



75 YEARS OF IMPROVING

# WATERquality



Water quality testing

www.grandriver.ca

## The PAST



Water quality in the Grand River watershed was very poor 75 years ago. Changes on land, such as removing forests and draining wetlands, degraded water. So did the untreated

*In the past, outhouses were sometimes perched right on the edge of the river, as this photo near Goldie Mill in Guelph shows. The outhouse is in the right bottom. Photo courtesy of Guelph Museums.*

sewage that went directly into the waterways. At certain times of the year, there was more sewage being dumped in the river than water flowing in it.

By 1966 the province began to regulate wastewater treatment. Since that time, watershed municipalities have built and upgraded 28 sewage treatment plants. This has improved discharges into the river.



City of Guelph's sewage treatment plant on the Speed River

During the 1970s, companies started to clean up their wastewater. In 1972, governments banned phosphates from laundry detergent which resulted in less phosphorus. In the 1980s and 1990s, farmers and rural land owners started to make changes to improve the runoff from their properties.

Over the years, there have been many new technologies and approaches to help reduce the amount of pollution reaching the streams and rivers.

## The PRESENT

Ours is a story of the recovery of the Grand River from years of degradation and how we are working together to keep it healthy for future generations.

### Four fishy tales

Four fish stories each reflect a different aspect of the water quality of the Grand River watershed. Fish are the key indicator for aquatic ecosystems. A diversity of aquatic life helps to improve and stabilize water quality. In fact, it would cost billions more dollars for technology to clean the water the way that natural ecosystems do.

Each of these four species of fish illustrates a different aspect of

water quality success.

### 1

#### Brown Trout (*Salmo trutta*)

##### ● Temperature

- Brown trout need cold, clear water to thrive.
- They thrive in the 28 km stretch of river below the **Shand Dam**, called the tailwater.
- The reservoir's outflow is cold and this creates ideal conditions for the Brown trout to survive.



#### Smallmouth Bass (*Micropterus dolomieu*)

##### ● Nutrients

- Smallmouth bass thrive in cool and warm waters with good water quality.
- In 1966, no bass lived between Elora and Brantford due to poor water quality.
- It takes about 20 years for a bass to grow to 20 inches long. Bass this size are now often caught (and released) at the bass derbies held each summer along the Grand River.
- Improved **sewage treatment** and land management have reduced nutrients in rivers, bringing Smallmouth bass back.



*By 1998, the Grand became Ontario's first watershed to have a fisheries management plan, thanks to a partnership of community and angling organizations. This has led to improved fishing and river access.*

*In May 2009, the committee received the Recreational Fisheries Award from the federal Minister of Fisheries and Oceans for all their hard work, which continues today.*



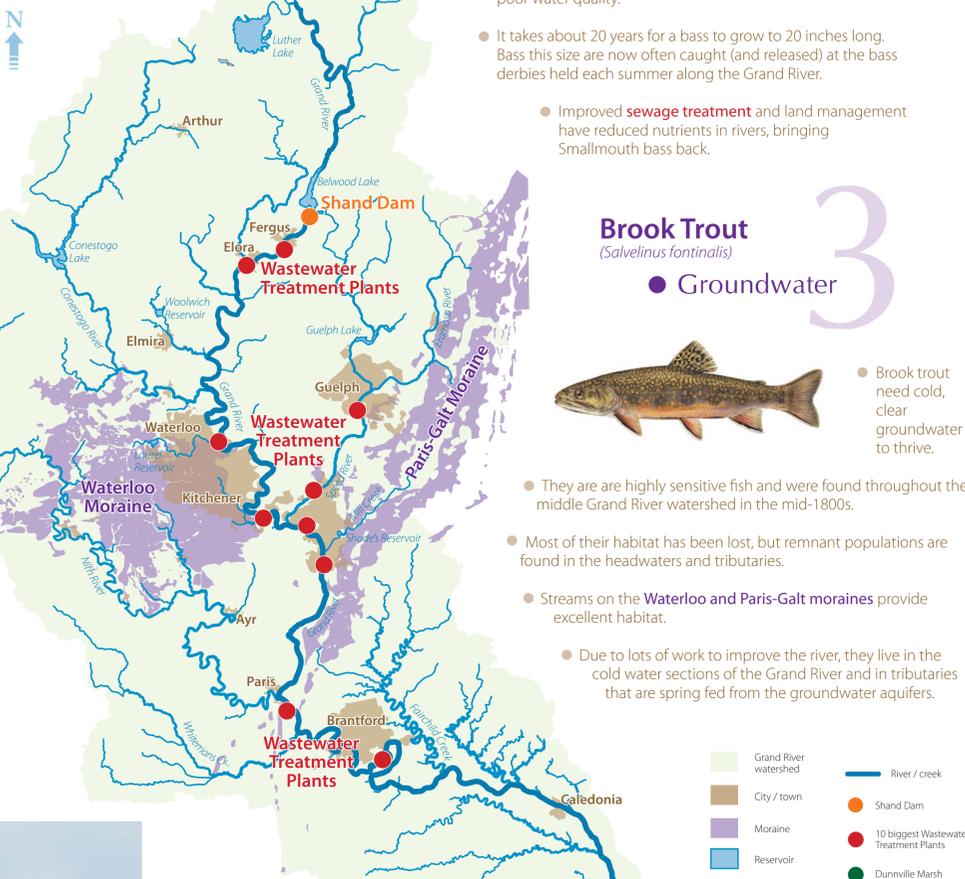
The Recreational Fisheries Award medalion

Photo from The Record's blog 'A Year on the Grand'. Used with permission.

### Nutrients: too much of a good thing

Nutrients are organic and include phosphorus and nitrogen and are essential building blocks in an aquatic system. They are food for plants and aquatic animals. They are carried into the river with agricultural runoff and wastewater effluent. But high nutrient levels lead to excessive aquatic plants and low dissolved oxygen, making it hard for aquatic organisms to survive.

This turtle is surrounded by algae.



#### Brook Trout (*Salvelinus fontinalis*)

##### ● Groundwater

- Brook trout need cold, clear groundwater to thrive.
- They are highly sensitive fish and were found throughout the middle Grand River watershed in the mid-1800s.
- Most of their habitat has been lost, but remnant populations are found in the headwaters and tributaries.
- Streams on the **Waterloo and Paris-Galt moraines** provide excellent habitat.
- Due to lots of work to improve the river, they live in the cold water sections of the Grand River and in tributaries that are spring fed from the groundwater aquifers.



#### Walleye (*Stizostedion vitreum*)

##### ● Lake Erie & wetlands

- Walleye are an adaptable cool-water fish that thrive in low light conditions.
- They spawn in the southern Grand River. Once the eggs hatch, the current pushes the tiny fish into the calm waters of the **Dunnville Marsh**. This wetland has lots of food and acts as a "fish nursery".
- Walleye move between the wetlands, the southern Grand River and **Lake Erie** based on their age and the season.

Fish images provided with permission from the MNR.

## The FUTURE

Population growth and climate change are the biggest challenges to water quality. As more people and businesses move into the area, more water is used and more wastewater is generated. Conserving water means less wastewater flows into our waterways. Climate change means more intense local rainstorms with lots of runoff. Green infrastructure such as wetlands and vegetation along streams keep water on the landscape instead of inundating and overwhelming creeks and rivers.



### Wetlands - WOW!

Wetlands, such as Luther Marsh and Dunnville Marsh, are a precious resource. They improve water quality because they trap sediment, nutrients and contaminants.

They also act as sponges and absorb much of the water runoff from the land so it can be released slowly. This helps to reduce flooding and to sustain water flow in our creeks and rivers during dry spells.

Wetlands also offer shelter to a great number of species and have the highest level of biodiversity of any habitat.