Brown Creek
Watershed Report Card 2013

This report card summarizes surface water quality and forest condition in the Brown Creek watershed within the St. Clair Region Conservation Authority jurisdiction from 2001 to 2010. The summary is intended to provide citizens, community groups, municipalities, industries and agencies with information so they can take actions to protect or enhance the environmental features of the watershed. The ongoing monitoring will be reported on a five-year cycle which will help local people manage their local environment. This card uses the 2011 guidelines and updated grading system for Conservation Authority Watershed Report Cards. These new province-wide standards have a more stringent grading system and result in generally lower grades in the intensely developed regions of southwestern Ontario.

This report card is part of a larger report entitled the St. Clair Region Conservation Authority Watershed Report Card (2013) available at www.scrca.on.ca. Further information including methodology, comparisons with the other 13 St. Clair Region watersheds, regional maps and summary tables are also found in that document.

SURFACE WATER QUALITY

Declining **C**

Indicator	Brown Creek		St. Clair Region	Provincial Guideline	Indicator Description
	2005	2010	2010		
Total Phosphorus (mg/L)	0.09	**0.15 D Declining**	0.13 D	0.03	*Phosphorus is found in products such as detergents, fertilizer and pesticides, and contributes to excess algae and low oxygen in streams and lakes.*
Bacteria (#*E. coli*/100mL)	no data	**no data**	169 C	100 (recreational use)	*Fecal bacteria are found in human and animal (livestock/ wildlife) waste. Their presence in water indicates fecal contamination and is a strong indicator that other disease-causing organisms are in the watercourse.*
Benthic Score (FBI)	5.5	**5.5 C Steady**	5.9 D	None	*Benthic invertebrates are small animals without backbones that live in stream sediments. The Family Biotic Index (FBI) scores each taxa according to its pollution tolerance and ranges from 1 (healthy) to 10 (severely degraded).*

FOREST CONDITION

D

Indicators	Brown Creek		St. Clair Region	Indicator Description
	2005	2010	2010	
Forest Cover %	12.2	**12.6 D**	11.4 D	*Forest Cover is the percentage of a watershed that is forested. Environment Canada recommends that 30% of a watershed should be forest and other natural cover to sustain native plants and animals.*
Forest Interior %	1.9	**2.2 F**	2.0 F	*Forest Interior is the core area inside a woodlot that some bird species need to breed successfully. The outer 100 m perimeter of a woodlot is prone to high predation, sun and wind damage, and alien species invasion.*
Forested Riparian Buffer %	No data	**25.4 D**	21.2 D	*Forested Riparian Buffer is the 30 m area that is forested on both sides of an open watercourse. Natural cover in this area aids in sediment and nutrient removal.*

The changes in forest condition percentages between the two time periods may reflect more accurate mapping, rather than an actual gain or loss of forest cover.

Forest Condition

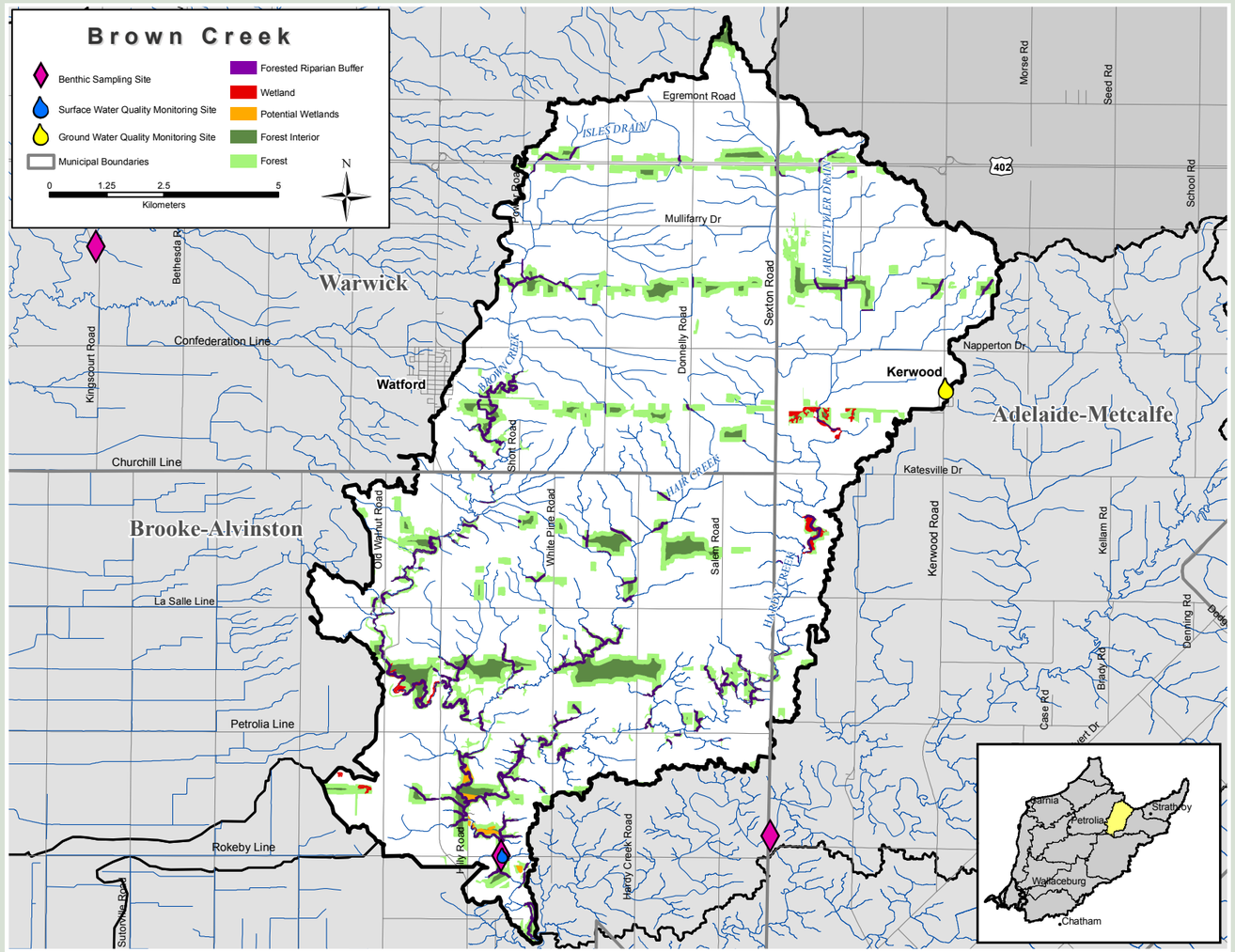
D

The three forest condition indicators score a D, F and D, producing an overall grade of D. This watershed has poor forest cover, poor riparian cover and very poor forest interior. The majority of the woodlands are less than 5 hectares in size. The percent forest cover (12.6%) is higher than average in the St. Clair Region but is still too low for sustainability and the target for southern Ontario is 30% forest cover. The percent forest interior (2.2%) is low indicating that most woodlots are too narrow to support area sensitive species such as Scarlet Tanager and Ovenbird. The target for southern Ontario is 10% forest interior. The percentage of the riparian zone that is forested (25.4%) is higher than average in the St. Clair Region, though lower than the target of 50%.

Although there have been a significant number of tree-planting projects in this watershed, forests grow very slowly, and recent reforestation efforts are not likely to be visible in aerial photography. Young trees are not considered to be forests until the trees are at least 3 m tall and a canopy is developing. Forest loss from land use changes will be visible from above.

Local Solutions to Improve Forest Condition

- Increase forest interior by "bulking up" woodlots to make them larger and rounder, to reduce the impact of extreme weather events on tree health
- Woodlot owners should prepare and follow Woodlot Management Plans
- Connect the woodlots at the back of farm properties into corridors, to improve wildlife habitat



Highlights Since 2005

- This watershed had a concentration of stewardship actions, with landowners completing 34 stewardship projects including wetland enhancement and extensive tree and shrub plantings
- Industry tested innovative planting techniques to reduce their environmental footprint, with Canada Waste Management planting 100,000 poplars for leachate treatment
- Landowners put personal time and effort into developing large healthy native forests on their properties, attending Lambton County Woodlot Owners Association events and managing their woodlots for wood fibre and species diversity

Surface Water Quality

C Declining

The surface water quality indicators that are available scored D and C producing an overall grade of C (using the provincial grading system). The score continues to be a C grade, which is better than the St. Clair Region average.

Since the previous report card levels of phosphorus have increased sharply. They have increased from three times the Ministry of the Environment (MOE) guideline, to five times the MOE guideline which increases the risk of serious algae in downstream watersheds.

Water quality based on benthic scores has been steady since 2005.

Local Solutions to Improve Water Quality

- Implement Environmental Farm Plans, particularly for fertilizer and nutrient management, to reduce nutrient loss
- Fix faulty septic systems and establish a septic maintenance plan
- Develop and maintain streamside buffers along one side of all water-courses, especially municipal drains

Impacts of Climate Change

- We can expect more severe weather: more storms with intense rainfall or snow; and more extended droughts.
- We can expect flooding conditions more often throughout the summer.
- Warmer temperatures will result in shifts in species diversity and will put pressure on species at risk.
- Less predictable weather increases the need to carry out stewardship projects and improved stormwater management to help protect watersheds.

Brown Creek
Watershed Features

Area	155 km^2, 3.8% of the St. Clair Region watershed
Municipalities	Brooke-Alvinston (69 km^2), Warwick (54 km^2), Adelaide-Metcalfe (33 km^2)
First Nations	None
Physiography	50% clay plain; 23% till moraine; 23% till plain (Undrumlinized); 3% bevelled till plain; 1% beach and shorecliff
Soil Type	64% silt and clay; 25% silt and clay loam; 5% bottom land and beach; 4% loam; 2% sand loam
Streamflow	There is no flow monitoring on Brown Creek.
Precipitation	The average annual precipitation at Strathroy from 2002-2010 is 917 mm. From 2006-2010, levels were slightly above this value, ranging from 804 to 1241 mm. The previous period, from 2002-2005, was lower, ranging from 682 to 980 mm.
Air Temperature	The average annual temperature at Strathroy is 8.6°C. From 2006 to 2010, average annual temperatures were usually above the normal, ranging from 8.1 to 9.4°C. The previous period of record, 2002-2005, experienced cooler temperatures with a range of 7.6 to 9.1°C.
Tileage	21% randomly tiled; 47% systematically tiled; 32% unknown drainage
Watercourse Length & Type	Total length: 329 km Watercourse type: 15% natural; 29% open municipal drain; 27% buried; 29% unclassified
Dams and Barriers	4 dams, all privately owned
Sewage Treatment Plants	Kerwood sewage treatment facility was developed (2010), with treatment provided in a large subsurface system incorporating a tile bed.
Fisheries Resources	13 fish species with no game fish have been recorded. No freshwater mussel species have been recorded, but more sampling is needed.
Species at Risk	Plants: Blue Ash, Green Dragon Reptiles: Eastern Spiny Softshell Turtle, Northern Map Turtle, Snapping Turtle Mammals: American Badger Birds: Bobolink, Cerulean Warbler Fish: Eastern Sand Darter
Stewardship Projects	34 stewardship projects have been completed in this watershed from 2006 to 2010, including the planting of 33,640 trees and shrubs.
Groundwater	The shallow unconfined aquifers associated with the Seaforth Moraine provide groundwater to some residents. The deeper aquifer at the interface between the overburden and the bedrock, known in Lambton as the Fresh Water Aquifer, provides some groundwater but is limited in quantity and has elevated chloride. Municipal piped water from an intake on Lake Huron is available in most of this region.
Wetland Cover	48 ha (0.3% of the watershed) are identified as wetlands by MNR. An additional 20 ha (0.1% of the watershed) are identified by SCRCA as potential wetlands.

Woodlot Size

Size Category	Number of Woodlots	% of Woodlots	Total Woodland Area (ha)	% of Total Woodland Area	Largest Woodlot (ha)
<5 ha	84	58	166	9	157
5-10 ha	22	15	157	8	
10-30 ha	22	15	410	21	
>30 ha	18	12	1,222	62	
Total	**146**		**1,956**		

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