information into a condensed, readable format (Appendix 2). An interactive Google map was created, mapping the coordinates and habitat information for each assessment.

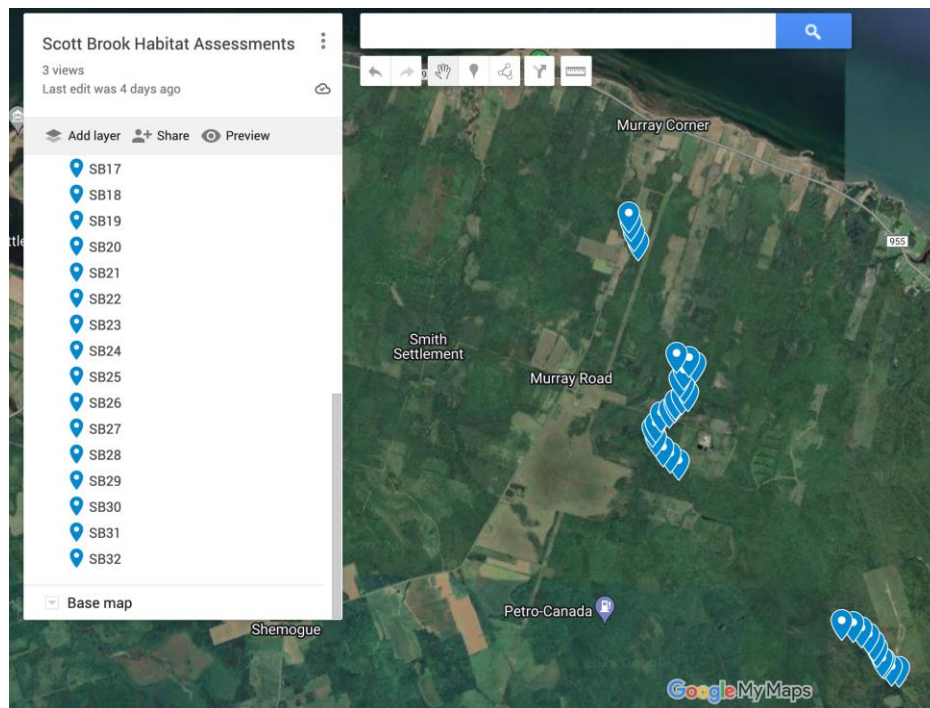


Figure 1: Screenshot of the Scott Brook Interactive Map

Mapped assessments also included photos of riparian and stream habitat, and a link to raw data sheets that were transcribed onto Google Docs (Figure 1).

Challenges

We were only able to complete 3.2 kilometers of the brook because of restricted access and challenging conditions.

It took longer to reach the brook than was previously estimated, both by car and on foot. We got stuck numerous times on back roads that were in poor condition and in one case had to be pulled out by a farmer with a tractor.

The first section of the brook that was assessed was especially slow going, because it was a very swampy area, with many downed trees, which made navigating the area tricky and very time consuming. This meant that it took us 4 days to do the first 10 reaches, when we had planned on completing approximately 5 reaches per day.

Results

In the summer of 2022, EOS conducted stream habitat assessments covering 3.2 km of Scott Brook. Assessments were performed every 100 meters; therefore, a total of 32 assessments were completed along Scott Brook. Restricted road access and challenging field conditions were limitations for this project.

Raw data is summarized into tables below that represent the 3 main components of a habitat assessment. Riparian Zone Conditions (Table 1), Channel Conditions (Table 2), Aquatic Habitat Conditions (Table 3). Assessment conditions were averaged for each section of the stream.

The stream was divided into three sections for the purposes of analysis. The three sections were upstream (1-10), midstream (11- 28) and downstream (29-32). The following tables represent a summary of average habitat conditions for each section of the brook that are important for identifying healthy watersheds (Table 1, 2, and 3).

Table 1: Averaged data for riparian zone conditions of Scott Brook

Stream Section	Riparian Zone Conditions		
	Left Bank Conditions	Right Bank Conditions	Vegetative Cover

Habitat Assessments of Scott Brook - February 2023

	Stable (%)	Slightly Eroding (%)	Heavily Eroding (%)	Stable (%)	Slightly Eroding (%)	Heavily Eroding (%)	Bare (%)	Grasses (%)	Shrubs (%)	Trees (%)	Shade Cover (%)
Upstream	70	29	1	70	31	2	0	57	34	9	56
Midstream	60	25	14	56	22	19	6	48	18	27	32
Downstream	65	29.5	5.5	68	20	11	4	54	11	28	41

Riparian zone conditions were on average, good. The majority of the banks surveyed were stable for the most part with a minimal amount of erosion. Average bank conditions saw more slight erosion than heavy erosion on both sides (Table 1). Average vegetation cover for grasses was relatively high, between 48% and 57% (Table 1). Combined averages of shrub and tree cover were lower, all below 45% (Table 1). Lastly, midstream had the lowest average shade cover with 32% (Table 1)

Table 2: Averaged data for channel conditions of Scott Brook

Stream Section	Channel Conditions									
	Stream Measurements			Substrate Composition						
	Reach length (m)	Average Depth (cm)	Average Wet Width (m)	% Bedrock	% Boulder	% Rocks	% Gravel	% Sand	% Fines	% Embeddedness
Upstream	1000	19	1.2	0	0	6	7	63	24	24
Mid-stream	1800	43	4.5	1	3	16	16	39	25	33
Downstream	400	36	5.9	0	3	19	7	62	9	22

High levels of sand and fines were found in all 3 sections of the brook, making up an average of 74% of the substrate.

Table 3: Averaged data for aquatic habitat conditions of Scott Brook

Stream Section	Aquatic Habitat Conditions								
	Surface Water Measurements						Reach Composition		
	Water Temperature (°C)	Dissolved Oxygen (mg/L)	pH	Conductivity (uS/cm)	Total Dissolved Solids (ppm)	Salinity (ppt)	% Pool	% Riffle	% Run
Upstream	14.3	9.4	6.8	68.5	44.6	0.03	1	6	93
Mid-stream	22.4	3.9	6.6	88.6	58.1	0.04	9	3	88
Downstream	20.4	7.2	6.3	92.9	62.7	0.05	3.4	6.3	90.4

Aquatic habitat conditions in two sections of the stream demonstrated average temperatures above 20 degrees Celsius. Average dissolved oxygen (DO) values in all 3 sections of the stream fell below 9.5 mg/L, which is the minimum amount needed for early aquatic life stages. The minimum amount of dissolved oxygen needed for most forms of life is 6.5 mg/L¹ and one section of the stream did not meet that threshold. Average pH values fell between 6.3 and 6.8. Healthy surface water should have a pH that falls between 6.5 and 9.0². Average conductivity, total dissolved solids and salinity did not indicate signs of saltwater intrusion. Lastly, average reach composition ranged from pool, to riffle, to run, with run being the highest percentage, 88% and above in all 3 sections of the brook. (Table 3).

¹ CCME guidelines for aquatic life, set the minimum of 6.5 mg/L of dissolved oxygen for most forms of life, and a minimum of 9.5 mg/L for early life stages.

² CCME (1987) indicates that healthy surface water should have a pH that falls between 6.5 and 9.0.



Figure 2: Screenshot of the picture of the marsh thistle taken along Scott Brook

During the habitat assessment, photos of plants were recorded and sent to iNaturalist. One photo came back with a note, that it was the first recorded sighting of that plant, the Marsh Thistle, in the province of New Brunswick.

The Atlantic Canada Conservation Centre, based in Sackville, New Brunswick, has plans to collect a sample of the plant for further study and research.

Discussion

Habitat assessments are a great way to find what types of habitats exist, how healthy they are, and identify any issues facing the riparian and aquatic habitats throughout the watershed. EOS assessed Scott Brook with no existing baseline data available. This brook contributes greatly to habitat diversity, the food chain, and water chemistry within the Cape Tormentine Watershed. Scott Brook empties into the Northumberland Strait at Murray Corner.

To take a closer look into stream habitat, EOS used a points system to rank each 100m assessment, to identify potential restoration sites within Scott Brook. Factors were used to assign points to sites based on the quality of habitat (Table 4). Using a points system allows for the identification of healthy habitat or sites in need of restoration. Six factors were used in the points system to define a potential restoration site (Table 4). Each factor was allotted a certain number of points, while taking into consideration the impacts each factor has on the overall health of the watershed. Eleven is the highest amount of points a site can receive, which would indicate very poor habitat conditions, and a site in absolute need of restoration. The point system is an easy way to identify sites in need of restoration; however, sites still require further evaluation to decide which restoration efforts are best suited for the area.

Table 4: Points System for Evaluating Potential Restoration Sites

Factors that Define a Potential Restoration Site	Points
60% or more of the substrate is composed of fines	1
25% or more of the stream banks are bare	2
60% or more of the vegetation present is grass	2
Vegetative shade is under 25%	1
Heavy erosion is over 25%/Slight erosion is over 40%	4
Dissolved oxygen is under 5 mg/L	1

The number of points assigned to each site was used to classify 100 m reaches as healthy (0 - 3 points), healthy with problems (4 - 6 points), or unhealthy (7 - 11 points) (Table 5). Reaches were colour coded as green for healthy, orange for healthy with problems, and red for unhealthy. Colour coding 100m reaches is an easy way to

identify areas of stream habitat in need of restoration. The colour designation has been used by EOS for previous habitat assessments.

Table 5: Potential for Restoration Colour Designation Based on Points System

Green (Healthy)	0 - 3 points
Orange (Healthy with problems)	4 - 6 points
Red (Unhealthy)	7 - 11 points

Scott Brook - Upstream (Reach 1 - Reach 10)

Habitat assessments of Scott Brook began after walking 0.8 km up a resource road to reach the beginning of the stream. 10 assessments were done in the upstream region of the brook. Of these assessments, 4 had a score of 0, meaning they were in good condition, while the remaining sites could benefit from restoration projects. The remaining 6 sites ranged in number of total points. 4 were designated as healthy with problems (4- 6 points), and 2 were designated as healthy (1-3 points). (Figure 2) Of these 10 sites, 5 sites recorded vegetation consisting of at least 60% grasses, and 4 sites recorded banks that were slightly eroded. In terms of in-situ water measurements taken with the multi-parameter probe, 5 sites had dissolved oxygen (DO) values below what is required for early life stages of aquatic life³ and 2 sites had an average pH value below what is suitable for biota⁴.

Photos below demonstrate the state of stream habitat (Figures 2,3,4). Additional site photos can be found in the [Google Map](#), as mentioned above in the methods section. (Figure 1)

³ CCME guidelines for aquatic life, set the minimum of 6.5 mg/L of dissolved oxygen for most forms of life, and a minimum of 9.5 mg/L for early life stages.

⁴ CCME (1987) indicates that healthy surface water should have a pH that falls between 6.5 and 9.0.

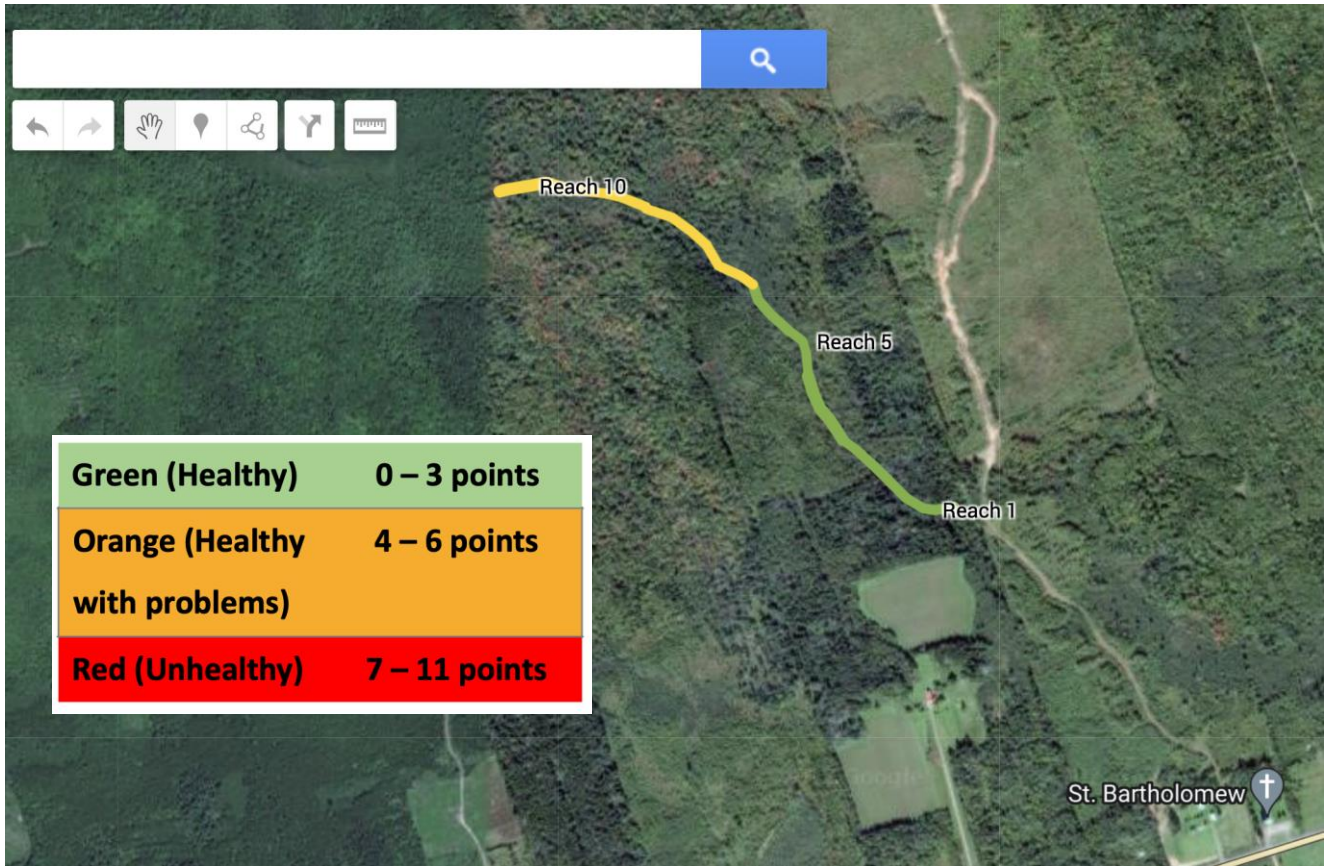


Figure 2: Scott Brook Upstream Point Systems Map (Reach 1-10)



Figure 3: A photo from SB-09 showing grassy vegetation



Figure 4: A photo of SB-04 showing a slightly eroded bank.

Scott Brook - Mid-stream (Reach 11 - 28)

Midstream Scott Brook was accessed after driving 1.5 kilometres down Blair James Road. We were then able to walk alongside the brook. We completed 1.8 kilometres of the brook midstream which resulted in 18 assessments.

None of the 18 assessments had a score of 0, which means that 100% of them could benefit from potential restoration projects. One of the reaches, was impossible to access to collect the majority of the data, because of its depth, so because of the large amount of missing data, we did not give that reach a score. In Figure 5, this reach is coloured white.

The remaining 17 sites ranged in number of total points. 6 of the reaches were designated as healthy (0-3 points), 7 of the reaches were designated as healthy with problems (4-7 points) and 4 of the reaches were designated as unhealthy (8-11 points). Of the 18 sites, half of them had more than 60% grass as vegetation and low shade cover. 7 recorded banks with high percentages of heavy erosion and 3 had high amounts of light erosion. 2 reaches recorded stream banks that were 25% or more bare of vegetation. All of the reaches had average temperatures over the recommended Environment Canada guidelines for streams.⁵ and dissolved oxygen values below what is required for most forms of life.⁶ 5 reaches had pH values below what is suitable for biota⁷.

Photos below demonstrate the state of stream habitat (Figures 5,7,8). Additional site photos can be found in the Scott Brook [Google Map](#), as mentioned above in the methods section (Figure 1)

⁵ According to Environment Canada recommended guidelines, water temperatures of streams should not exceed 20 degrees Celsius.

⁶ CCME guidelines for aquatic life, set the minimum of 6.5 mg/L of dissolved oxygen for most forms of life, and a minimum of 9.5 mg/L for early life stages.

⁷ CCME (1987) indicates that healthy surface water should have a pH that falls between 6.5 and 9.0.

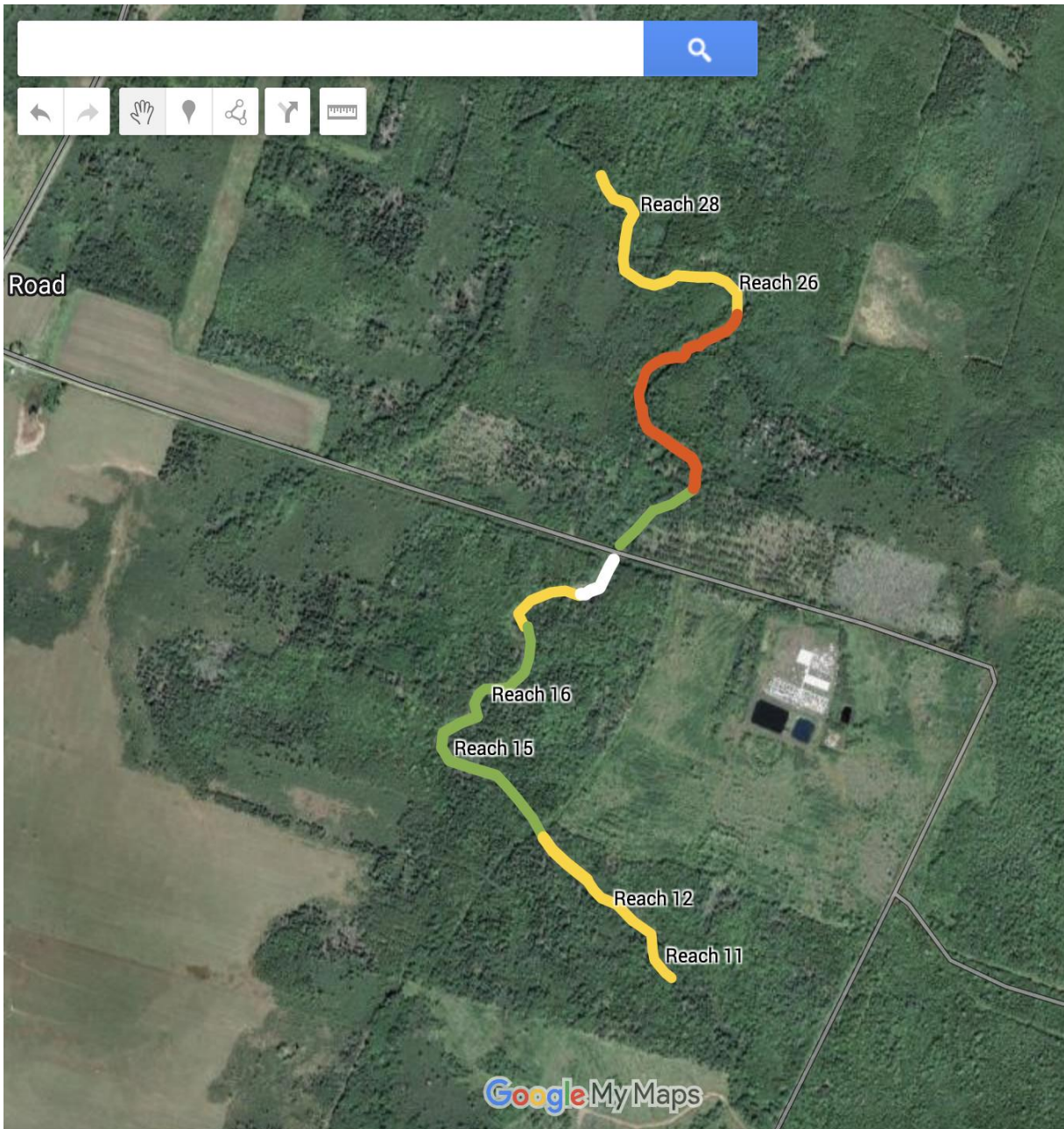


Figure 5: Scott Brook Midstream Point Systems Map (Reach 11-28)



Figure 6: A picture of SB-21, showing eroded banks.



Figure 7: A picture of SB-25, looking downstream, showing low shade cover.



Figure 8: A photo of SB-28, showing grassy banks.

Scott Brook Downstream (Reach 29 - 32)

The downstream section of Scott Brook was accessed where the brook passes under Murray Road. We parked along the shoulder of the road, went down the embankment and made our way upstream from that point. We completed 0.4 kilometres of the brook downstream which resulted in four assessments. This portion of the stream was tidally influenced so the water level rose and fell with the tides.

Two out of the four assessments had a score of 0, which means that the other two reaches could benefit from potential restoration projects. One of the reaches was designated as healthy and had only 1 point. The remaining reach was designated as healthy with problems.

Of the four sites, only one of them had more than 60% grass as vegetation. Two of the reaches (half) had less than 25% vegetative shade cover. No significant erosion was present. Two of the reaches had average temperatures over the recommended Environment Canada guidelines for streams⁸. One of the reaches has no DO value associated with it, because our multi-parameter probe was acting up, and not giving accurate values.

Photos below demonstrate the state of stream habitat (Figures 9,10,11). Additional site photos can be found in the [Google Map](#), as mentioned above in the methods section. (Figure 1)

⁸ According to Environment Canada recommended guidelines, water temperatures of streams should not exceed 20 degrees Celsius.

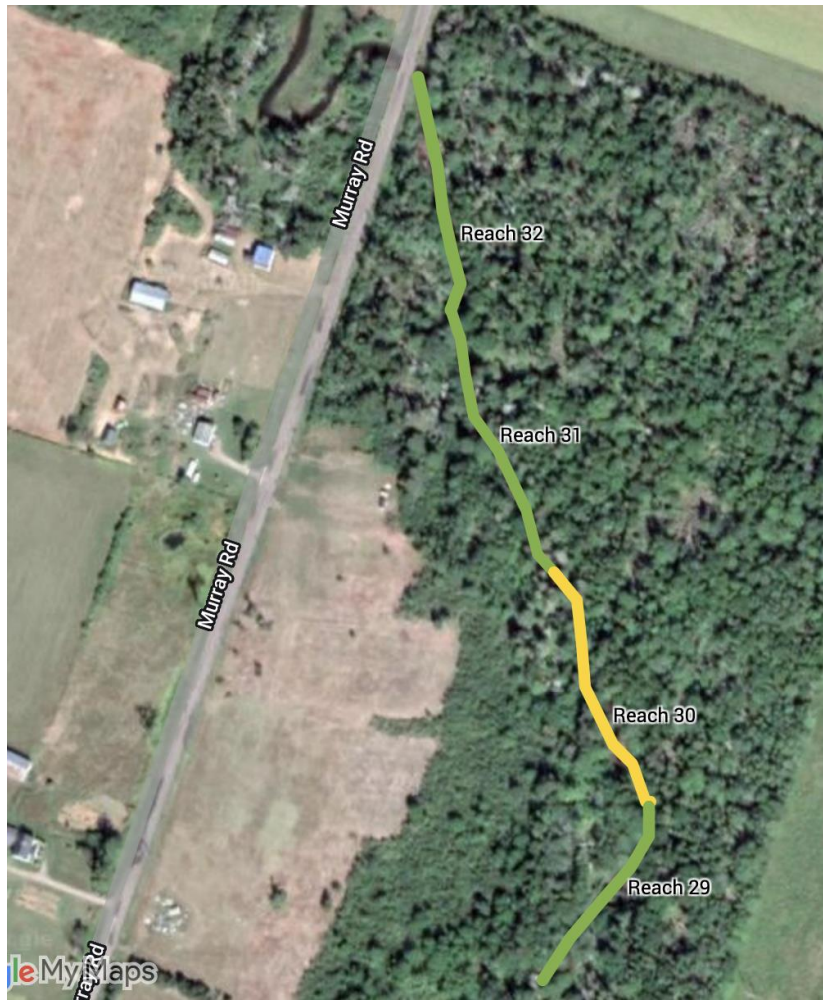


Figure 9: Scott Brook Downstream Point Systems Map (Reach 11-28)

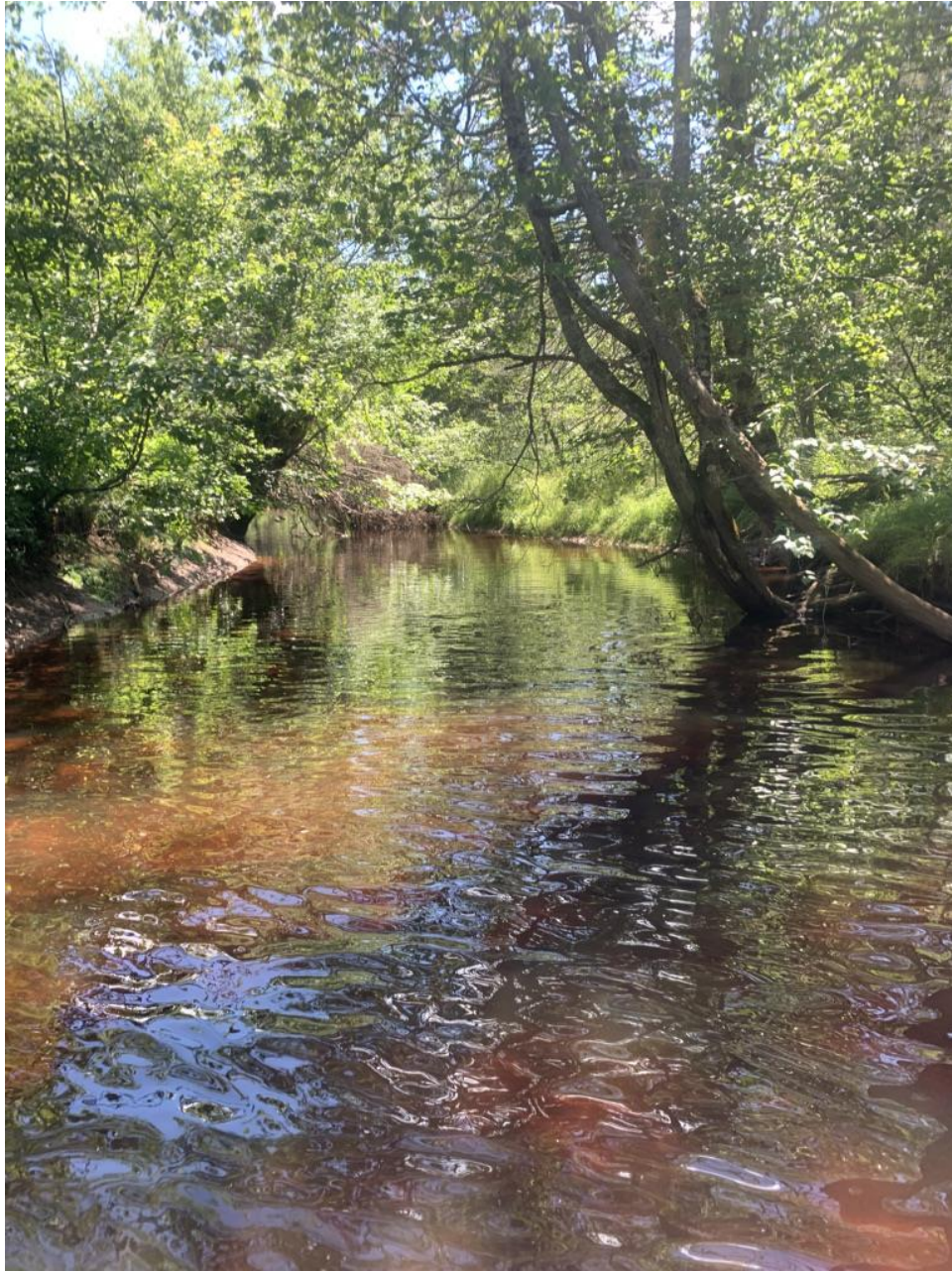


Figure 10: A picture looking upstream at SB-30, showing low shade cover.



Figure 11: A photo showing SB-32, looking downstream, showing a large amount of grass on one side.

Public Engagement

EOS staff created an interactive Google Map which can be accessed by the public on the EOS website at

https://www.google.com/maps/d/edit?mid=1CgMhnfJWsuI9E3uRW1vs6y57nOsJt_k&usp=sharing

The map includes the coordinates and habitat information for each assessment location along the brook. Mapped assessments also included photos of riparian and stream habitat, and a link to raw data sheets.

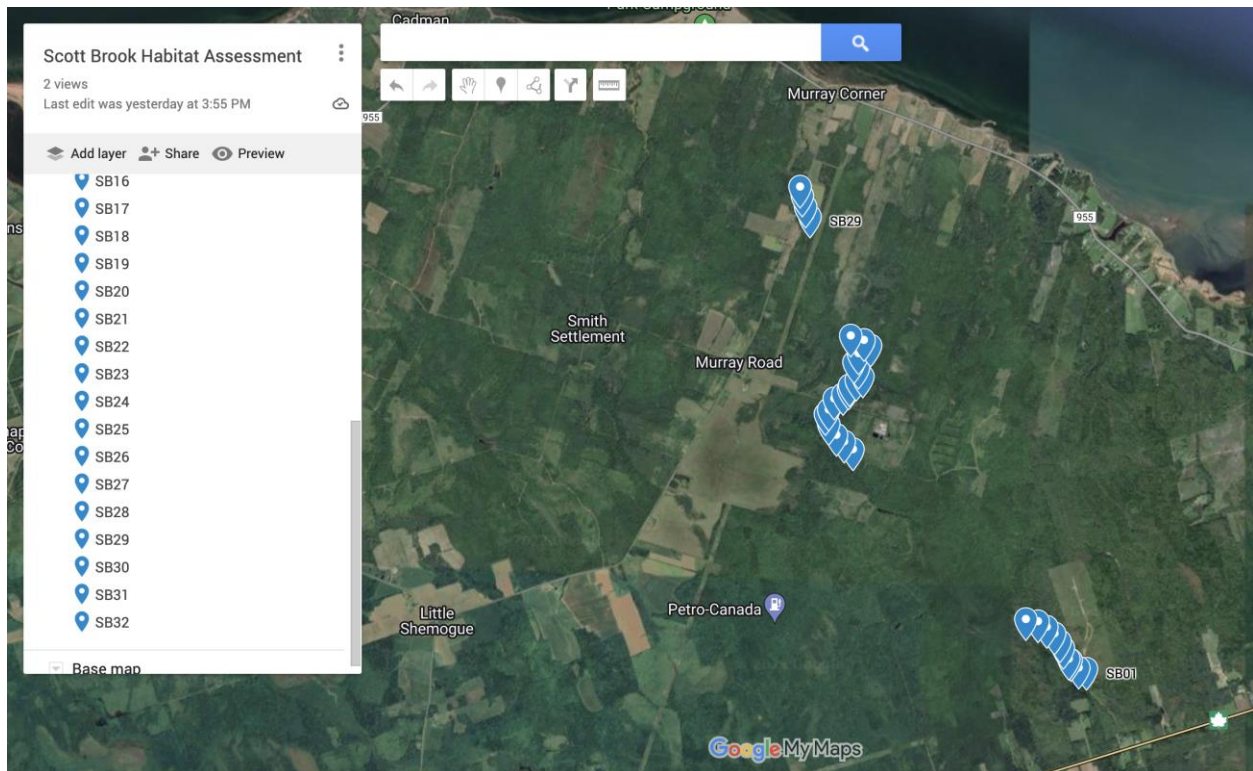


Figure 12: A screenshot of the interactive Google Map of Scott Brook

Further public education about this project and the results include social media posts and the project report is available on the EOS website.

A presentation of results was also made on February 13th, 2023. Further public presentations of the results are planned for the EOS AGM in June 2023. The NB Wildlife Trust Fund has and continues to be promoted as our project funder on our website, social media posts and at events.

Recommendations and Next Steps

In summary, 47% (15 reaches) of assessments of Scott Brook were deemed healthy, 38% (12 reaches) were healthy with problems, and 13% (4 reaches) were unhealthy. One reach was not able to be analyzed because it was not accessible. Common themes were grassy banks, and low shade cover. There were also sites experiencing some form of erosion, high water temperatures and low dissolved oxygen values. Potential restoration efforts could focus primarily on diversifying riparian vegetation through planting native trees and shrubs in areas with a high percentage of grass. High amounts of grass can be associated with other poor stream habitat factors consisting of low shade cover, erosion, and fine sediment. Grass provides little shade cover over stream habitat and has a shallow root system with poor soil stabilizing qualities. Increasing and maintaining deep-rooted, native vegetation along the riparian area will help stabilize stream banks, as well as encourage further growth of vegetation. Therefore, restoration activities for these streams could be as easy as tree planting. However, it is important to keep in mind, these sites would need further investigation before planning restoration activities.

Specific recommendations for the Scott Brook consist of:

- 1) Tree planting in riparian zones for sites with stream banks that are 25% or more bare of vegetation and/or has vegetation consisting of 60% or more grasses. This tree planting will be done in consultation with botanists, biologists or other experts in order to identify the appropriate tree species for the locations and conditions found along the brook.
- 2) Cleaning up debris from certain reaches
- 3) Clearing out the blocked culvert that goes under Blair James Road at Reach 19. This will be done in consultation with environmental groups who have experience doing this, for example, the Petitcodiac Watershed Alliance.

Stream habitat assessment data gathered from this project will provide a record of the current state of stream and riparian health of Scott Brook. Using this data, EOS can plan restoration projects for problem areas and work to prevent potential future problems by maintaining the healthy reaches of streams. In the future, EOS would like to extend assessments of Scott Brook to areas that were not reached, as well as assess other streams within our watershed. These assessments are part of the first steps of establishing baseline conditions for our local watersheds. Identifying existing areas of concern will help with developing a watershed management plan.

Appendix 1 - Habitat Assessment Field Sheet

EOS Habitat Assessment Field Sheet

Date: _____ Reach #: _____ Time: _____

River: Scott Brook Stream order: _____

Set reach length: 30m 50m 100m

Upstream coordinates: N _____ W _____

Downstream coordinates: N _____ W _____

Air temp (°C) _____

Amount of rain in the past 48 hrs: _____

Current weather: _____

Water Quality Data:

pH: _____ DO (ppm): _____ Conductivity (uS/cm): _____ Tds (ppm): _____

Salinity(ppt): _____ Water Temp (°C): _____

Channel Characteristics

Average depth (cm)

Depth	0m	25m	50m	75m
¼ depth				
½ depth				
¾ depth				

Average: _____

Wet Widths

Section	0m	25m	50m	75m	Avg
Wet width (cm)					

Bed Form Composition

amount (%)	0m	25m	50m	75m	Avg
Pool					
Riffle					
Run					

Bank Conditions:

Left Bank	0m	25m	50m	75m	Avg
Height (cm)					
% stable					
% slightly eroded					
% heavily eroded					

Right Bank	0m	25m	50m	75m	Avg
Height (cm)					
% stable					
% slightly eroded					
% heavily eroded					

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SUBSTRATE CHARACTERISTICS

Substrate Type Cover %	0m	25m	50m	75m	Avg
Fines					
Sand					
Gravel					
Rocks					
Boulder					
Bedrock					
Embeddedness (%)					

RIPARIAN CHARACTERISTICS

Shade Cover Assessment:

Bank Position Shade Cover %	0m	25m	50m	75m	Average
Left Bank					
Right Bank					

Vegetation Cover Assessment:

Vegetation Type Left Bank % Cover	0m	25m	50m	75m	Average
Bare					
Grasses					
Shrubs					
Trees					

Vegetation Type Right Bank % Cover	0m	25m	50m	75m	Average
Bare					
Grasses					
Shrubs					
Trees					

Other general information:

Notable issues: check all that apply

dump site

man-made obstruction

fallen trees

dead fish/animals

beaver dam

clear cut

Notes:

Appendix 2 - Data Tables

Station	Upstream Northing	Upstream Westing	Reach Length (m)	Water Temp (°C)	DO (ppm)	pH	Conductivity (uS/cm)	TDS (ppm)	Salinity (ppt)	Average Depth (cm)	Average Width (cm)	%pool	%riffle	%run	LB Average Height (cm)	LB %Stable	LB %Slightly Eroded	LB %Heavily Eroded
SB-01	46.1077	-63.91958	100	13.50	8.50	6.45	72.90	47.50	0.03	21.70	134.50	0.00	5.00	95.00		100.00	0.00	0.0
SB-02	46.10789	-63.92086	100	13.40	8.80	6.46	69.10	44.90	0.03	18.00	205.25	0.00	5.50	94.50	35.00	78.00	19.50	0.0
SB-03	46.10867	-63.922	100	13.60	9.20	6.75	63.00	41.00	0.03	22.63	131.25	1.25	8.75	90.00	51.00	95.00	5.00	0.0
SB-04	46.10887	-63.92238	100	15.80	9.20	6.69	53.50	35.10	0.02	17.20	111.25	0.00	3.75	96.25	20.75	83.33	23.75	0.0
SB-05	46.10996	-63.92322	100	15.80	8.90	6.8	54.00	35.10	0.02	23.29	116.50	5.00	7.50	87.50	16.00	96.25	3.75	0.0
SB-06	46.11076	-63.92371	100	13.00	9.80	6.9	69.80	45.55	0.03	19.00	104.75	1.25	3.75	96.25	34.50	60.00	30.00	10.0
SB-07	46.11155	-63.92458	100	13.70	10.01	6.83	70.20	45.55	0.03	15.17	113.25	0.00	6.25	93.75	28.25	40.00	60.00	0.0
SB-08	46.11226	-63.92576	100	15.00	9.81	6.91	69.80	45.55	0.03	23.25	122.75	0.00	3.75	96.25	37.25	62.50	37.50	0.0
SB-09	46.11288	-63.92726	100	15.60	9.41	6.95	69.60	45.55	0.03	20.81	121.75	0.00	6.25	93.75	26.25	42.50	52.50	5.0
SB-10	46.11316	-63.92914	100	13.70	10.00	6.95	92.60	59.80	0.04	13.4	74.25	2.50	8.75	88.75	12.25	38.75	61.25	0.00
SB-11	46.13148	-63.95613	100	23.1	3.63	6.69	109.70	71.50	0.05	55.67	348	0.00	1.25	98.75	8.67	100.00	0.00	0.00
SB-12	46.13224	-63.95738	100	22.8	3.68	6.91	107.20	72.15	0.05	65.50	429.25	0.00	0.00	100.00	14.00	100.00	0.00	0.00
SB-13	46.13301	-63.95859	100	21.6	4.2	6.95	105.90	68.90	0.05	39.58	385.00	0.00	1.25	98.75	36.00	95.00	5.00	0.00
SB-14	46.13419	-63.95982	100	22.6	3.5	6.61	100.40	65.00	0.05	56.33	585.50	0.00	0	100	8.75	95.00	5.00	0.00
SB-15	46.1352	-63.96033	100	23.1	3.1	6.64	92.10	62.40	0.04	-	-	0.00	0	100	-	-	-	-
SB-16	46.13572	-63.95976	100	23.00	3	6.59	87.40	56.55	0.04	-	-	0.00	0.00	100.00	-	-	-	-
SB-17	46.13686	-63.95903	100	22.70	2.74	6.56	76.00	51.35	0.04	-	-	-	-	-	-	-	-	-

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SB-18	46.13741	-63.9576	100	22.70	3.56	6.56	77.10	50.05	0.04	-	-	0.00	0.00	100.00	-	-	-	-
SB-19	46.15574	-63.96329	100	23.00	3.74	6.44	71.60	48.10	0.03	-	-	-	-	-	-	-	-	-
SB-20	46.138329	63.956488	100	21.90	4.67	6.22	85.90	55.90	0.04	48.08333333	540.75	20.00	16.25	63.75	73.50	76.25	16.25	7.50

Station	RB Average Height (cm)	RB %Stable	RB %Slightly Eroded	RB % Heavily Eroded	% Embeddedness	%fines	%sand	%gravel	%rocks	%boulder	%bedrock	LB %Shade Cover	LB %bare	LB % grasses	LB %shrubs	LB %trees	RB %Shade Cover	RB %bare	RB % grasses	RB %shrubs	RB %trees	POINTS
SB-01		100	0.00	0	38.75	0.00	37.50	18.75	42.50	0.00	0.00	51.25	0.00	40.00	45.00	15.00	51.25	0.00	36.25	45.00	18.75	0
SB-02	30.00	95.00	5.00	0	62.50	8.75	45.00	33.75	11.25	1.25	0.00	51.25	0.00	38.75	52.50	8.75	56.25	0.00	30.00	52.50	17.50	0
SB-03	21.00	87.50	12.50	0	23.33	55.00	27.50	2.50	2.50	0.00	0.00	63.75	0.00	20.00	62.50	17.50	56.25	2.50	42.50	26.25	28.75	0
SB-04	29.75	92.50	7.50	0	51.25	20.00	73.75	6.25	0.00	0.00	0.00	56.25	0.00	76.25	15.00	8.75	56.25	1.25	72.50	17.50	11.25	2
SB-05	13.75	97.50	2.50	0	20.00	22.50	77.50	0.00	0.00	0.00	0.00	62.50	0.00	72.50	25.00	2.50	60.00	0.00	66.25	27.50	6.25	2
SB-06	25.00	70.00	30.00	0	0.00	37.50	62.50	0.00	0.00	0.00	0.00	61.25	0.00	55.00	41.25	3.75	65.00	0.00	58.75	37.50	3.75	0
SB-07	30.00	36.25	63.75	0	20.00	7.50	90.00	2.50	0.00	0.00	0.00	38.75	0.00	70.00	30.00	0.00	38.75	0.00	68.75	30.00	1.25	6
SB-08	40.25	40.00	63.75	12.5	0.00	27.50	72.50	0.00	0.00	0.00	0.00	61.25	0.00	58.75	37.50	3.75	61.25	0.00	60.00	32.50	7.50	4
SB-09	30.25	35.00	63.75	5	25	40.00	58.75	1.25	0.00	0.00	0.00	75.00	0.00	68.75	18.75	12.50	70.00	0.00	68.75	18.75	12.50	6
SB-10	10.75	42.50	57.50	0	0.00	18.75	81.25	0.00	0.00	0.00	0.00	45.00	0.00	62.50	35.00	2.50	45.00	0.00	65.00	33.75	1.25	6
SB-11	13.75	100.0	0.00	0	0.00	42.50	57.5	0.00	0.00	0.00	0.00	3.75	0	70.00	16.25	2.50	13.75	0.00	67.50	37.50	2.50	4
SB-12	6.50	100.0	0.00	0	0.00	47.50	52.50	0.00	0.00	0.00	0	2.50	0	88.75	11.25	0.00	18.75	11.25	43.75	45.00	2.50	4
SB-13	42.00	74.50	17.50	7.5	10.00	27.50	55.00	8.75	5.00	1.25	0.00	10.00	1.25	67.5	31.25	0.00	37.50	7.50	52.50	28.75	12.50	4
SB-14	10.00	60.00	2.50	0	10.00	28.75	56.25	15.00	0.00	0.00	0.00	61.25	5	43.75	12.50	38.75	50.00	0.00	46.25	43.75	10.00	1
SB-15	-	-	-	-	-	-	-	-	-	-	-	45.00	6.67	38.33	5.00	50.00	50.00	25.00	10.00	2.50	62.50	2
SB-16	-	-	-	-	-	-	-	-	-	-	-	25.00	2.50	31.25	11.25	55.00	33.75	17.50	8.75	17.50	56.25	1

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SB-17	-	-	-	-	-	-	-	-	-	-	-	33.75	7.50	27.5	10.00	55.00	33.33	3.33	6.67	3.33	41.67	1
SB-18	-	-	-	-	-	-	-	-	-	-	-	20.00	25.00	10	0.00	65.00	20.00	20.00	2.5	0.00	77.50	4
SB-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
SB-20	76.75	60.00	16.25	22.5	30.00	0.00	16.25	25.00	52.5	6.25	0.00	38.75	5.00	28.75	58.75	7.50	37.50	0	37.50	57.50	5.00	1

Station	Upstream Northing	Upstream Westing	Reach Length (m)	Water Temp (°C)	DO (ppm)	pH	Conductivity (uS/cm)	TDS (ppm)	Salinity (ppt)	Average Depth (cm)	Average Width (cm)	%pool	%riffle	%run	LB Average Height (cm)	LB %Stable	LB %Slightly Eroded	LB %Heavily Eroded
SB-21	46.138961	-63.955594	100	22.90	4.6	6.76	85.40	55.25	0.04	28	381.75	0.00	0.00	100.0	79.00	75	17.50	7.50
SB-22	46.139341	-63.954468	100	22.90	3.67	6.72	85.30	55.25	0.04	26.58	410.25	0.00	2.5	97.50	60.00	58.75	10.00	31.25
SB-23	46.140223	-63.955239	100	22.5	4.54	6.70	85.00	55.25	0.04	45.08	422.75	0.00	0.00	100.0	73.75	57.50	37.50	5.00
SB-24	46.140834	-63.955899	100	22	4.6	6.20	87.00	56.55	0.04	58.33	502.5	0.00	0.00	100.0	51.25	11.25	56.25	32.50
SB-25	46.141818	-63.955257	100	23	3.81	6.27	83.80	56.55	0.04	62.17	519.00	65.00	0.00	35.00	57.25	60.00	22.50	17.50
SB-26	46.14256	-63.95328	100	20.9	3.50	6.22	85.30	55.25	0.04	31.67	515.00	47.50	1.25	51.25	61.00	30.00	35.00	35.00
SB-27	46.1432	-63.95435	100	21.1	5.07	-	84.80	55.25	0.04	23.67	398.75	10.00	5.00	85.00	39.75	30.00	37.50	32.50
SB-28	46.14374	-63.95635	100	20.9	5.26	6.9	84.50	54.60	0.04	13.92	460.00	2.50	13.75	83.75	52.00	2.50	80.00	17.50
SB-29	46.15651	-63.96272	100	20.3	-	6.17	89.30	57.85	0.04	40.5	517.50	3.75	5.00	91.25	74.25	91.25	8.75	0.00
SB-30	46.15755	-63.96336	100	20.1	7.87	4.46	84.60	60.45	0.04	46	652.50	2.50	3.75	93.75	64.25	71.25	27.50	1.25
SB-31	46.15874	-63.96403	100	19.7	7.80	7.00	105.4	68.25	0.05	40.92	752.00	1.25	5.00	93.75	68.75	73.75	26.25	0.00
SB-32	46.15979	-63.96425	100	19.1	8.01	6.84	105.1	76.70	0.06	32.08	705.00	1.25	7.50	91.25	48.75	90.00	10.00	0.00

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Station	RB Average Height (cm)	RB %Stable	RB %Slightly Eroded	RB % Heavily Eroded	% Embeddedness	%fines	%sand	%gravel	%rocks	%boulder	%bedrock	LB %Shade Cover	LB %bare	LB % grasses	LB %shrubs	LB %trees	RB %Shade Cover	RB %bare	RB % grasses	RB %shrubs	RB %trees	POINTS
SB-21	69.75	60.00	30.00	10	62.50	20.00	30.00	47.50	2.5	0.00	0.00	38.75	0.00	72.50	25.00	2.50	42.50	0.00	60.00	32.50	7.50	3
SB-22	66.00	63.75	20.00	16.25	47.50	27.50	33.75	32.50	3.75	2.50	0.00	30.00	1.25	56.25	12.50	30.00	11.25	1.25	83.75	10.00	5.00	8
SB-23	77.50	37.50	30.00	32.5	40.00	32.5	52.50	11.25	2.50	1.25	0.00	5.00	0.00	56.25	27.50	16.25	18.75	0.00	77.50	6.25	16.25	8
SB-24	63.75	25.00	38.75	35	47.50	33.75	51.25	7.50	6.25	1.25	0.00	2.50	0.00	96.25	3.75	0.00	16.25	1.25	70.00	11.25	17.50	8
SB-25	42.00	37.50	30.00	32.5	37.50	20.00	42.50	7.50	12.50	7.50	10.00	25.00	10.00	63.75	18.75	10.00	20.00	0.00	80.00	7.50	10.00	8
SB-26	53.25	58.75	28.75	12.5	45.00	18.75	26.25	21.25	35.00	3.75	7.50	46.25	5	47.50	17.50	30	51.25	2.50	56.25	35.00	6.25	5
SB-27	92.00	15.00	50.00	35	45.00	12.50	23.75	27.50	32.50	3.75	0.00	73.75	1.25	58.75	18.75	21.25	78.75	15.00	31.25	3.25	53.75	4
SB-28	72.75	30.00	22.50	47.5	50.00	7.50	11.25	7.50	61.25	5	0.00	57.50	3.75	66.25	5.00	27.50	57.50	16.25	33.75	11.25	38.75	6
SB-29	70.50	71.25	27.50	1.25	35	7.50	71.25	3.125	15.63	2.50	0.00	57.50	3.75	54.75	5.00	16.25	78.75	2.50	53.75	1.25	31.25	0
SB-30	67.25	81.25	18.75	0	3.75	5.00	83.75	7.50	2.50	1.25	0.00	23.75	2.5	68.75	7.5	21.25	30.00	2.50	53.75	16.25	26.25	5
SB-31	62.75	78.75	21.25	0	5	7.50	81.25	3.75	5.00	2.50	0.00	21.25	0	57.50	5	32.50	23.75	0.00	57.50	20.00	22.50	1
SB-32	42.50	90.00	10.00	0	7.50	2.50	86.25	5.00	10.00	1.25	0	47.50	0.00	55	2.50	42.50	31.25	0.00	53.75	17.50	28.75	0