



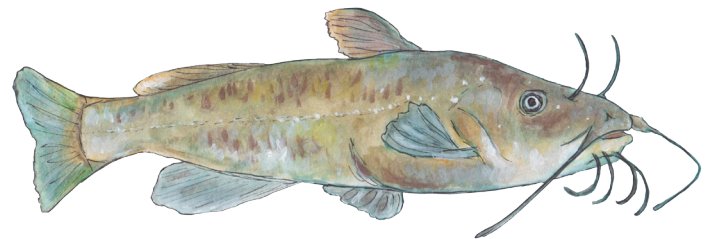
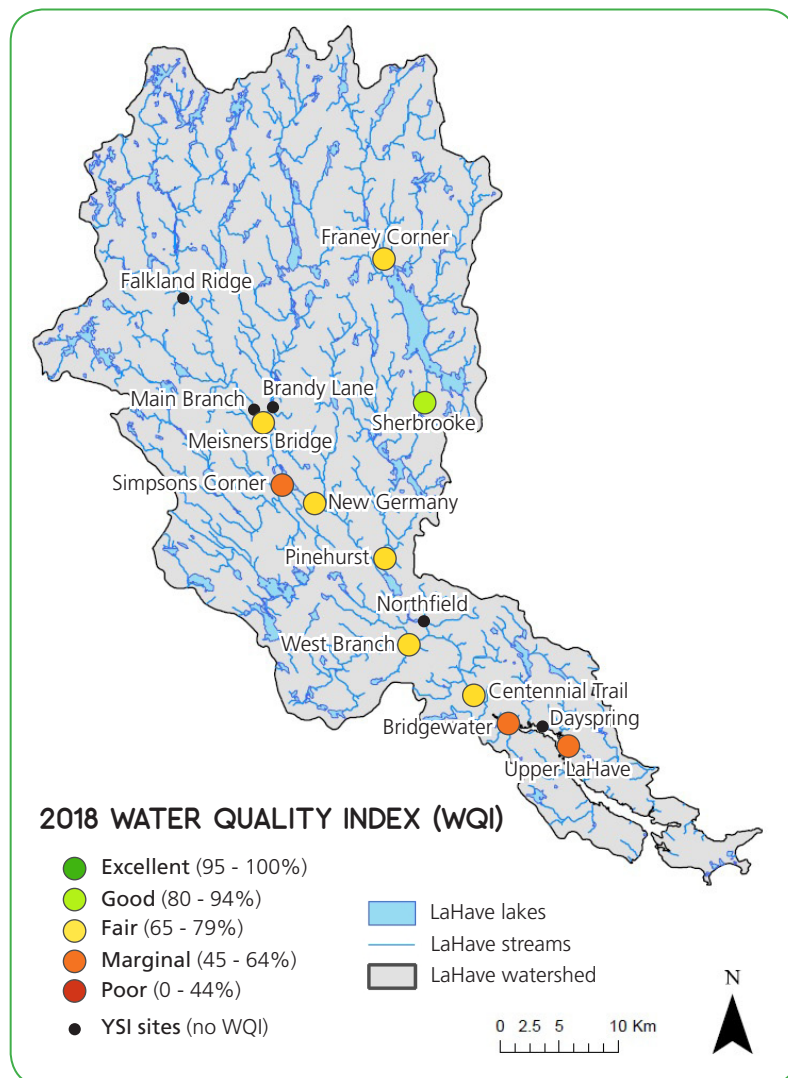
# LAHAVE 2018 WATER QUALITY REPORT CARD

The LaHave River watershed is one of the largest watersheds in Southwestern Nova Scotia – covering 1,700 km<sup>2</sup>! It covers Lunenburg County and extends into both Annapolis and Kings Counties. The watershed is used for recreation, agriculture, silviculture, and forestry, as well as rural and urban development. These land-use activities affect the LaHave River watershed's water quality and overall health.

To ensure the health of the entire watershed, Coastal Action designed and implemented a watershed-scale monitoring program for the LaHave River. Each month Coastal Action monitors the chemical, physical, and biological aspects of the water at 15 sites

across the watershed by collecting water samples and using a water quality measurement instrument (YSI Professional Plus water meter).

Now in its 13<sup>th</sup> year, the LaHave River Water Quality Monitoring Program has gained valuable knowledge on the natural variability within the watershed, in addition to a deeper understanding of the environmental impacts that human activities can have on the system.



**Brown Bullhead**  
*Ameiurus nebulosus*

## LAHAVE RIVER WATERSHED PROJECT

Coastal Action 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. 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.

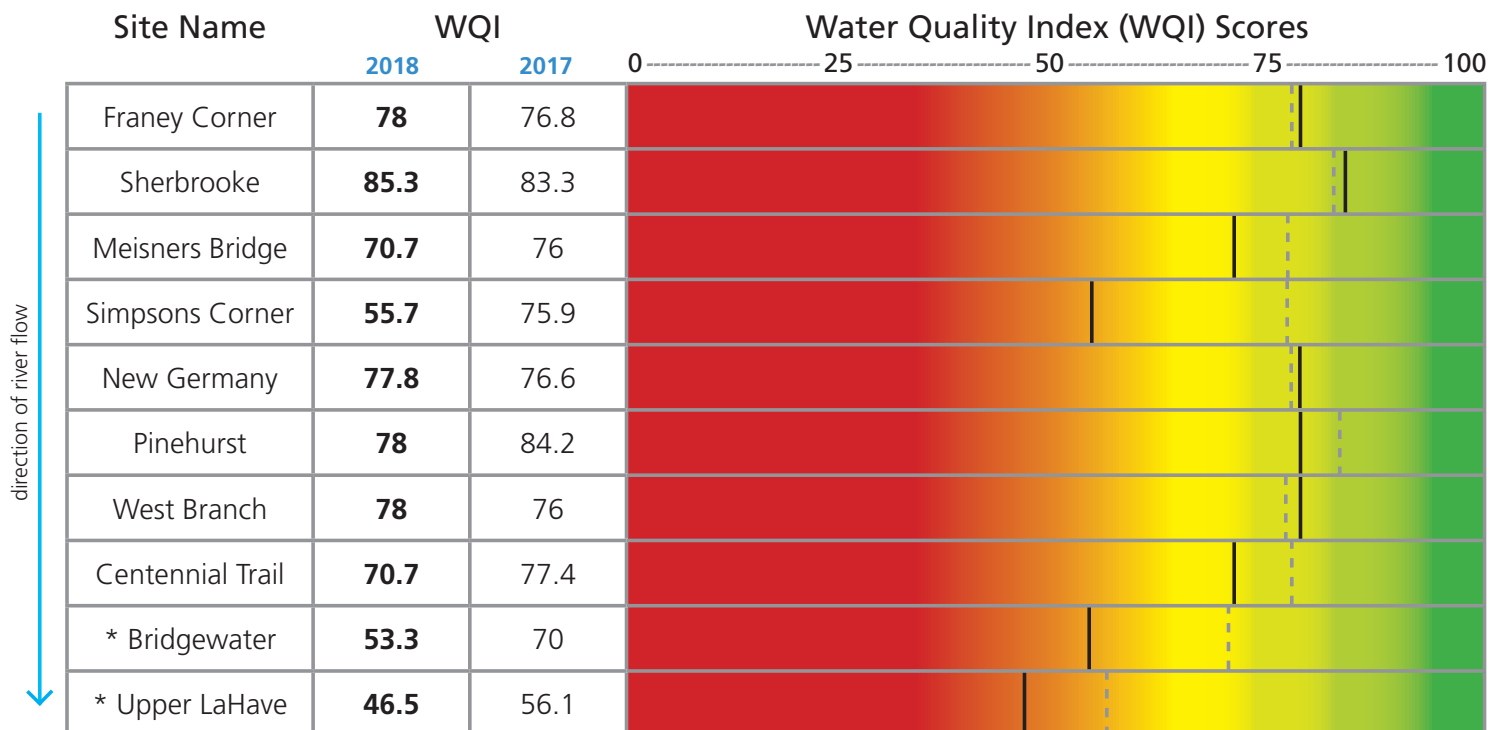
## WATER QUALITY INDEX

The Water Quality Index (WQI) is a rating used to assess the health of waterbodies. The WQI is calculated using the Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines and incorporates several parameters. The index is calculated based on the number of parameters that do not meet CCME Water Quality Guidelines, the number of times each parameter fails to meet guidelines, and the amount by which the guidelines are exceeded. To account for the complex differences between estuaries and freshwaters, different parameters are used to calculate the WQI for freshwater sites versus marine and estuary sites.

### 2018 WATER QUALITY INDEX RESULTS

**GOOD NEWS!** Four freshwater sites have improved water quality since 2017! Franey Corner, New Germany, Sherbrooke, and Simpsons Corner all had increases in their WQI values. **No freshwater site** failed their water quality thresholds for dissolved oxygen and nitrogen, and **no estuary site** failed their nitrogen threshold. In addition, there were fewer exceedances in acidity and water temperature thresholds compared to 2017, with only two months having water temperature exceedances above 20°C, and two sites (compared to seven in 2017) with four or more months of acidity breaching its 5.3-pH threshold.

**BAD NEWS!** Four freshwater sites and two estuary sites have lower WQI scores compared to 2017. Acidity and metals appear to be problems persisting throughout the LaHave River watershed. Iron concentrations exceeded the 300 µg/L threshold in freshwater sites half the time for six of the eight freshwater sites, and for half the time at both estuary sites (*Note that only two samples of iron were collected per site in 2017, so "half the time" means one of the two samples were above 300 µg/L*). In addition, four sites – Simpsons Corner, New Germany, Bridgewater, and Upper LaHave – had four or more months with water acidity greater than the 5.3-pH recommended for freshwater in the region and 7.0-pH for saltwater. Fecal enterococci at the two estuary sites is also a problem, exceeding Health Canada's recreational guideline for primary contact (70 CFU/100 mL) for seven of 12 months for Bridgewater and five of 12 months for Upper LaHave.



#### Parameters Used to Calculate WQI:

- Total Suspended Solids (TSS)
- Fecal Enterococci (marine)
- pH
- Dissolved Oxygen (DO)
- Total Iron
- Total Phosphorus
- Fecal Coliform (freshwater)
- Total Nitrate
- Water Temperature

— = 2018    - - - = 2017

## TAKE CHARGE OF YOUR WATERS!

*Good water quality is crucial to helping aquatic life survive, here's how:*

**WATER TEMPERATURES** above 20°C can cause stress to cold-water fish – like salmon and trout. Keeping the water cool helps fish keep their 'cool'. Shade from shoreline vegetation, rocks, and logs all help to maintain cooler temperatures.

**DISSOLVED OXYGEN (DO)** is necessary for aquatic life, just as we need it to breathe. DO concentrations below 6.5 mg/L can negatively affect fish, with prolonged exposure leading to fish kills. Deeper pools and stream sections with riffles help to oxygenate the water and provide fish with a good place to catch their breath!

**NUTRIENTS** are essential for healthy ecosystems; however, excessive nutrient loading leads to negative environmental impacts. As nitrogen and phosphorus are minimal in the natural environment, inputs from manure, feces, fertilizer, and garden and lawn run-off can increase nutrient concentrations and result in overgrowth of plants and algae – even leading to algal blooms.

**FECAL COLIFORM & ENTEROCOCCI** are bacteria found in the intestines of warm-blooded organisms. The presence of these indicator bacteria species signifies that the water is contaminated with feces and has the potential to make people sick. Although bacteria sources can be natural, it's still important to do your part to reduce bacteria inputs by maintaining septic systems and picking up pet waste.

## TAKE CHARGE OF YOUR ENVIRONMENT!

*Limit your footprint with these at-home tips:*



### MANURE

Line manure piles to avoid bacteria and nutrients leaching into adjacent waterways.

### PET WASTE

Put pet waste in its place: the garbage bin.

### LIVESTOCK

Keep livestock out of the water with fences (provide livestock with alternate sources of drinking water).

### LAWN

Leave a section un-mowed between your lawn and the water (called a *riparian zone*) to filter water and reduce flooding.



### FERTILIZER

Don't fertilize your lawn before a storm, as all that fertilizer will be washed into nearby waterways.

### DISH SOAP

Avoid using dish soaps with phosphates, especially when camping, as the nutrients can cause harmful algal blooms in the water.

### STRAIGHT PIPES

Replace illegal straight pipes with septic systems and keep your systems properly maintained.

## PROJECT PARTNER HIGHLIGHT: TOWN OF BRIDGEWATER



The Town of Bridgewater has been an important partner in the success of Coastal Action's water quality work in the LaHave River watershed. Aside from helping citizens become water-wise and fish-friendly through Coastal Action's LaHave River watershed projects, the Town also focuses on other programs to support its citizens. Most recently, the Town won the Smart Cities Challenge, where the winnings will go towards reducing energy poverty throughout Bridgewater.



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 environment through research, education, and action. Coastal Action has 25 years of experience in the conservation field, including: creating, engaging, and managing environmental monitoring projects; public education; species at risk projects; habitat restoration; and community and sustainability initiatives throughout the South Shore region of Nova Scotia.

### COASTAL ACTION 2018 PROJECT HIGHLIGHTS

**AMERICAN EEL AND ELVER ABUNDANCE STUDY:** Silver eel (*Anguilla rostrata*) migrations are monitored and biologically sampled at East River, Chester, and Oakland Stream. Elver abundances are being studied at East River, Chester.

**ATLANTIC WHITEFISH RECOVERY PROJECT:** Monitoring of the Hebb Dam fishway, Hebb Lake water quality monitoring, invasive species mitigation measures, and monitoring of the last population of Atlantic whitefish (*Coregonus huntsmani*) on Earth continue to be carried out by Coastal Action.

**WETLAND MONITORING AND REMEDIATION:** Wetland Ecosystem Services Protocol (WESP) surveys are being completed in the Petite Rivière watershed to gauge the health of wetlands in the region. These surveys will help us assess how well our wetlands are working and where restoration efforts may be needed.

**FISH HABITAT RESTORATION:** Aquatic connectivity is being assessed and remediated throughout the LaHave River watershed by restoring fish passage through barrier culverts where deemed appropriate.

**COMMUNITY GREEN SPACES:** Low Impact Development (LID) installations are helping promote environmentally conscious living at home and in the community by incorporating rain gardens, rain barrels, and bioswales. Not only do these structures look beautiful, but they help filter water and combat storm-related flooding.

**MORTON CENTRE ENVIRONMENTAL EDUCATION PROGRAMS:** Environmental summer day camps are held for local youth at the 99-acre Morton Centre property on Heckman's Island, as well as school-based programs.

### LAHAVE RIVER WATERSHED PROJECT 2018 PARTNERS

Atlantic Salmon Conservation Foundation • Clean Foundation - Clean Leadership Grants • Nova Scotia Salmon Association's NSLC Adopt-A-Stream Program • NS Labour and Advanced Education's Student Summer Skills Incentive Program • Environment and Climate Change Canada • LaHave River Watershed Advisory Committee