



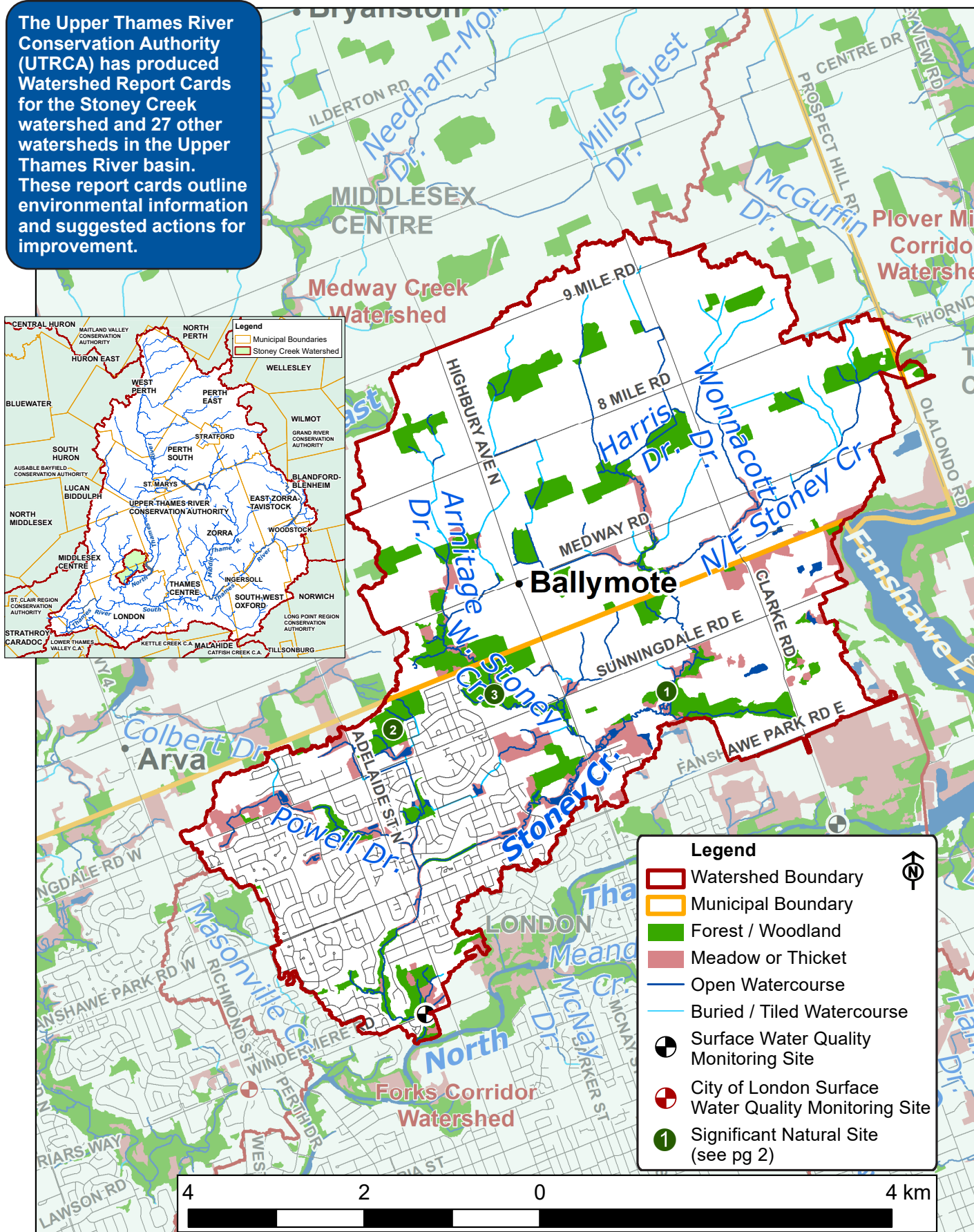
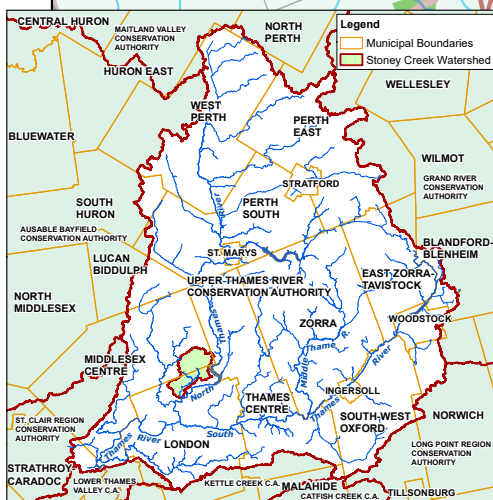
Surface Water Quality
C - Steady

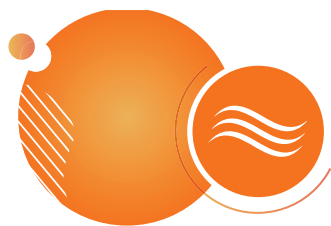


Forest Conditions
D - Slight Improvement

2022 Watershed Report Card **Stoney Creek**

The Upper Thames River Conservation Authority (UTRCA) has produced Watershed Report Cards for the Stoney 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	Middlesex Centre (53%, 20 km ²), City of London (47%, 18 km ²) Total Area: 3,799 ha (38 km ²), 1% of the Upper Thames River watershed														
Significant Natural Sites	Significant Wetlands: (1) Fanshawe Wetlands Complex, (2) Arva Moraine Wetland. London Environmentally Significant Areas: (1), (3) Ballymote Wetland ESA. (See numbered sites on map).														
Land Cover	51% agriculture, 16% natural vegetation, 6% open space, 23% built-up/urban, 4% aggregates, 1% water. 1.3% less agriculture and 1.5% more built-up than five years ago. 11% impervious cover (e.g., hard surfaces such as roofs and roads).														
Population	26,565 in 2021; a 19% increase since 2016														
Soil Type	36% silty loam, 22% not mapped (urban), 16% coarse sand, 13% clay loam, 9% bottomland, 4% fine sandy loam, 1% silty clay loam														
Physiography	49% spillway, 45% undrumlinized till plain, 6% till moraine														
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	30% of the watershed has agricultural tile (8% random + 22% systematic), 23% urban drainage, 48% no tiling.														
Watercourse Characteristics	Total length:	77 km of watercourses													
	Watercourse type:	36% natural, 35% channelized, 29% buried/closed													
	Temperature:	21% cool/coldwater, 79% warmwater/unconfirmed													
	Main channel slope:	0.51% slope (high/steep); range is 0.09-1.26% in Upper Thames River watershed													
Dams and Barriers	29 barriers to fish passage have been recorded, including dams, weirs, stormwater ponds, perched culverts, beaver dams, etc.														
Spills	<table><tr><th>2001-2005</th><th>2006-2010</th><th>2011-2015</th><th>2016-2020</th></tr><tr><td>5</td><td>9</td><td>2</td><td>3</td></tr></table>				2001-2005	2006-2010	2011-2015	2016-2020	5	9	2	3	Most recent reported spills involved industrial chemicals.		
2001-2005	2006-2010	2011-2015	2016-2020												
5	9	2	3												
Sewage Treatment	There are no sewage treatment plants discharging into Stoney Creek. The London portion of the watershed is serviced by the Adelaide Wastewater Treatment Plant which discharges treated effluent to the North Thames River. All rural properties in the watershed are serviced by private septic systems.														
% Vegetation Cover and Types	Vegetation cover:	585 ha or 15.4% of the watershed													
	Composition:	44% deciduous forest, 24% mixed forest, 4% plantation/coniferous forest, 23% meadow, 4% thicket													
Wetland Cover	5.2% (196 ha) of the watershed is in wetland cover. Environment Canada (2013) recommends at least 6% wetland cover. Approximately 4 ha of wetland cover were lost between 2010 and 2015.														
Woodlot or Patch Size	Size Category	Number of Woodlots	Average Size (ha)	Total Woodland Area (ha)	% of Woodland Area	Largest Woodlot (ha)									
	Small (< 10 ha)	38	3	114	28	61									
	Medium (10-30 ha)	12	17	199	49										
	Large (> 30 ha)	2	46	92	23										
Fish and Mussels	Fish Species: 49. Gamefish: Smallmouth Bass and Northern Pike. Mussels Species: 2.														
Species-at-Risk	Birds: 17 species including Canada Warbler and Chimney Swift. Fish: Black Redhorse, Northern Sunfish, and Silver Shiner. Insects: Monarch. Mussels: Rainbow. Reptiles: Midland Painted Turtle, Snapping Turtle, and Spiny Softshell Turtle. Plants: Butternut and Dense Blazingstar.														

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.



Surface Water Quality

Surface water quality in Stoney Creek has remained steady since the last report card and scores an overall grade of C. Samples were taken at the provincial water quality monitoring station at Windermere Road which was initiated in 2002 (see map). The UTRCA has a water quality target of a B grade for Stoney Creek by 2037.

Total phosphorus levels have been steady since 2015 with current levels close to the aquatic life guideline. *E. coli* bacteria levels have been steady since 2017, but are above the Upper Thames River average.

Chloride concentrations (mainly from is road salt) have had an increasing trend and some samples are now over the aquatic life guideline. Nitrate concentrations (from sources such as fertilizer) have remained steady with about half of the samples above the aquatic life guideline.

Stream health, as indicated by benthic sampling, has been fairly consistent over the years. The benthic water quality in this watershed is lower than the Upper Thames River watershed average.

Indicators	Stoney Creek					Upper Thames 2016-2020	Provincial Guideline	Indicator Description
	1996-2000	2001-2005	2006-2010	2011-2015	2016-2020			
Phosphorus (mg/l) *	No data	0.119 C	0.039 C	0.044 C	0.044 C Steady	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.
Bacteria (CFU <i>E. coli</i> / 100 ml) **	No data	554 C	267 C	221 C	281 C Steady	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.
Benthic Score (FBI)	6.19 D	6.03 D	6.32 D	6.25 D	6.33 D Steady	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.

Found in Stoney Creek, Goldfish are members of the carp family and are not native to Canada. It is illegal to release them into the wild as they can harm native species populations by eating aquatic plants and feeding on the eggs and larvae of native fish. They also stir up mud as they feed which increases the cloudiness of the water and, in turn, limits aquatic plant growth.



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.



Forest Conditions

Forest conditions in the Stoney Creek watershed have improved slightly since the last report card and score an overall grade of D. It should be noted that some of the change is due to improved mapping methods and boundary corrections.

The percent forest cover (10.7%) has increased from 10.3% in the last report card, primarily due to improved mapping but also some natural succession (see Forest Area Gained table). The Environment Canada (EC) guideline for sustaining species and water quality in southern Ontario is a minimum of 30% forest cover. Meadows and thickets add an additional 4.7% for a total of 15.4% natural vegetation cover.

The percent forest interior (0.8%) is very low, indicating that most woodlots are too small and/or narrow to support area sensitive species such as Ovenbird or Scarlet Tanager. The EC guideline for southern Ontario is 10% forest interior.

The percent riparian zone forested (33.6%) increased from 31.4% primarily due to improved mapping methods. Levels are still lower than the EC guideline of 50%. Additional riparian areas are in permanent meadows and thicket (21.7%) for a total of 55.3% riparian zone vegetated.

Indicators	Stoney Creek 2022*	Upper Thames Average 2022*	EC Guideline **	Indicator Description
% Forest Cover	10.7 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	0.8 F	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	33.6 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

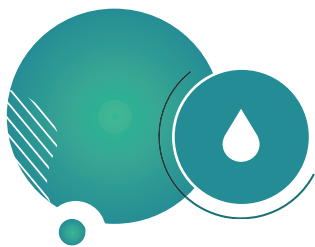
Years	ha	
2000-2006	36	Approximately 9 ha of forest were cleared and converted to other uses (e.g., urban, agriculture, aggregates) between the 2010 and 2015 air photography. An additional 40 ha of forest were cleared in the previous 10 years.
2006-2010	4	
2010-2015	9	

Forest Area Gained

Years	ha	
2010-2015	13	New data shows that approximately 13 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.



Great-crowned Flycatchers nest locally in tree cavities in mature forests. Photo: Sharon Nethercott



Groundwater

Municipal Water Supply

The portions of the watershed located in London are supplied by the London municipal water system via pipeline from its sources in Lakes Huron and Erie. All other areas in the watershed are supplied by groundwater. The six Fanshawe back-up emergency wells which served as a back-up source of groundwater for the City of London have now been discontinued and are no longer in use. They were properly decommissioned in 2020 to protect groundwater. Municipal water is tested and treated.

Private Wells

Approximately 260 private wells are on record in the Stoney Creek watershed with the majority drawing groundwater from overburden 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

The Provincial Groundwater Monitoring Network has shown groundwater levels generally decline from May to October and increase (recharge) from late fall to early spring, with

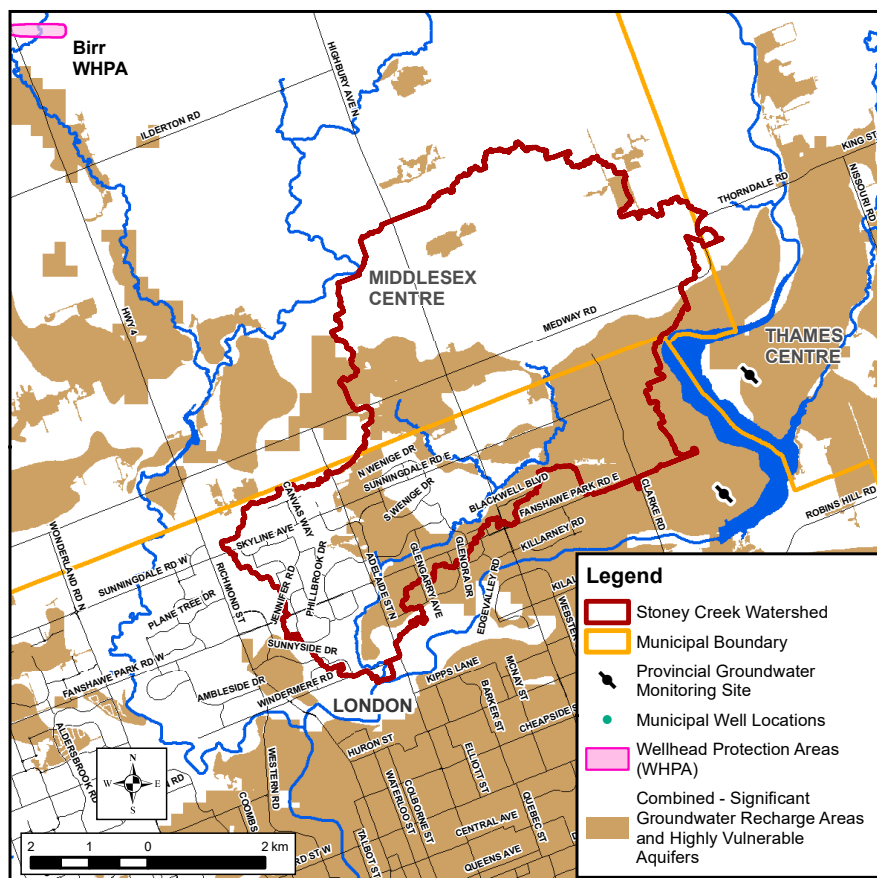
the largest increase in March (up to 1.5 m change). Recent data shows the recharge period is shifting later to November to May, with a trend of warmer and drier weather from October to November and cooler temperatures in May. The rate of decline in groundwater levels is directly related to maximum air 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 to municipal water systems. Visit www.sourcewaterprotection.on.ca for information on groundwater resources, Source Protection Plan policies, and the Water Supply System Summary for the City of London's back-up wells.



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

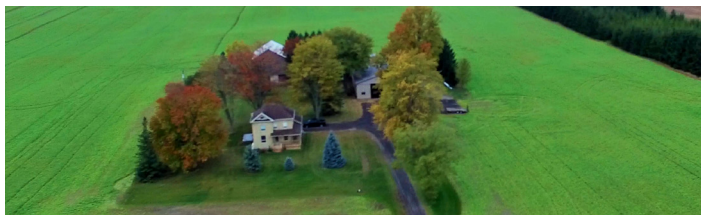
Individuals, groups, businesses, municipalities, and agencies all have a role in improving the health of the watershed through these suggested actions. For more information on agencies that can help, contact the UTRCA (see page 8).

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

- London Climate Emergency Action Plan or CEAP (2021/2022)
- London Wastewater Treatment Operations Master Plan (2021/2022)
- London Environmental Review Policy (2021)
- The Thames River (Deshkan Ziibi) Shared Waters Approach to Water Quality and Quantity (Thames River Clearwater Revival, 2019)
- London Pollution Prevention and Control Plan (2018)
- Upper Thames River Source Protection Area Approved Assessment Report (Thames-Sydenham Source Protection Region, 2015)
- Middlesex Natural Heritage Systems Study (Middlesex County, 2014)
- Status Review of Stoney Creek Subwatershed Study (IBI Group, 2007)

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.
- Stoney Creek supports a very diverse fish community and likely provides significant spawning, rearing, and feeding habitat. Further sampling is recommended to monitor the impacts of urban development and channel restoration projects on this resource.
- Evaluate the role, function, and aquatic habitat impacts of individual barriers and consider removal or modification to improve stream health and fish passage.
- 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).
 - Utilize grants for stewardship work from the UTRCA Clean Water Program (www.cleanwaterprogram.ca).
- In urban areas, 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 (e.g. 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.



The use of cover crops and minimal tillage helps the climate by reducing carbon loss while improving water quality and soil health.

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).
- 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).
- To protect municipal drinking water sources, implement Source Protection Plan policies.

Local Actions to Improve Forests and Vegetation Cover

- Ongoing efforts to naturalize and plant trees along Stoney Creek within London should be continued to create a continuous wildlife corridor.
- Tree planting and naturalization projects should be targeted to sites identified by the City of London as Corridors and Anti-Fragmentation Areas. These areas have the greatest potential to become good wildlife habitat. Landowner cooperation is required.
- Increase natural vegetation cover in urban areas by naturalizing manicured urban parks and open spaces, river valleys, residential and industrial areas, and school yards.
- Continue with overall area planning and implementation through community plans to ensure natural heritage features are protected and preserved with future development.
- For tree planting and naturalization 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. The UTRCA provides tree planting assistance and advice, and grants may be available (see contact information on page 8).
- Municipalities can conserve woodlands, wetlands, and other natural areas by strengthening tree conservation by-laws and enforcement, Official Plan designations, and providing landowner incentives and education.
- Increase forest interior by making woodlots larger and wider by planting 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.

Great Lakes Connection

The Stoney Creek watershed is in the Thames River watershed, which is part of the Lake Erie watershed. Water from Stoney Creek enters the North Thames River in London and takes 4-10 days to flow through 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 Stoney Creek watershed is benefiting from many conservation efforts that continue to be implemented by individuals, groups, businesses, agencies, and municipalities on private and public lands. Examples of activities since 2017 include:

- In 2019, London City Council declared a Climate Emergency. In response, the London Climate Emergency Action Plan or CEAP (2021/2022) was developed to reduce greenhouse gas emissions and improve resilience to climate change while listing over 200 actions for the London community to implement.
- London has continued sewer separation of old antiquated pipes and the installation of new separated storm and sanitary sewer pipes. Over 8 km (47% of 17 km) of combined sewers have been separated. London has plans for the separation of an additional 4 km of combined sewers to be completed by the end of 2025.
- A Tree Protection By-law was adopted by London Council (2016) that implements portions of the Urban Forest Strategy (2014) and Implementation Plan (2014). The goal is to increase canopy cover to 28% by 2035 and 34% by 2065.
- The London Plan was adopted by London City Council in 2016. It strengthens natural heritage and further protects the Thames River corridor. It also redirects urban growth to intensification rather than sprawl.
- Through the UTRCA's Communities for Nature program (2016-2020), 340 students and 120 community members helped plant 820 trees and 2,200 wildflowers and grasses at four sites. The sites included stormwater management ponds, schools in the area, and along the creek.
- The Clean Water Program was initiated in 2001 as a partnership between local municipalities to fund environmental projects (www.cleanwaterprogram.ca). Since 2001, 16 projects have been completed in this watershed.
- The Friends of Stoney Creek celebrated their 30th anniversary in 2022. Formed in 1992, this group works

with the UTRCA, City of London, and the local community to improve the health of Stoney Creek. They focus on stream rehabilitation, naturalization, invasive species removal, trail improvements, and education. The Friends of Stoney Creek volunteers host regular clean-ups and planted a second pollinator garden in 2021 (photo below).



UTRCA sampling efforts have recorded a total of 49 fish species in the Stoney Creek watershed, including Smallmouth Bass (shown above), Largemouth Bass, Bluegill, Coho Salmon, and Rainbow Darter.



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). 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).

For more information, contact:

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Thames
Canadian Heritage River