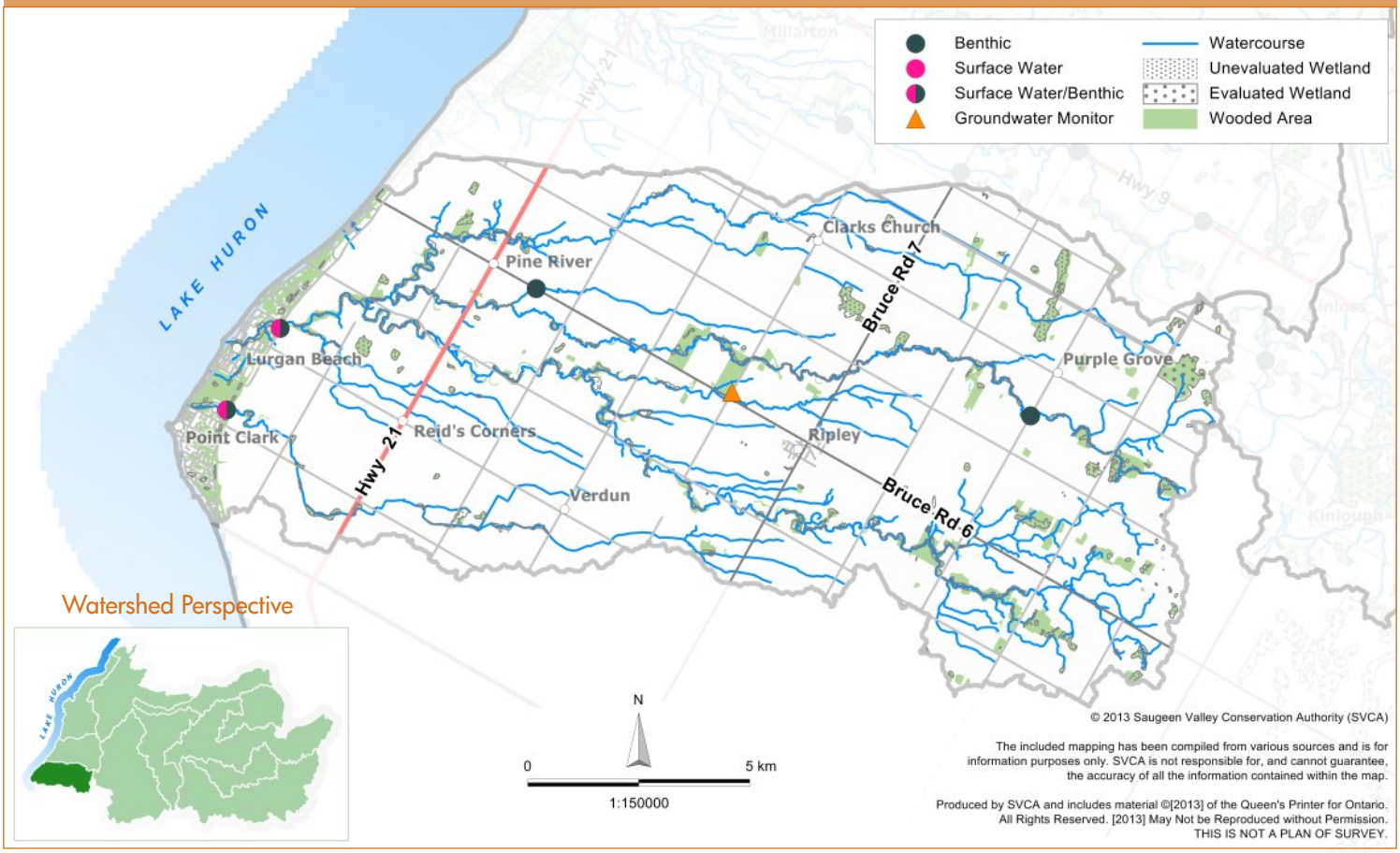
SAUGEEN CONSERVATION

2007-2011 Pine River Watershed REPORT CARD

A report on the general condition of the Pine River Watershed 2013



AVERAGE GRADES

D	Forest Conditions
D	Wetland Conditions
C	Surface Water Quality
A	Groundwater Quality

The Pine River is situated in the southern part of Bruce County in the Municipality of Huron-Kinloss. Generally the Pine River flows from east to west, through mainly agricultural soils east of the Glacial Lake Algonquin Shoreline into a seasonal and permanent residential area along the Lake Huron Shoreline. Tributaries include Royal Oak Creek, the South Pine River. Clark Creek is also included in this watershed.

The soils in the watershed are composed of till materials that are very productive for agriculture purposes. There are sandy deposits associated with glacial shorelines. As a result of the productive soils, much of the land has been cleared of wetlands and forests. The remaining woodlots are largely fragmented and typically associated with the river valleys.

Wetlands are rare in the watershed and have been significantly impacted by drainage. The largest remaining wetland is the locally significant West Kinlough Wetland Complex, (0.6 km^2), located in the headwaters of Royal Oak Creek and the Pine River.

Forest Conditions

With an *average* grade of 'D' for forest conditions, the Pine River Watershed continues to fall short of the Environment Canada guidelines of 30% forest cover and 10% forest interior. Forest cover scored a 'D' grade and forest interior scored an 'F' grade. These are the same grades as the previous report card. The grade for riparian cover fell from a 'C' to a 'D'. The recommendation is that 50% of the 30 metre wide riparian zone should have forest cover. The Pine River Watershed has only 26% of the riparian zone forested.

Although many trees have been planted in the watershed (130,845 trees from 2007-2011) it will take years before they reach a height of 4 metres (which can be measured by mapping). Tree planting must continue to ensure the forest conditions continue to improve.

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. When considering the presence of all wetlands, the Pine River watershed scores an 'D' grade with 3.4% wetland cover.

This is below the Environment Canada recommendation of 10% as the minimum needed for a healthy watershed. 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 wetland scores. Care should be taken to protect existing wetlands.

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.

Surface Water Quality

The Pine River scores an *average* grade of 'C' for surface water quality. Overall the grade has improved from a 'D' to a 'C' since the last report card.

The *average* total phosphorus concentration remains above the provincial water quality objective of 0.03 mg/L. The *average E. coli* is also above the recreational guidelines of 100 CFU/100mL and counts do increase considerably after storm events. With these concentrations the river would be considered unsafe for swimming. The grades for phosphorus and *E. coli* improved since the last report card going from 'D' to 'C', however, the levels still need to be reduced.

The benthic invertebrate grade went down from a 'B' to a 'C'. 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. Efforts must continue in encouraging landowners and the agricultural community to preserve and improve natural land cover. 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

This well monitors two overburden aquifers. Only the lower aquifer is sampled for chemistry. The groundwater quality (based on data from this one monitoring well) is excellent. 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. 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 in this report. There have been no exceedences of the Ontario Drinking Water Standards during this study period.

Pine River Watershed

	Indicators	2002-2006 % of AREA	2007-2011 % of AREA	2007-2011 Grade	Trend *	Indicator Description
Forest Conditions	Forest Cover	7.8	**7.8**	**D**	⇔	Forest cover is the percentage of the watershed that is forested or wooded. ***Environment Canada suggests that 30% forest cover is the minimum needed to support healthy wildlife habitat.***
	Forest Interior	0.8	**0.7**	**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. ***Environment Canada recommends that a minimum of 10% of a watershed should be interior forest cover to sustain plant and animal species.***
	Riparian Cover	**	**26**	**D**		Riparian Cover is the percentage of forested habitat along a given waterway. ***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.***
	Average Grade	D	**D**		⇔	Grade D indicates poor ecosystem conditions and overall improvements are necessary.
Wetland Conditions	Wetland Cover	**	**3.4**	**D**		Wetland cover is the percentage of existing wetland in a watershed. ***Environment Canada suggests that 10% wetland cover is the minimum needed for a healthy watershed.***
	Average Grade	-	**D**			Grade D indicates poor ecosystem conditions and overall improvements are necessary.

	Indicators	2002-2006 Result	2007-2011 Result	Grade	Trend *	Indicator Description
Surface Water Quality	Benthic Invertebrates	4.99	**5.41**	**C**	⇓	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. ***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).***
	Total Phosphorus	0.065 (mg/L)	**0.041 (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. ***The Provincial Water Quality Objective is 0.03 mg/L.***
	E. coli	718 (CFU/ 100 mL)	**121 (CFU/ 100 mL)**	**C**	⇑	*E. coli* originate from the wastes of warm blooded animal, including humans, livestock, wildlife, pets and waterfowl. ***The Ontario Recreational Water Quality Guidelines suggest that waters with less than 100 CFUs/100mL are safe for swimming.***
	Average Grade	D	**C**		⇑	Grade C indicates ecosystem conditions that need to be enhanced.
Groundwater Quality	Nitrite + Nitrate	0.13 (mg/L)	**1.04 (mg/L)**	**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. ***The Ontario Drinking Water Standard for nitrite + nitrate is 10 mg/L.***
	Chloride	7.1 (mg/L)	**10.8 (mg/L)**	**A**	***	While chloride can be naturally occurring, the presence of elevated chloride may indicate contamination from road salt, industrial discharges, or landfill leachate. ***The Ontario Drinking Water Standard for chloride is only for aesthetic purposes with an objective of 250 mg/L.***
	Average Grade	A	**A**		***	Grade A indicates excellent ecosystem conditions and protection may be required. Some areas may require enhancement to maintain this level of quality.

* 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.

*** Insufficient data to establish trends.

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 used for this interpretation were obtained through the Provincial Groundwater Monitoring Network (PGMN). 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.

Pine River Watershed General Information

Area
195 sq. km

Municipalities
Township of Huron-Kinloss, Municipality of Kincardine

Physiography
56% till plain (bevelled), 19% till plain (undrumlinized), 15% sand plain, 6% till moraine, 3% beaches and shorecliffs

Soils
69% clay loam, 12% fine to moderately coarse sandy loam, 7% other (may include small percentages of alluvium, breypan, bottomlands etc), 7% silty loam, 2% coarse sandy loam and loamy sand, 1% medium to moderately fine loam, and 1% organic material

Dams
None on the Pine River and one small dam (1.7 metres in height) on Clark Creek

Sewage Treatment Facilities
Ripley

Woodlot Size
Small woodlots limited to the back of farm lots or around watercourses with the exception of the Huron fringe area

Land Use
89% agriculture; 7.8% forested; 1.6% urban

Areas of Natural and Scientific Interest (ANSI) - none

Groundwater Aquifer Sources
Detroit River Group; Onondage Formation

Stream Flow (mean)
Mean annual flow - 2.62 cubic metres per second (cms)

Stream Flow (low) *
7Q10 flow[1] - 0 cms 7Q20 flow[2] - 0 cms (dry in summer)

Rare Species (obtained from the National Heritage Information Centre (NHIC) Website)
Tulip Tree Silk Moth, Clamp-tipped Emerald, Beaked Spike-rush, Blue-leaved Willow, Great Lakes Sand Reed, Great Lakes Wild Rye

* [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** continues to work with the Pine River Watershed Improvement Network (PRWIN) to improve overall conditions in this watershed. From 2007 to 2011 there were **130,845** trees planted.
- The **Pine River Watershed Initiative Network** (PRWIN) has been implementing environmental programs since 2000, focussing on water quality improvements in both the Pine River and Clark Creek. Past projects include livestock restriction fencing and alternative watering source installation, watercourse crossing improvements, riparian reforestation, and the installation of filters in the watercourses to reduce nitrates. For more information go to www.pineriverwatershed.ca
- The **Lake Huron Centre for Coastal Conservation** (LHCCC) provides expertise relating to shoreline issues. They specialize in technical advice and literature specific to the area, regular mail-outs, education, hands-on programs, conferences, presentations and materials on shoreline programs and services. They can be reached at www.lakehuron.on.ca
- The **Municipality of Huron Kinloss** initiated a septic re-inspection program in response to water quality concerns in the local rivers and Lake Huron. The goal of the program is to inspect all septic systems in the municipality on a 7-9 year cycle. The municipality has also implemented an extensive water quality monitoring program.

SAUGEEN CONSERVATION
1078 Bruce Rd. 12, P.O. Box 150,
Formosa ON N0G 1W0
519-367-3040
www.svca.on.ca

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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.