

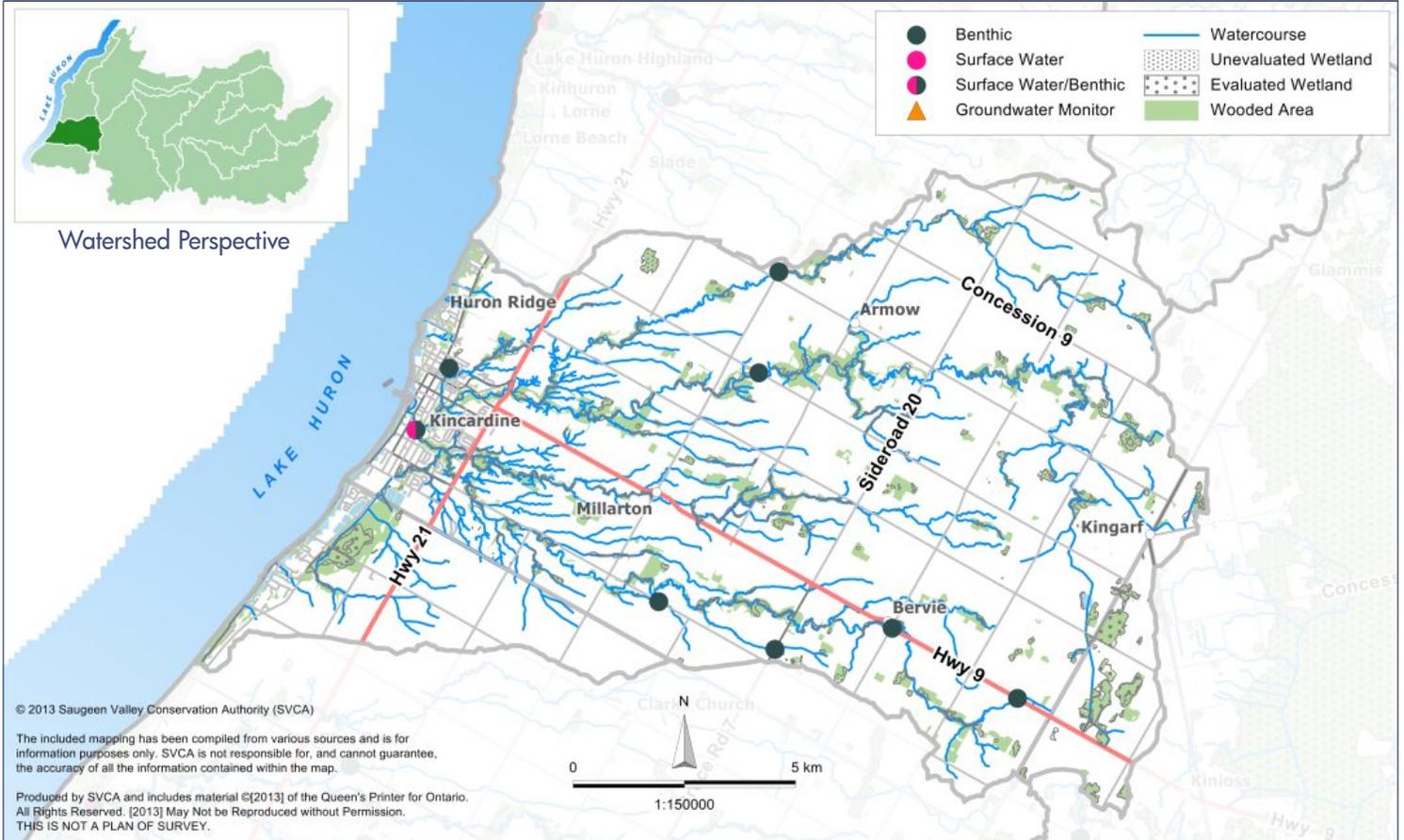


2007-2011

Penetangore River Watershed REPORT CARD

A report on the general condition of the Penetangore River Watershed

2013



AVERAGE GRADES

- D** Forest Conditions
- D** Wetland Conditions
- C** Surface Water Quality
- N/A** Groundwater Quality

The Penetangore River consists of two major tributaries, the North and Main Penetangore, as well as two intermediate tributaries, referred to as Millarton and Kincardine Creeks. The system drains 192 square kilometers, falling 12.5 metres in 51.2 kilometres, thus having an average gradient of 2.2 metres per kilometer. The water within the network of streams drains into Lake Huron at Kincardine. This watershed is predominantly agricultural (83%). The Town of Kincardine and smaller communities such as Bervie and Millarton also exist here.

The basin for this river system crosses two physiographic regions: the Huron Slope and the Huron Fringe. The Huron Slope is predominantly clay plain with the twin beaches of glacial Lake Warren and the Wyoming Moraine. The Huron Fringe is characterized by the wave cut terraces of Glacial Lake Algonquin and consists of boulders, gravel bars and sand dunes. The topography of the Penetangore River watershed is generally smooth with gentle sloping areas except where the watercourse has cut deep valleys into the clay loam soils.

Forest Conditions

The Penetangore River Watershed falls short of meeting the Environment Canada guidelines of 30% forest cover scoring an *average* grade of 'D'. Forest cover and forest interior grades did not change with a 'D' and an 'F', respectively. There are a limited number of small, fragmented forests, many of which exist along the banks of streams. Riparian forested cover scored a 'C' grade. The recommendation is that 50% of the 30 metre wide riparian zone have forest cover. The Penetangore River Watershed has only 31.6% of the riparian zone forested.

Tree planting along riparian zones and on marginal farmland should be considered to ensure the forest conditions are improved and any existing forests should be protected. From 2007-2011 there were 46,950 trees planted in this watershed through the Grey Bruce Forestry Service.

Wetland Conditions

This report card summarizes the conditions of both 'evaluated' and 'unevaluated' wetlands. Since the last set of report cards summarized only the 'evaluated' wetlands the present results cannot be compared to the previous report card results. When considering the presence of all wetlands, the Penetangore River Watershed scores a 'D' grade with 4.0% wetland cover in the watershed. This is below the Environment Canada recommendation of 10% as the minimum required for a healthy watershed. Almost all of the wetlands are gone due to the high concentration of agricultural land. It would be advisable to allow low lying or wet areas to naturalize. These are key areas and allowing them to regenerate will help to improve the health of the watershed. It is also important to restore previously drained wetlands where possible and any existing wetlands should be protected.



Surface Water Quality

The Penetangore River scores an *average* grade of 'C' for surface water quality. The *average* total phosphorus concentration is above the provincial water quality objective of 0.03 mg/L. *E. coli* is below the recreational guidelines of 100 CFU/100mL but counts do increase considerably after storm events. The grade for *E. coli* improved since the last report card going from 'D' to 'C'. The phosphorus grade has stayed the same and should to be reduced.

The benthic invertebrate grade went down from a 'C' to a 'D'. Changes in the benthic invertebrate community are seen as early indicators of deterioration in water quality that might not be seen in the chemistry results. A 'D' grade indicates poor ecosystem quality. Landowners should be encouraged to preserve and improve natural land cover where possible. Current stressors such as climate change and invasive species could pose significant threats in this watershed, therefore, efforts should be made to address these stressors to maintain or improve the current scores.

Groundwater Quality

There are no monitoring wells located within this watershed, however, it should be noted that groundwater aquifers do not conform to watershed boundaries but rather flow in an east to west direction through the watershed. Other monitoring wells in the area have excellent water quality. Different types of aquifers exist throughout the region and the quality of individual wells on private property may vary from that of the provincial monitoring wells.

GRADE DESCRIPTION

- A** = Excellent ecosystem conditions. Some protection and enhancement may be required.
- B** = Good ecosystem conditions. Some areas may require enhancement and/or improvements.
- C** = Ecosystem conditions that warrant general improvements.
- D** = Poor ecosystem conditions. Overall improvements necessary.
- F** = Degraded ecosystem. Conditions in need of considerable improvement.

Penetangore River Watershed

| | Indicators | 2002-2006 % of AREA | 2007-2011 % of AREA | 2007-2011 Grade | Trend * | Indicator Description |
|--------------------|-----------------|------------------------|------------------------|--------------------|------------|---|
| Forest Conditions | Forest Cover | 11.3 | 10.8 | D | ↔ | Forest cover is the percentage of the watershed that is forested or wooded. <i>Environment Canada suggests that 30% forest cover is the minimum needed to support healthy wildlife habitat.</i> |
| | Forest Interior | 1.3 | 1.0 | F | ↔ | Forest interior refers to the protected core area found inside a woodlot. It is the sheltered, secluded environment away from forest edges and open habitats. <i>Environment Canada recommends that a minimum of 10% of a watershed should be interior forest cover to sustain plant and animal species.</i> |
| | Riparian Cover | ** | 31.6 | C | | Riparian Cover is the percentage of forested habitat along a given waterway. <i>Environment Canada guidelines suggest that at least 75% of stream length should have 30 metre naturally vegetated buffers. Forested vegetation represents about two-thirds with the rest being marsh, meadow, and shrub thicket. The equivalent target is 50% of the riparian zone in forest cover.</i> |
| | Average Grade | D | D | | ↔ | Grade D indicates poor ecosystem conditions and overall improvements are necessary. |
| Wetland Conditions | Wetland Cover | ** | 4.0 | D | | Wetland cover is the percentage of existing wetland in a watershed. <i>Environment Canada suggests that 10% wetland cover is the minimum needed for a healthy watershed.</i> |
| | Average Grade | - | D | | | Grade D indicates poor ecosystem conditions and overall improvements are necessary. |

| | Indicators | 2002-2006 Result | 2007-2011 Result | 2007-2011 Grade | Trend * | Indicator Description |
|-----------------------|-----------------------|-------------------------|------------------------|--------------------|------------|--|
| Surface Water Quality | Benthic Invertebrates | 5.64 | 5.97 | D | ↓ | Benthos or benthic macroinvertebrates are large bottom dwelling insects, crustaceans, worms, mollusks, and related aquatic animals that live in watercourses. They are good indicators of water quality, responding quickly to environmental stressors such as pollutants. <i>The Modified Family Biotic Index (FBI) using New York State tolerance values provide stream health information and values range from 1 (healthy) to 10 (degraded).</i> |
| | Total Phosphorus | 0.033 (mg/L) | 0.034 (mg/L) | C | ↔ | Total phosphorus is indicative of nutrient levels within a watercourse. Phosphorus is required for the growth of aquatic plants and algae, however, concentrations above the Provincial Water Quality Objective may result in unhealthy stream conditions. <i>The Provincial Water Quality Objective is 0.03 mg/L.</i> |
| | <i>E. coli</i> | 148 (CFU/ 100 mL) | 81 (CFU/ 100 mL) | B | ↑ | <i>E. coli</i> originate from the wastes of warm blooded animal, including humans, livestock, wildlife, pets and waterfowl. <i>The Ontario Recreational Water Quality Guidelines suggest that waters with less than 100 CFUs/100mL are safe for swimming.</i> |
| | Average Grade | C | C | | ↔ | Grade C indicates ecosystem conditions that need to be enhanced. |
| Groundwater Quality | Nitrite + Nitrate | N/A | N/A | N/A | | Nitrates are present in water as a result of decay of plant or animal material, the use of fertilizers, domestic sewage or treated wastewater, as well as geological formations containing soluble nitrogen compounds. <i>The Ontario Drinking Water Standard for nitrite + nitrate is 10 mg/L.</i> |
| | Chloride | N/A | N/A | N/A | | While chloride can be naturally occurring, the presence of elevated chloride may indicate contamination from road salt, industrial discharges, or landfill leachate. <i>The Ontario Drinking Water Standard for chloride is only for aesthetic purposes with an objective of 250 mg/L.</i> |
| | Average Grade | N/A | N/A | | | There are no monitoring wells located within this watershed, however, other monitoring wells in the vicinity have good water quality achieving an A grade. |

* For the 2007-2011 report cards the grading system has changed. To be able to compare the results, the scores from the 2002-2006 report cards were included. The new grading system was applied to these former scores and it was then determined whether the grades have stayed the same ↔, improved ↑, or declined ↓.

** The data was calculated differently for the previous set of report cards so it is not possible to compare to the 2007-2011 data.

Surface water data used for this interpretation were obtained through the Provincial Water Quality Monitoring Network (PWQMN), the Ontario Benthos Biomonitoring Network (OBBN) and Saugeen Conservation's Water Quality Monitoring Network.

Groundwater data A general determination of water quality in the area can be made by looking at other wells in the vicinity.

Penetangore River Watershed General Information

| | | |
|--|--|---|
| Area 192 sq. km | Dams There are no dams in the watershed | Groundwater Aquifer Sources Detroit River Group; Onondage Formation |
| Municipalities Municipality of Kincardine, Township of Huron-Kinloss, Municipality of Brockton | Sewage Treatment Facilities Kincardine | Stream Flow (mean) Mean annual flow - 1.63 cubic metres per second (cms) |
| Physiography 43% till plain (undrumlined), 27% till plain (bevelled), 15% sand plain, 9% till moraine, 5% beaches and shorecliffs | Woodlot Size Limited forest cover along the lakeshore and at the back of farm lots | Stream Flow (low) * 7Q10 flow ¹ - 0.1 cms 7Q20 flow ² - less than 20 years of data |
| Soils 61% clay loam, 18% fine to moderately coarse sandy loam, 10% silty loam, 9% other (may include small percentages of alluvium, breypan, bottomlands etc), 2% organic material | Land Use 83% agriculture; 11% forested; 3.9% urban | Rare Species (obtained from the National Heritage Information Centre (NHIC) Website) Clamp-tipped Emerald, Beaked Spike-rush, Great Lakes Sand Reed, Great Lakes Wild Rye |
| | Areas of Natural and Scientific Interest (ANSI) - none | |

* ¹ 7Q10 - the lowest mean flow for seven consecutive days that has a 10-year recurrence interval period, or a 1 in 10 chance of occurring in any one year.

² 7Q20 - the lowest mean flow for seven consecutive days that has a 20-year recurrence interval period, or a 1 in 20 chance of occurring in any one year.

Environmental Initiatives from 2007-2011

- **Saugeen Conservation** through its various programs continually monitors watershed and subwatershed conditions. From 2007 to 2011 conservation efforts included water quality monitoring and the planting of **46,950** trees.
- Environmental self assessments are available for the rural non-farm and coastal landowners using The **Rural Landowner Stewardship Guide** for the Lake Huron Watershed and A Stewardship Guide for the Lake Huron Coastline. These guides allow landowners to evaluate their property and its management. See the website www.theguide.huronstewardship.on.ca to find out how to obtain a guide.
- The **Lake Huron Fishing Club** operates a hatchery in Kincardine rearing young fish to augment the fishery in local rivers. For more information see www.lakehuronfishingclub.com
- The **Bruce Resource Stewardship Network** offered seed money, labour, and technical support for landowners in the watershed who were interested in completing habitat enhancement projects. Projects were typically focused on water quality improvement.
- The **Lake Huron Centre for Coastal Conservation (LHCCC)** provides expertise relating to shoreline issues. They specialize in technical advice and literature, regular mail-outs, hands-on programs, conferences, presentations and materials on shoreline programs and services. They can be reached at www.lakehuron.on.ca
- The **Penetangore Watershed Group** was recently established with a goal of improving water quality in this watershed. Tree planting and cattle exclusion fencing have been completed to date.



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For more information about the report card process, indicators and how grades were calculated, please refer to the **Background** document.

Alternative formats of this report are available upon request.