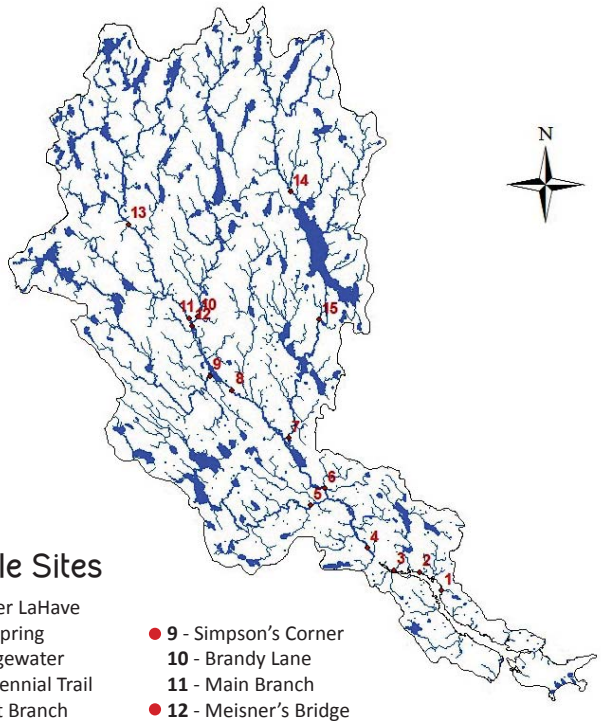
Bluenose Coastal Action Foundation

LaHave River Watershed 2014 Report Card

The LaHave River Watershed is one of the largest watersheds in Southwestern Nova Scotia (1,700 km²), with its headwaters reaching into Annapolis and Kings Counties and the majority of the watershed stretching across Lunenburg County. This highly branched river system has several large sub-watersheds and many tributaries. The health of the LaHave River is influenced by the interaction of air, land, and water throughout the entire watershed, which is why the water quality monitoring program was designed at a watershed scale. Fifteen sample sites were chosen in order to capture the water conditions throughout the entire watershed. Monitoring occurs from the headwaters to the estuary, including the confluence of each major sub-watershed branch, the main stem of the river, and downstream of three waste water treatment plants. These sites are monitored on a monthly basis for physical, chemical, and biological water quality parameters using a YSI Professional Plus water meter and through the collection of water samples for laboratory analysis. In addition, a full suite of metals are monitored on a bi-annual basis. With over 7 years of water quality data, the monitoring program has contributed greatly to our understanding of both the natural variability of the system and the environmental impacts of various activities throughout the watershed. This report card summarizes the water quality conditions of the LaHave River Watershed in 2014.

Water Quality Monitoring Sites in the LaHave River Watershed



Sample Sites

- **1** - Upper LaHave
- **2** - Dayspring
- **3** - Bridgewater
- **4** - Centennial Trail
- **5** - West Branch
- **6** - Northfield
- **7** - Pinehurst
- **8** - New Germany
- **9** - Simpson's Corner
- **10** - Brandy Lane
- **11** - Main Branch
- **12** - Meisner's Bridge
- **13** - Falkland Ridge
- **14** - Franey Corner
- **15** - Sherbrooke

grab sample site

LaHave River Watershed Project

Bluenose Coastal Action Foundation initiated the LaHave River Watershed Project (LRWP) in 2007, in response to increasing public concern over the health of the river. The purpose of the project is to identify and reduce harmful environmental impacts within the LaHave River Watershed. Forestry, farming, recreation, and rural development are widespread throughout the system, while industrial and urban development are mostly restricted to the lower reaches of the watershed. These various forms of land-use can have a significant impact on the health of the entire watershed, including the LaHave River Estuary. Goals of the project include the development of a watershed management plan and a long term monitoring program to assess the river's health. Project activities include monthly water quality monitoring, habitat assessments, restoration projects, and community outreach and education. The LRWP is guided by an advisory committee representing various government departments, academia, industry, non-profit organizations, and community members.

Water Quality Parameters

Water Temperature is an important indicator of water quality, which plays a significant role in the health and productivity of aquatic ecosystems. Temperatures above 20˚C cause stress for cold-water fish such as salmon and trout, and prolonged exposure to water above 24˚C can cause death. Aquatic organisms have optimal temperature ranges and will become stressed and seek new habitat in response to extreme temperature fluctuations.

Fecal Coliform bacteria live in the intestines of warm-blooded animals. The presence of fecal coliform bacteria in freshwater indicates the possible presence of harmful disease-causing pathogens. Sources of contamination include malfunctioning or straight pipe septic systems, livestock, and aquatic wildlife. High levels of fecal coliforms are most often observed in the lower reaches of the watershed. The presence of illegal straight pipe sewage systems along the river is suspected to be the greatest contributor to this contamination.

Dissolved Oxygen is an important water quality indicator that influences aquatic ecosystem health. Dissolved oxygen levels below 6.5 mg/L cause stress for aquatic organisms, such as cold-water fish, and extremely low levels can lead to fish kills. Algal blooms, in response to sewage pollution and nutrient run-off, can lead to low dissolved oxygen levels.

Nutrients are essential for plant and animal life and occur naturally in the environment. Excessive levels of nitrogen and phosphorus from anthropogenic sources such as agricultural run-off or wastewater effluent can lead to algal blooms and low dissolved oxygen.

pH indicates the acidity or alkalinity of water, with a pH of 0 being most acidic, 7 being neutral, and 14 being most basic. A pH range of 6.5 – 9.0 is ideal for the health and protection of aquatic life. The geology of the LaHave River Watershed provides a poor buffering capacity against acid precipitation, and low pH values are often observed.

Watershed Stewardship: how you can help protect the health of the LaHave River watershed

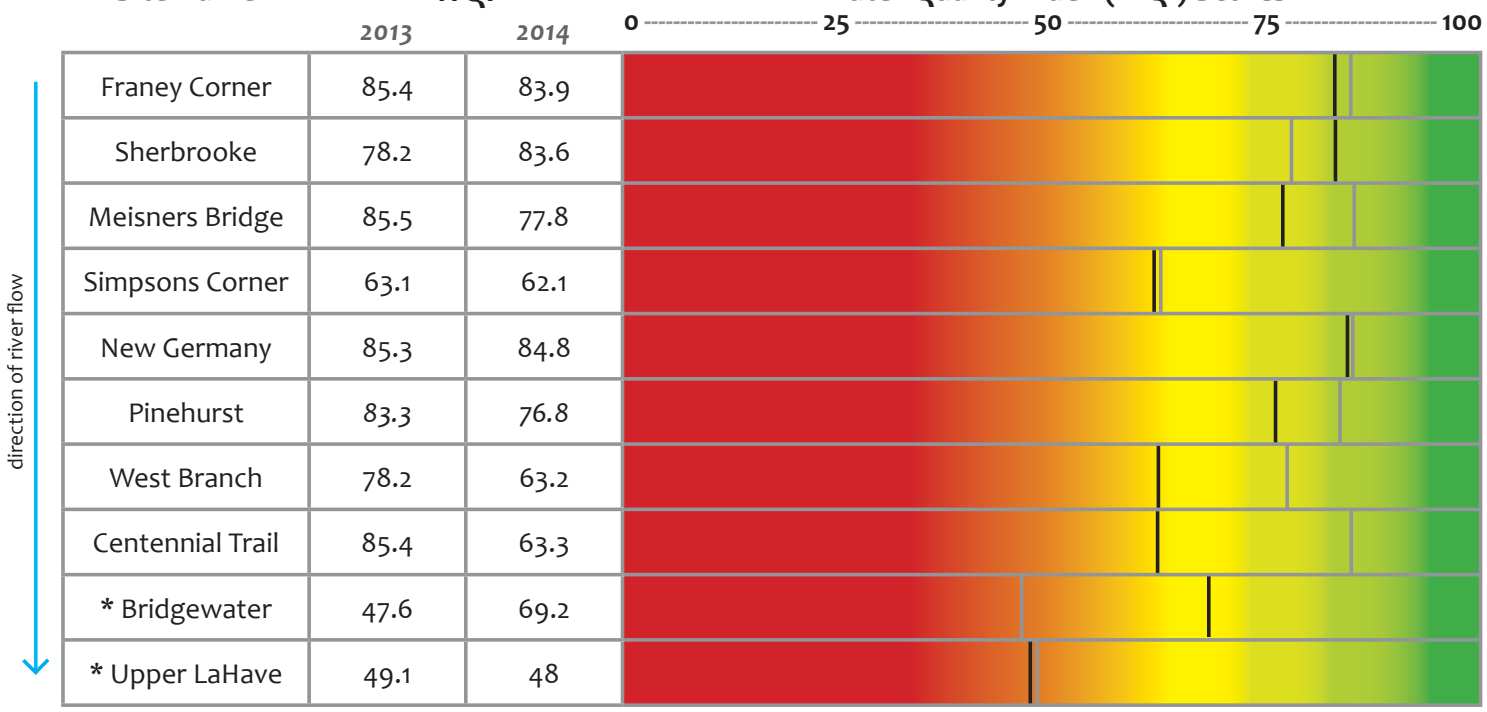
Maintain healthy shorelines. Healthy riparian habitats help to reduce shoreline erosion, control flooding, filter run-off pollutants, and provide shade for in-stream fish habitat.

Maintain your septic system. Have your septic system pumped and inspected regularly to prevent the contamination of drinking water and the environment. If you have a straight pipe septic system, which discharges raw human sewage directly into watercourses, have it replaced immediately.

Keep livestock out of watercourses. Install fencing along watercourses and provide alternative watering sources to prevent shoreline erosion, sedimentation, and fecal contamination caused by wading livestock.

Avoid the use of chemicals. Use environmentally-friendly household products and avoid the use of pesticides and herbicides on your property. Run-off and wastewater discharge will carry these harmful chemicals into your local watercourses.

Site Name	WQI 2013	WQI 2014
Franey Corner	85.4	83.9
Sherbrooke	78.2	83.6
Meisners Bridge	85.5	77.8
Simpsons Corner	63.1	62.1
New Germany	85.3	84.8
Pinehurst	83.3	76.8
West Branch	78.2	63.2
Centennial Trail	85.4	63.3
* Bridgewater	47.6	69.2
* Upper LaHave	49.1	48



Parameters Used to Calculate WQI:

- Total Nitrate
- Dissolved Oxygen
- pH
- Water Temperature
- Fecal Coliform
- Total Phosphorus
- Total Dissolved Solids
- Total Iron (estuarine sites only)

| = 2013 | = 2014 |

* estuarine sample site

\+ Iron was only sampled once in 2014

The Water Quality Index (WQI) provides a general description of water quality. Using the Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines, the WQI combines multiple parameters in order to summarize complex data into a single value ranging from 0 (worst water quality) to 100 (best water quality). This index is calculated based on the number of parameters that do not meet water quality guidelines, the number of times the guidelines are not met, and the amount by which the guidelines are exceeded.

Unfortunately, the **WQI scores indicate a decrease in water quality**, from 2013 to 2014, at 8 of the 10 sample sites included in the analysis. While this score only provides a broad description of water quality, it is certainly cause for concern that requires further investigation into the reasons for declining water quality in the LaHave River Watershed.

WQI	Category
95 - 100	**EXCELLENT** • absence of threat • close to pristine levels
80 - 94	**GOOD** • minor degree of threat • conditions rarely depart from desired levels
65 - 79	**FAIR** • occasionally threatened • sometimes not at desired levels
45 - 64	**MARGINAL** • frequently threatened • often not at desired levels
0 - 44	**POOR** • almost always threatened • usually not at desired levels

Bluenose Coastal Action Foundation

Coastal Action is a community-based charitable organization with a mandate to address environmental concerns along the South Shore of Nova Scotia.

Coastal Action's goal is to promote the restoration, enhancement, and conservation of our ecosystems through research, education, and action.

Coastal Action has over 20 years of experience managing environmental monitoring and restoration projects, fisheries research, species at risk projects, and community and sustainability initiatives throughout the South Shore region of Nova Scotia.

Coastal Action Projects in 2014

Atlantic Whitefish Recovery Project. Monitoring of the Hebb Dam fishway, invasive species mitigation measures, and monitoring of the Atlantic Whitefish population.

American Eel and Elver Abundance Study. East River, Chester elver abundance study, Oakland Lake mark-recapture, silver eel migration monitoring and biological sampling.

Petite Riviere Watershed Project. Water quality monitoring, habitat assessments, and fish habitat restoration work.

Morton Centre Environmental Education Programs. Environmental themed summer day camps for local youth at the 99-acre Morton Center property on Heckman's Island.

Living Shorelines and Community Green Spaces. Trail and green space development in Bridgewater, Coastal Policy development (public surveys and consultation) for Municipality of the District of Lunenburg.

Environmental Home Assessment Program. Educational home assessments of water and wastewater systems, septic pumping rebate, environmental information and tools.

LaHave River Watershed Project Partner Highlight: Nova Scotia Salmon Association's Adopt-a-Stream Program

The NSLC Adopt-a-Stream Program is a community-based watershed stewardship program offered by the Nova Scotia Salmon Association (NSSA). This excellent program provides funding and technical support for community groups to conduct restoration projects in aquatic and riparian habitats throughout Nova Scotia. The restoration projects carried out in the LaHave River Watershed in 2014 would not have been possible without the generous support and expertise of Adopt-a-Stream's professional habitat biologists.

For more information on the NSSA's Adopt-a-Stream Program and the community-based watershed projects that they support in Nova Scotia, visit ***www.adoptastream.ca***.

LaHave River Watershed Project 2014 Partners

Nova Scotia Salmon Association's NSLC Adopt-a-Stream Program • LaHave River Salmon Association • Town of Bridgewater • Municipality of the District of Lunenburg • Atlantic Salmon Conservation Foundation • Environment Canada • Environment Canada's Atlantic Ecosystem Initiative • Fisheries and Oceans Canada's Recreational Fisheries Conservation Partnership Program • CURA H20 • Clean Foundation - Nova Scotia Youth Conservation Corps • Nova Scotia Department of Natural Resources • Nova Scotia Department of Agriculture