



Surface Water Quality  
**C - Steady**

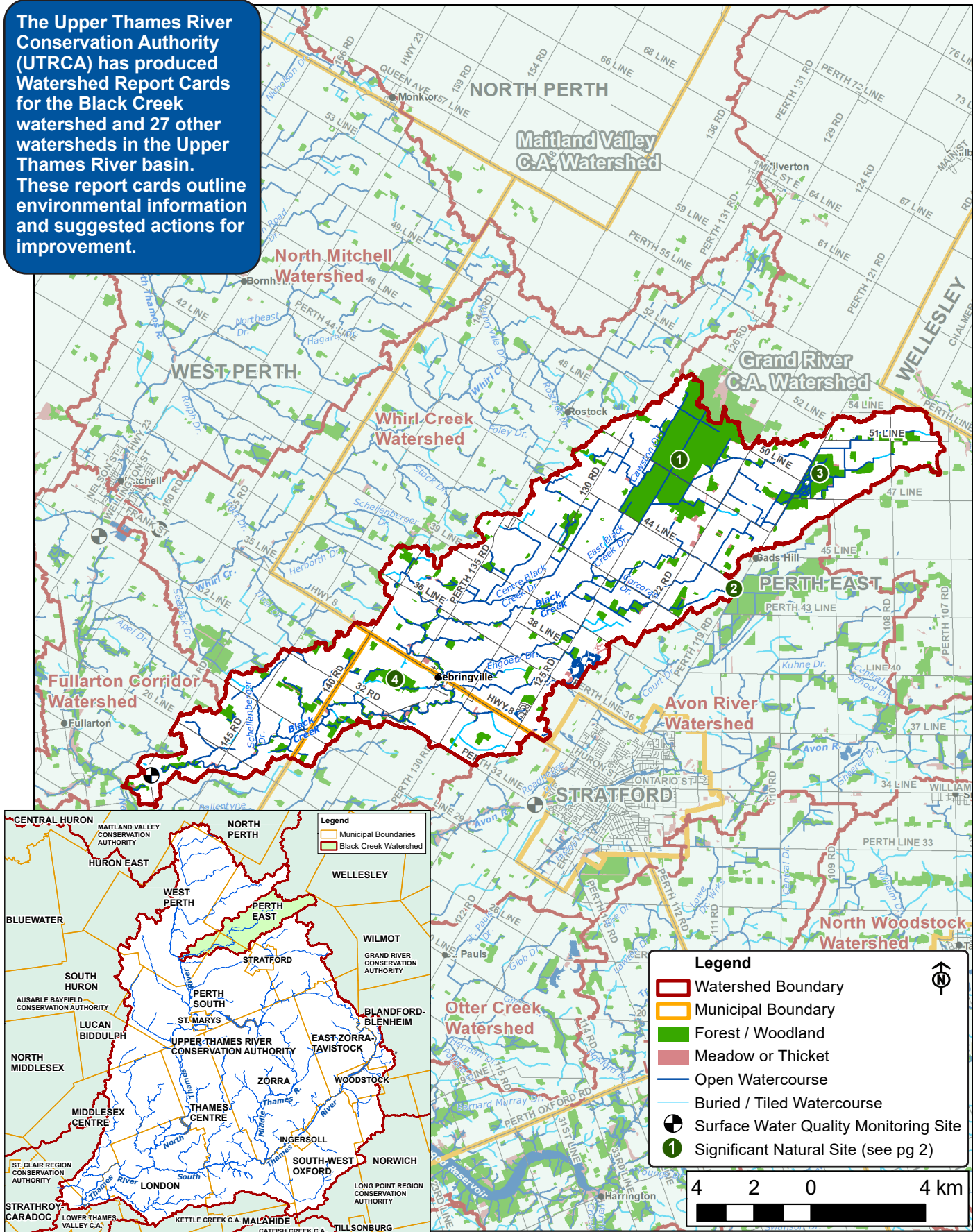


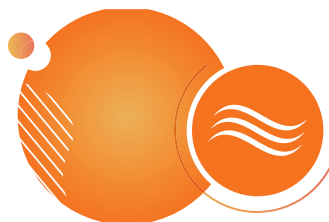
Forest Conditions  
**C - Slight Improvement**

2022 Watershed Report Card

# Black Creek

The Upper Thames River Conservation Authority (UTRCA) has produced Watershed Report Cards for the Black Creek watershed and 27 other watersheds in the Upper Thames River basin. These report cards outline environmental information and suggested actions for improvement.





# Watershed Features

Feature	Description																										
Municipalities	Perth East (74%, 104 km <sup>2</sup> ), West Perth (12%, 17 km <sup>2</sup> ), Perth South (14%, 19 km <sup>2</sup> ) Total Area: 13,993 ha (139 km <sup>2</sup> ), 4% of Upper Thames River watershed																										
Significant Natural Sites	Significant Wetlands: (1) Ellice Swamp, (2) Gads Hill Swamp South. Other Wetlands: (3) Gads Hill Swamp North, (4) Sebringville Woods. Life Science Areas of Natural and Scientific Interest (ANSI): (1) Ellice Huckleberry Swamp. (See map for numbered sites. Some sites have more than one designation). Earth Science ANSIs: Carlingford Spillway, Wartburg Road Cut, Seebach Hill Spillway																										
Land Cover	79% agriculture, 16% natural vegetation, 4% urban/built-up, < 1% aggregates, 1% water. There is 2% impervious cover (e.g., hard surfaces such as roofs and roads).																										
Population	2,331 in 2021; population has remained steady over the last 10 years																										
Soil Type	80% silty loam, 10% organic, 5% clay loam, 5% bottomland																										
Physiography	69% undrumlinized till plain, 15% till moraine, 9% peat muck, 7% spillway																										
Soil Erosion/ Delivery	5% highly erodible (lands that could potentially contribute > 7 tonnes/ha/yr of soil to a watercourse). The average for the Upper Thames River watershed is 9%.																										
Tiling and Drainage	62% of the watershed has agricultural field tile (24% random + 38% systematic), 4% urban drainage, 34% no tiling. There has been little change in the amount of tiled land compared with five years ago.																										
Watercourse Characteristics	Total length: Watercourse type: Temperature: Main channel slope:	220 km of watercourses 16% natural, 75% channelized, 10% buried/closed 23% cool/coldwater, 77% warmwater/unconfirmed 0.21% slope (low/flat); range is 0.09-1.26% in Upper Thames River watershed																									
Dams and Barriers	10 barriers to fish movement are recorded in the Black Creek watershed. Barriers include dams, weirs, perched culverts, and beaver dams.																										
Spills	<table><tr><th>2001-2005</th><th>2006-2010</th><th>2012-2015</th><th>2016-2020</th></tr><tr><td>3</td><td>0</td><td>1</td><td>0</td></tr></table>					2001-2005	2006-2010	2012-2015	2016-2020	3	0	1	0														
2001-2005	2006-2010	2012-2015	2016-2020																								
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Sewage Treatment	There are no sewage treatment plants discharging into Black Creek. Properties in the area are serviced by private septic systems.																										
% Vegetation Cover and Types	Vegetation cover: Composition:	2,172 ha (15.5% of the Black Creek watershed). 53% deciduous forest, 31% mixed forest, 9% plantation/coniferous forest, 7% meadow, 1% thicket																									
Wetland Cover	10.7% of the watershed is in wetland cover. Environment Canada (2013) recommends at least 6% wetland cover. 3 ha of wetland cover were lost between 2010 and 2015.																										
Woodlot or Patch Size	<table><tr><th>Size Category</th><th>Number of Woodlots</th><th>Average Size (ha)</th><th>Total Woodland Area (ha)</th><th>% of Woodland Area</th><th>Largest Woodlot (ha)</th></tr><tr><td>Small (&lt; 10 ha)</td><td>107</td><td>3</td><td>342</td><td>17</td><td rowspan="3">867</td></tr><tr><td>Medium (10-30 ha)</td><td>30</td><td>17</td><td>501</td><td>25</td></tr><tr><td>Large (&gt; 30 ha)</td><td>5</td><td>233</td><td>1166</td><td>58</td></tr></table>					Size Category	Number of Woodlots	Average Size (ha)	Total Woodland Area (ha)	% of Woodland Area	Largest Woodlot (ha)	Small (< 10 ha)	107	3	342	17	867	Medium (10-30 ha)	30	17	501	25	Large (> 30 ha)	5	233	1166	58
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Fish and Mussels	Fish Species: 35 (one more species, Mimic Shiner, found since the 2016 report cards) Gamefish Species: Smallmouth and Largemouth Bass, Yellow Perch, and Northern Pike Mussel Species: 7																										
Species-at-Risk	Birds: 7 species including Bank Swallow and Bobolink Fish: Northern Sunfish, Silver Shiner Insects: Monarch Mussels: Rainbow Reptiles: Midland Painted Turtle, Snapping Turtle																										

For more information on watershed features and how they compare to the other 27 subwatersheds, see the tables in the full report: 2022 Upper Thames River Watershed Report Cards at [www.thamesriver.on.ca](http://www.thamesriver.on.ca).



# Surface Water Quality

Surface water quality in Black Creek scores an overall grade of C and has remained steady since the last report card. A water quality monitoring station was added to Black Creek at Perth Line 20 in 2002 (see map). The UTRCA has a water quality target for Black Creek of a B grade by 2037.

Phosphorus levels have improved since 2015. Fecal bacteria (*E. coli*) levels score a C and have remained steady since 2015. Nitrate levels (sources such as fertilizer) have

been steady since 2000 and remain above the guideline for aquatic life. Chloride levels (mainly from road salt) have increased since 2015 but remain below aquatic guideline levels.

Stream health or water quality as indicated by benthic sampling indicated fairly consistent results, slightly better than the Upper Thames River average.

Indicators	Black Creek					Upper Thames 2016-2020	Provincial Guideline	Indicator Description
	1996- 2000	2001- 2005	2006- 2010	2011- 2015	2016- 2020			
<b>Phosphorus (mg/l) *</b>	No Date	0.065 D	0.056 C	0.109 D	<b>0.074 D Improved</b>	0.110 D	0.030 B Aquatic Life	Phosphorus is found in products such as fertilizer, detergents, and waste, and contributes to excess algae and low oxygen in streams and lakes.
<b>Bacteria (CFU <i>E. coli</i> / 100 ml) **</b>	No Data	125 C	233 C	186 C	<b>167 C Steady</b>	211 C	200 C Recreation	<i>E. coli</i> is a fecal coliform bacteria found in human and animal (livestock/wildlife/pets) waste. <i>E. coli</i> is a strong indicator of the potential to have other disease-causing organisms in the water.
<b>Benthic Score (FBI)</b>	5.98 D	5.49 C	5.57 C	5.62 C	<b>5.64 C Steady</b>	5.99 D	< 5.00 B Target Only	Benthic organisms (aquatic invertebrates that live in stream sediments) are good indicators of water quality and stream health. The Family Biotic Index (FBI) scores each taxa according to its pollution tolerance.

\*75th percentile, MECP Provincial Water Quality Monitoring Network data. \*\*Geometric mean, Health Unit data. Province-wide grading system used (see page 8). In 2019, the Provincial Recreational Guideline for *E. coli* changed from 100 Colony Forming Units *E. coli* / 100 ml to 200 CFU *E. coli* / 100 ml.

Fathead Minnow, found in Black Creek, have an interesting and important antipredator tactic. When injured by a predator they release chemical alarm pheromones alerting others to the threat. Researchers and regulatory agencies use the Fathead Minnow in their guidelines for the evaluation of acute and chronic toxicity of chemical products in vertebrate animals.



Extreme flooding in February 2018 in St. Marys, Ontario.

## Climate Change

Climate change continues to be a critical issue. Locally, storms and floods are becoming more intense and frequent, which affects water quality by increasing runoff and erosion. Flooding and increased temperatures also stress native plant and animal species. Many local municipalities and industries are enacting Climate Action Plans that focus on reducing greenhouse gases and developing adaptation strategies, including nature-based solutions. Increasing natural cover (trees, wetlands, and forests) and green cover (agricultural cover crops) will absorb carbon and improve resiliency to climate change impacts.





## 2022 Watershed Report Card

# Forest Conditions

Forest conditions in the Black Creek watershed have improved slightly since the 2017 report cards and score an overall grade of C. It should be noted that some of the change is due to improved mapping and boundary corrections.

The percent forest cover (14.4%) has increased slightly from 14.2% five years ago, primarily due to improved mapping and forest succession. The Environment Canada (EC) guideline for sustaining species and water quality in southern Ontario is minimum 30% forest cover. Meadows and thicket habitat types add another 1.2% cover for a total of 15.5% natural vegetation cover.

The percent forest interior (6.1%) has increased slightly from 5.8%, and is the highest in the Upper Thames River watershed, owing to the presence of Ellice Swamp. Large woodlots provide habitat for area sensitive birds such as Scarlet Tanager and Ovenbird. The guideline for southern Ontario is 10%. However, other than Ellice Swamp and Gads Hill Swamp, most of the other woodlots in the Black Creek watershed are small.

The percent riparian zone forested (27.7%) has increased from 20% five years ago, primarily due to improved mapping. Levels are still below the guideline of 50%. Additional riparian areas are in permanent meadows and thicket (6.5%) for a total of 34.2% riparian zone vegetated.

Indicators	Black Creek 2022*	Upper Thames Average 2022*	EC Guideline **	Indicator Description
% Forest Cover	14.4 D	11.3 D	30.0 B	Percent forest cover is the percentage of the watershed that is forested or wooded. Forest cover includes upland and wetland forest types.
% Forest Interior	6.1 C	1.5 F	10.0 B	Percent forest interior is the percentage of the watershed that is forest interior. Forest interior is the protected core area 100 m inside a woodlot that some bird species require to nest successfully. The outer 100 m is considered "edge" habitat and prone to high predation, wind damage and alien species invasion.
% Riparian Zone Forested	27.7 C	35.7 C	50.0 B	Percent riparian zone forested is a measure of the amount of forest cover within a 30 m riparian/buffer zone adjacent to all open watercourses. Riparian habitats support high numbers of wildlife species and provide an array of ecological functions including water quality protection.

\* 2022 report card data is based on 2015 colour air photography. \*\* EC Guideline - Environment Canada guideline based on "How much habitat is enough?" 2013. Grades based on Conservation Ontario (2022).

## Losses and Gains

### Forest Area Removed

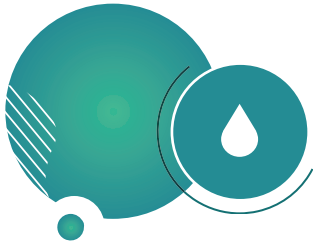
Years	ha	
2000-2006	2	Approximately 6 ha of forest were cleared and converted to other uses (e.g., urban, agriculture, aggregates) between the 2010 and 2015 air photography. An additional 5 ha of forest were cleared in the previous 10 years.
2006-2010	3	
2010-2015	6	

### Forest Area Gained

Years	ha	
2010-2015	18	New data shows that approximately 18 ha of forest were gained between 2010 and 2015 due to forest succession and improved mapping. Several 20- to 30-year-old tree planting sites and some thickets matured to the point where they could be classified as mature woodland in 2015. This data demonstrates the value of continued tree planting and conservation efforts.



White-breasted Nuthatches nest locally in tree cavities in deciduous and mixed woodlands.  
Photo: Sharon Nethercott.



# Groundwater

## Municipal Water Supply

A municipal well in Sebringville draws groundwater from a deep bedrock aquifer and supplies part of Sebringville, approximately 90 people. Municipal water is tested and treated.

## Private Wells

Approximately 461 private wells are on record in the Black Creek watershed, most drawing from bedrock aquifers. Properly constructed deep wells have a lower risk of contamination from the surface than shallow wells. The highest risk to any well is from contaminants and activities closest to the well. The safety, testing, and treatment of a private well are the responsibility of the well owner.

## Groundwater Monitoring

Since 2003, the UTRCA has monitored one Provincial Groundwater Monitoring Network well in this watershed. Data has shown groundwater levels generally decline from May to October, and increase (recharge) from late fall to early spring, with the largest increase in March (up to 1.5 m). Recent data shows the recharge period is shifting later to November to May, with a trend of warmer and drier weather from October to November and cooler temperatures in May. The rate of decline in groundwater

levels is directly related to maximum air temperatures.

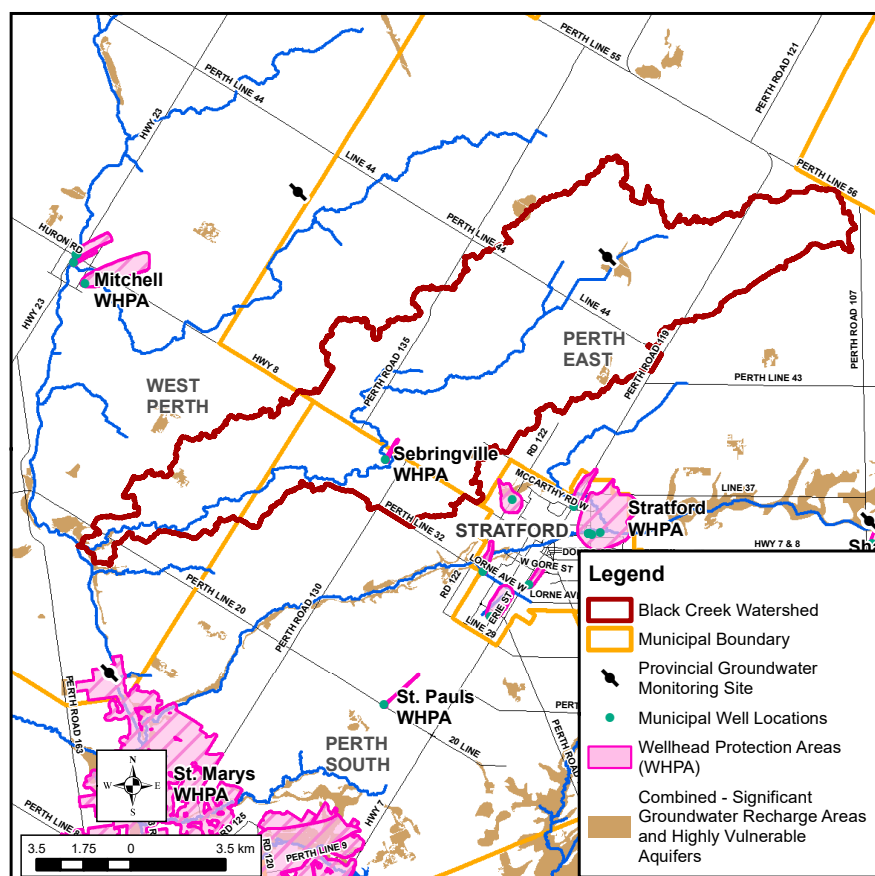
Summer rainfall does not typically affect groundwater levels as evaporation and plant uptake greatly exceeds rainfall, and most rainfall is utilized by plants during summer.

### Did you know?

- About 50-70% of total local streamflow is baseflow from groundwater discharging into streams.
- Vegetation relies more on groundwater as it is more stable than rainfall. Most remaining wetlands are groundwater dependent.

## Drinking Water Source Protection

Local source protection plans have been completed to protect sources of municipal drinking water. The Thames-Sydenham and Region Source Protection Plan (2015) has policies to address risks posed to municipal water systems. Visit [www.sourcewaterprotection.on.ca](http://www.sourcewaterprotection.on.ca) for information on groundwater resources and Source Protection Plan policies, and the Water Supply System Summary for Sebringville.



## On The Map

### Significant Groundwater Recharge Areas:

Areas where a relatively large volume of water makes its way from the ground's surface down to the aquifer.

### Highly Vulnerable Aquifers:

Areas where there is a relatively fast pathway from the ground's surface down to an aquifer, generally making the aquifer more vulnerable to contamination.

### Wellhead Protection Areas:

Areas surrounding the wellhead, through which contaminants are reasonably likely to move toward or reach the well.

**Protecting these areas is very important for the protection of local groundwater as a source of drinking water.**



# Local Actions for Improvement

Individuals, groups, businesses, municipalities, and agencies all have a role in improving the health of the watershed through these suggested actions. For more information on agencies that can help, contact the UTRCA (see page 8).

A number of the local actions listed below are also identified in the following reports:

- The Thames River (Deshkan Zibi) Shared Waters Approach to Water Quality and Quantity (Thames River Clearwater Revival, 2019)
- Perth County Natural Heritage Systems Study (Perth County, 2018 and 2019)
- Upper Thames River Source Protection Area Approved Assessment Report (Thames-Sydenham Source Protection Region, 2015)
- Ellice Swamp and Gads Hill Swamp Conservation Management Guiding Document (UTRCA, 2004)

## Local Actions to Improve Surface Water and Groundwater

- Protect and establish buffers (native trees, grasses) along watercourses to cool streams, provide food for aquatic species, stabilize banks, and trap and absorb nutrients and other pollutants.
- Consider dam or barrier removal to improve stream health and fish passage, especially when a barrier no longer serves its intended purpose.
- Use drain maintenance methods that protect aquatic habitat (e.g., low flow channels, spot or bottom cleanouts).
- Repair or replace faulty septic systems and ensure proper maintenance of the system.
- Continue to implement agricultural Best Management Practices (BMPs):
  - Use reduced tillage and establish cover crops to protect soil from erosion, prevent nutrient loss, and build soil health.
  - Reduce nutrient loss from cropland (4R Stewardship Approach: right source, right rate, right time, right place).
  - Use best practices in manure storage and spreading, pesticide and fertilizer storage and application, fuel storage, and restricting livestock access to watercourses.
  - Complete and follow Environmental Farm Plans and Nutrient Management Plans ([www.omafra.gov.on.ca](http://www.omafra.gov.on.ca)).
  - Utilize grants for stewardship work from the UTRCA Clean Water Program ([www.cleanwaterprogram.ca](http://www.cleanwaterprogram.ca)).
- In Sebringville, continue the following actions:
  - For new development, implement urban stormwater planning using Low Impact Development (LID), stormwater BMPs, subwatershed studies, catchment area planning, and erosion control.
  - Incorporate LID into the planning process and promote the implementation of LID techniques, including in Master Plans, Secondary Plans, and any subwatershed studies.
  - Consider using a water balance and landscape approach for inbuilt and new development to manage stormwater runoff.
  - Maintain base flow to natural heritage features through water balance.
  - For existing development, implement pollution prevention and control planning for all aspects of stormwater runoff including combined storm-sewer overflows.
  - Continue to upgrade sewer systems where risk of contamination is greatest (e.g., extend sanitary sewers to urban properties on septic systems).
  - Minimize use of fertilizers, adhere to Ontario's Cosmetic Pesticide Ban, and utilize the municipal hazardous waste disposal program.

## Local Actions to Improve Drinking Water

- Decommission abandoned wells according to Ministry of Environment, Conservation, and Parks standards.
- Homeowners with wells should understand the condition of their well and risks to their water supply (see [www.wellaware.ca](http://www.wellaware.ca)).
- Sample private wells each spring and fall (available through the Health Unit).
- Keep contaminants (e.g., fuel, pesticides, manure, waste) away from your well area. Consider septic system inspections (see [www.omafra.gov.on.ca](http://www.omafra.gov.on.ca)).
- To protect municipal drinking water sources, implement Source Protection Plan policies.



## Local Actions to Improve Forests and Vegetation Cover

- Connect the existing riverside woodlands and meadows with additional plantings to create a continuous wildlife corridor along Black Creek and its tributaries in this watershed.
- For tree planting projects, create a more natural and diverse habitat by using a variety of native plant species that are better adapted to the local climate, pests, etc. Tree planting assistance and grants are available from the UTRCA (see contact information on page 8).
- Continue to implement recommendations from the Ellice Swamp and Gads Hill Swamp Conservation Management Guiding Document (UTRCA, 2004). These large and diverse swamps provide valuable wildlife habitat.
- Conserve woodlands, wetlands, and other natural areas through Official Plan designations, tree cutting by-law enforcement, landowner incentives and education, etc.
- Connect woodlots by planting shelterbelts, windbreaks, and buffers along fields and watercourses, which will also protect against soil erosion and improve water quality. Older, denser windbreaks should be thinned.
- Increase forest interior by making woodlots larger and rounder (e.g., plant native trees and shrubs along the edges or allowing the edges to naturalize on their own).
- Landowners wishing to selectively log their woodlots should use Good Forestry Practices (i.e., Basal Area Guidelines, not Diameter Limit Harvesting) and hire a Certified Tree Marker to mark the woodlot and oversee harvesting.



Agricultural practices such as the use of cover crops and minimal tillage help the climate by reducing carbon loss while improving water quality and soil health.

## Great Lakes Connection

The Black Creek watershed is in the Thames River watershed, which is part of the Lake Erie watershed. Water from the Black Creek enters the North Thames downstream of Fullarton and takes 4-10 days to flow through London and Chatham, and into Lake St. Clair. About two weeks later, it reaches Lake Erie via the Detroit River.

## Shared Waters Approach

In 2012, partners in the Thames River watershed formed the Thames River Clear Water Revival to work together on the protection of water, with the shared goal of a healthy and vital Thames River which would also benefit Lake St. Clair and Lake Erie. This partnership brings together Indigenous peoples, three levels of government, two local conservation authorities, and the local community. A state of the environment report with a focus on actions needed for water quantity and quality was completed in 2019: The Thames River (Deshkan Zibi) Shared Waters Approach to Water Quality and Quantity. Implementation by all partners is underway. The Shared Waters Approach contains significant input from four of the eight distinct First Nations whose traditional territory includes the Thames River watershed and highlights the positive participation and sharing of traditional ecological knowledge within this approach.





## 2022 Watershed Report Card

# Highlights of Progress Since 2017

The Black Creek watershed is benefiting from the many conservation efforts of individuals, groups, businesses, agencies, and municipalities on private and public lands. Some examples follow.

- The UTRCA-owned portion of Ellice Swamp (882 ha) is now recognized by the provincial and federal governments as a Canadian Protected and Conserved Area. This Provincially Significant Wetland contributes to Canada's Aichi target of conserving 25% of Canada's land by 2025.
- The Friends of Ellice and Gads Hill Swamps and the UTRCA continue to co-manage these large wooded tracts, following the Ellice Swamp and Gads Hill Swamp Conservation Management Guiding Document (UTRCA, 2004). Hunting and hiking are allowed on set days and seasons. The Municipality of Perth East and partners began controlling the invasive Phragmites plant in the fall of 2017. Phragmites control has been targeted along the drainage ditches where it could spread into Ellice swamp. The Phragmites at the former Perth East landfill have been significantly reduced thanks to these recent efforts. In 2021, UTRCA staff completed a beetle release to help manage Purple Loosestrife in the Ellice Swamp. The beetles act as a biological control agent and their population will be monitored.
- Watershed landowners completed four Clean Water Program (CWP) projects including fragile land retirement and erosion control measures. The CWP was initiated in 2001 as a partnership between local municipalities to fund environmental projects ([www.cleanwaterprogram.ca](http://www.cleanwaterprogram.ca)). Since 2001, 58 CWP projects have been completed in the Black Creek watershed.
- 6,610 trees were planted into blocks, buffers, and windbreaks at 10 properties under the UTRCA's Private Land Reforestation Program from 2016 to 2020.



Purple Loosestrife Beetles

- Many municipalities in the Upper Thames River watershed are taking action on climate change. Perth County municipalities share a Climate Change Coordinator. There is a commitment to reducing emissions and taking action on climate change by the Federation of Canadian Municipalities under the Partners for Climate Protection Program, a network of more than 350 Canadian municipal governments.
- Perth County contracted the UTRCA to complete the Perth County Natural Heritage Systems Study (Perth County, 2018 and 2019) to identify existing important natural heritage features on the landscape.



Two hikers enjoying Ellice Swamp



Planting trees as part of the UTRCA's Private Land Reforestation Program



### Ontario-Wide Report Cards

Conservation Authorities produce report cards for their watersheds every five years to track changes, using a standardized grading system ([www.conservationontario.ca](http://www.conservationontario.ca)). Grades vary across the province, reflecting the range of physical characteristics and human activities. The complete set of UTRCA report cards and supporting information are available in a report titled 2022 Upper Thames River Watershed Report Cards ([thamesriver.on.ca](http://thamesriver.on.ca)).

### For more information, contact:

**Upper Thames River Conservation Authority**  
1424 Clarke Road, London, Ontario, Canada N5V 5B9  
519-451-2800  
[info@thamesriver.on.ca](mailto:info@thamesriver.on.ca)  
[www.thamesriver.on.ca](http://www.thamesriver.on.ca)



*Thames*  
Canadian Heritage River