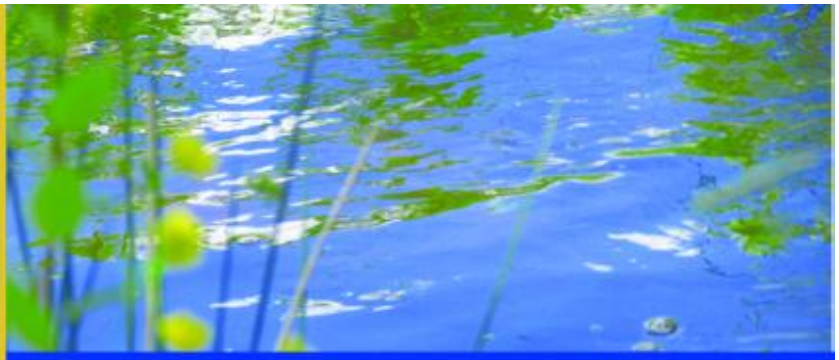

2012 Field Report

LaHave River Watershed Project

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Bluenose Coastal Action Foundation

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LaHave River Watershed Project

The goal of the LaHave River Watershed Project (LRWP) is centered around long term water quality monitoring; however, the main idea is to address environmental impacts on the system by providing a long term record of the river's health and proactively reducing stressors / harmful aquatic impacts by enhancing watershed education in the local community. Fifteen sample sites are monitored bi-weekly to document the natural variability along the LaHave system and track changes in general water quality. Sites are located at each major tributary entering the main branch, under each of the outflows from four sewage treatment facilities along the river, and in the headwaters where there is little human impact. Parameters monitored bi-weekly include: temperature, dissolved oxygen, pH, conductivity, total dissolved solids, and salinity. On a monthly basis, water samples are collected and taken to a certified laboratory to test levels of phosphorus, nitrogen, nitrates & nitrites, fecal coliforms, total suspended solids, and chloride. Two times a year, the certified lab will also provide a full metals test. Monitoring and water sampling began in August 2007, and has been extremely successful in terms of creating a record of the river's health, forming networks, and engaging the local community. After nearly 5 years of data collection, BCAF now has an excellent baseline dataset for the LaHave River.

Fish Habitat Restoration Project

Silver Mill Brook is a tributary of the LaHave River and runs through local property owner Kevin Veinotte's farm (Figure 1). Historically, this brook was straightened to maximize farm land and was accessible to cattle; however, nine years ago the brook became protected by the installation of an electric fence and cattle access was significantly limited. The goal of this summer's restoration project was to physically improve the in-stream structure of the brook, to slowly improve fish habitat and to help re-establish a natural meander pattern. Digger logs create pools and gravel beds immediately downstream of the log, which serve as cover, resting areas, and spawning areas for fish travelling upstream. Digger logs also clean and oxygenate the water creating quality habitat for aquatic invertebrates (Figure 2).

Figure 1. A photo of Silver Mill Brook, a tributary of the LaHave River.

Figure 2. Picture of a digger log installed in Silver Mill Brook.

Digger Log Installation

Logs are cut to length to fit a 60 degree angle parallel to the bank of the brook. This angle helps direct the water into the bank to create the meander. The logs are also placed at a 3-5 degree angle, with the lower end upstream. The holes are drilled into the log for the 5/8" length of rebar that is used to secure the log into the substrate of the brook. A channel in the substrate is cleared for the log; pickaxes and

shovels are normally used. Ideally, the channel is dug so the water cascades over the high portion of the log. Once installed, a pool is dug on the downstream side of the log. The rock and gravel removed from downstream can be used on the upstream side to create a ramp and a riffle. The ramp is important, with it the water will flow up to the peak of the log and then cascade down over it where it will begin to erode away parts of the streambed and create a larger pool (Figure 2). Weeks after installation, previously absent schools of fish were observed in the pools below the digger logs. During the summer of 2012, 24 digger logs were installed in Silver Mill Brook (Figure 3).

Figure 3. Measuring the gradient of a digger log during installation.

Riparian Health Assessments

Using a portable Trimble Unit and Arc Pad software, LRWP staff mapped dozens of kilometres of riparian area along branches of the LaHave River and its tributaries (see Appendix 1). The riparian area is the land around a river or stream that is characterized by water-loving plants. Every time the riparian area appears to change, a series of 13 questions related to the riparian area are answered, determining an associated health with the traced region. After the questions are completed, the unit records the data along the line it just traced. A score above 80 is excellent health, from 60-80 is moderate, and below 60 is poor. By completing these assessments it can be determined which riparian areas are unhealthy and where future restoration efforts should be focused.

Figures 4 & 5. LRWP staff learning how to use the Trimble unit for conducting Riparian Health Assessments.

Fish Friends Program

This year Grade 4 classes from schools in Bridgewater, Mahone Bay, and Gold River participated in the Fish Friends Program. This program requires a commitment from BCAF of about 4 months. In early February, eyed Atlantic salmon eggs were collected from the Coldbrook fish hatchery and approx 300 were delivered to each participating school. Once delivered, the Grade 4 classes become the guardians of the eggs. The students are responsible for the cleaning of the tank and filters, the removal of dead eggs, temperature regulation, and after hatching the feeding of the fry. During the spring semester the Grade 4 students learn about the life history of the Atlantic salmon and other habitat based information associated with their curriculum outcomes. In previous years, all fish have been released into the Mushamush River during a single "Fish Release Day." However, this year due to a smaller number of participating schools, each class chose their own location and release date.

- Bayview Community School – Former NS Power dam site, Mushamush River
- Gold River/Western Shore Elementary School – Mushamush River near the Lutheran Church Camp, Big Mushamush
- Bridgewater Elementary School – Wiles Brook, LaHave River

Figure 6. Project Coordinator, Andy Breen, talking to the kids about releasing the fish at Camp Mushamush.

NSLC Adopt-A-Stream Fish Habitat Restoration Plan Template

With funding from the NSLC Adopt-A-Stream (AAS) program, the Nova Scotia Salmon Association has created a Fish Habitat Restoration Plan template on their website that can be downloaded and completed by community groups / organizations. It is designed so the user can fill out only the necessary sections that pertain to their specific watercourse with help from AAS staff if needed. It consists of five sections. The first is always the same and states the restoration plan objectives. The second part contains a table that is filled out by the user that contains introductory information about the watershed. Part three consists of many 1:10,000 topographical maps where site specific information about the watershed can be mapped. Part four is a table for problems and prescriptions. Here the user takes the problems they noted while walking the stream and identifies them with coordinates and descriptions and then offers a potential method for restoration that could be used. The final section consists of a restoration plan summary. It is an analysis of all the data collected and a plan pertaining to the restoration efforts suggested in section 4.

BCAF has been working on developing a Fish Habitat Restoration Plan for the LaHave River Watershed; however, due to the large size of the watershed, BCAF has decided to break the area down into smaller sub-watersheds. In 2012, the focus of the fish habitat restoration plan template was the West Branch of

the LaHave River. LRWP staff began collecting data and information for the West Branch on days when they were not working on the other main components of the project. To date, this work has comprised of the following activities:

- Riparian health assessments were conducted along approximately 53km of the West Branch of the LaHave River.
- Collection of local knowledge and professional expertise was initiated within the community and informational interviews with local residents, NS Department of Fisheries and Aquaculture – Inland Fisheries Division staff, as well as members of the LaHave River Salmon Association were conducted.
- BCAF has begun initial GIS mapping of the data collected for the West Branch, complete with descriptions to highlight potential future stream restoration projects.
- Historic reports, documents, and data for this section of the watershed have been compiled and reviewed in order to obtain all pertinent information about the West Branch. This information includes water quality data, electrofishing surveys, as well as enhancement efforts regarding releases of salmon and trout.

BCAF staff intend on drafting the Fish Habitat Restoration Plan for the West Branch sub-watershed over the winter months.

Appendix 1. Riparian Health Assessments completed during 2012 field season.

Riparian Area Health Assessments 2012

Day	Stream Name	Kilometres Assessed (km)
1	West Branch LaHave	3
2	Zwicker Brook	4.2
3	West Branch LaHave	3
4	West Branch LaHave - Unnamed Tributary #3	3.6
5	West Branch LaHave - Unnamed Tributary #4	4.9
6	West Branch LaHave	6.2
7	West Branch LaHave - Unnamed Tributary #5	1.3
	West Branch LaHave - Unnamed Tributary #6	1.2
8	West Branch LaHave	2
9	West Branch LaHave - Unnamed Tributary #8	4.1
10	West Branch LaHave	5
	Tributary leading to Cooks Lake	1
11	West Branch LaHave	5.1
12	West Branch LaHave	3.4
13	Ash Brook	4.8
Total		**52.8**