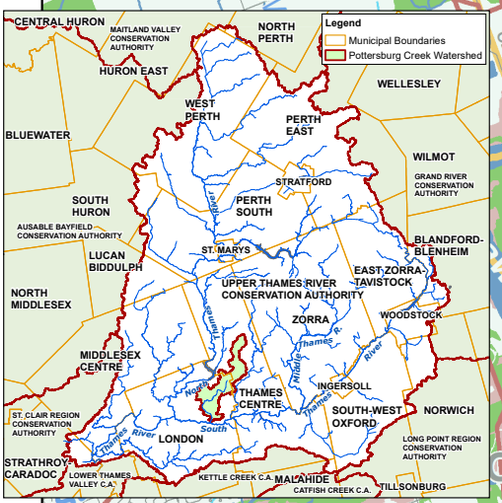
Surface Water Quality
D - Steady

Forest Conditions
D - Slight Decline

2022 Watershed Report Card

Pottersburg Creek

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



2022 Watershed Report Card

Watershed Features

<table>
<tr><th>Feature</th><th colspan="2">Description</th></tr>
<tr><td>Municipalities</td><td colspan="2">City of London (61%, 29 km^2), Thames Centre (39%, 19 km^2)
Total Area: 4,753 ha (48 km^2), 1% of the Upper Thames River watershed</td></tr>
<tr><td>Significant Natural Sites</td><td colspan="2">Wetlands: (1) Airport Wetland WN11D (see numbered site on map)</td></tr>
<tr><td>Land Cover</td><td colspan="2">44% agriculture, 9% natural vegetation, 9% open space, 38% built-up/urban, 0% aggregates, < 1% water. There has been little change from from years ago. There is 23% impervious cover (e.g., hard surfaces such as roofs and roads).</td></tr>
<tr><td>Population</td><td colspan="2">29,121 in 2021; a 15% increase since 2016 but some of this is due to watershed boundary corrections</td></tr>
<tr><td>Soil Type</td><td colspan="2">56% not mapped (urban, other), 17% silty loam, 11% clay loam, 6% coarse sand, 5% fine sandy loam, 3% very fine sandy loam, 2% silty clay loam, 1% bottomland</td></tr>
<tr><td>Physiography</td><td colspan="2">66% sand plain, 22% undrumlinized till plain, 11% spillway</td></tr>
<tr><td>Soil Erosion/ Delivery</td><td colspan="2">0% 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%.</td></tr>
<tr><td>Tiling and Drainage</td><td colspan="2">33% of the watershed has agricultural field tile (7% random + 25% systematic), 38% urban drainage, 30% no tiling</td></tr>
<tr><td>Watercourse Characteristics</td><td>Total length:
Watercourse type:
Temperature:
Main channel slope:</td><td>66 km of watercourses
12% natural, 65% channelized, 23% buried/closed
18% cool/coldwater, 82% warmwater/unconfirmed
0.36% slope (moderate); range is 0.09-1.26% in Upper Thames River watersheds</td></tr>
<tr><td>Dams and Barriers</td><td colspan="2">Eight barriers to fish passage have been recorded including the CN Railway drop structure. Other barriers include perched culverts, dams, weirs, beaver dams, and stormwater ponds.</td></tr>
<tr><td>Spills</td><td colspan="2"><table><tr><th>2001-2005</th><th>2006-2010</th><th>2011-2015</th><th>2016-2020</th></tr><tr><td>51</td><td>42</td><td>32</td><td>42</td></tr></table>Recent reported spills involved fuels industrial chemicals, fuels, and sewage.</td></tr>
<tr><td>Sewage Treatment</td><td colspan="2">The Pottersburg Wastewater Treatment Plant discharges treated effluent to the South Thames River and services the portion of this watershed that lies within London. Rural properties in the watershed are serviced by private septic systems.</td></tr>
<tr><td>% Vegetation Cover and Types</td><td>Vegetation cover:
Composition:</td><td>429 ha or 9% of the Pottersburg Creek watershed
57% deciduous forest, 1% mixed forest, 8% plantation/coniferous forest, 25% meadow, 8% thicket</td></tr>
<tr><td>Wetland Cover</td><td colspan="2">2% (94 ha) of the watershed is in wetland cover. Environment Canada (2013) recommends at least 6% wetland cover. Approximately 2 ha of wetland cover were lost between 2010 and 2015.</td></tr>
<tr><td>Woodlot or Patch Size</td><td colspan="2"><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 (< 10 ha)</td><td>61</td><td>2</td><td>151</td><td>52</td><td rowspan="3">27</td></tr><tr><td>Medium (10-30 ha)</td><td>9</td><td>15</td><td>137</td><td>48</td></tr><tr><td>Large (> 30 ha)</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td>Fish and Mussels</td><td colspan="2">Fish Species: 23 species
Gamefish: Smallmouth and Largemouth Bass, and Northern Pike
Mussel Species: not sampled</td></tr>
<tr><td>Species-at-Risk</td><td colspan="2">Birds: 6 species including Barn Swallow, Chimney Swift, and Eastern Meadowlark
Reptiles: Queensnake and Snapping Turtle</td></tr>
</table>

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.

2022 Watershed Report Card

Surface Water Quality

Surface water quality in Pottersburg Creek has been steady since the last report card and scores an overall grade of D. Samples were taken at the City of London monitoring station near the outlet at Hamilton Road. The UTRCA has a water quality target of a C grade for Pottersburg Creek by 2037.

Total phosphorus levels have been steady since 2017 and are just above the aquatic guideline. The levels are very low compared to most of the other 27 subwatersheds in the Upper Thames River watershed.

E. coli bacteria levels have been steady but remain elevated. Chloride concentrations (mainly from road salt) have shown an increasing trend from the 1980s to current levels which are mainly above the aquatic life guideline.

Nitrate levels (from sources such as fertilizer and waste) have had some decrease over the long term. Current levels are just above the provincial aquatic guideline.

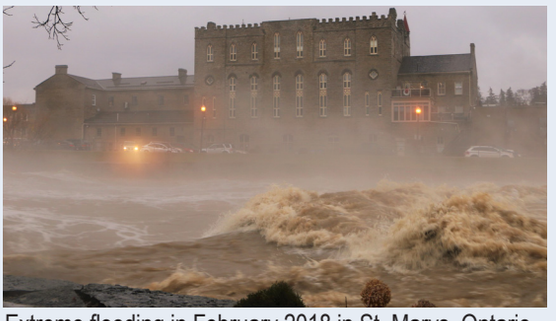
Benthic monitoring scores at the downstream monitoring station have varied over time. They have improved since the last reporting period but still show results typical of impaired water quality and stream health. A decline in conditions in the downstream urban area is also evident, as scores are better in the upstream rural areas.

There has been a history of other contaminants in the Pottersburg Creek. In 1980, PCB's were found in industrial areas of the watershed. Hydrocarbon deposits have been found in the floodplain and stream sediments.

Indicators	Pottersburg Creek					Upper Thames 2016-2020	Provincial Guideline	Indicator Description
	1996-2000	2001-2005	2006-2010	2011-2015	2016-2020			
Phosphorus (mg/l) *	0.143 D	0.113 D	0.100 D	0.040 C	**0.040 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 *E. coli*/ 100 ml) **	348 D	448 D	433 D	373 D	**346 D Steady**	211 C	200 C Recreation	*E. coli* is a fecal coliform bacteria found in human and animal (livestock/ wildlife/pets) waste. *E. coli* is a strong indicator of the potential to have other disease-causing organisms in the water.
Benthic Score (FBI)	6.75 F	7.38 F	6.91 F	7.46 F	**6.91 F Improved**	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, City of London monitoring data. **Geometric mean, City of London 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 Pottersburg Creek, Central Stonerollers live in large, compact schools. They can leap vertically out of the water, especially on warm days. They have specialized scraping mouth parts to scrape algae from rocks and can eat about 25% of their body weight in algae per day. The name "Stoneroller" comes from the behaviour of males, who use their noses to excavate nests.



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 Pottersburg Creek watershed have declined 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.

The percent forest cover (6.1%) decreased from 6.3% in 2017. The Environment Canada (EC) guideline for sustaining species and water quality in southern Ontario is a minimum of 30% forest cover–a challenge in urbanizing watersheds. Other habitat types such as meadows and thickets add another 3% for a total of 9.1% natural vegetation cover.

The percent forest interior (0.4%) is extremely low indicating almost all of the woodlots are too small and/or narrow to support area sensitive species such as Scarlet Tanager and Ovenbird. The EC guideline for southern Ontario is 10% forest interior.

The percent riparian zone forested (18.5%) is up from 15.9% in 2017, primarily as a result of improved mapping. Levels are still well below the target of 50%. Additional riparian areas are in permanent meadows and thicket (15.7%) for a total of 34.2% riparian zone vegetated.

Indicators	Pottersburg Creek 2022*	Upper Thames Average 2022*	EC Guideline **	Indicator Description
% Forest Cover	**6.1 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	**0.4 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	**18.5 D**	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	21
2006-2010	<1
2010-2015	4

Approximately 4 ha of forest were cleared and converted to other uses (e.g., urban, agriculture, aggregates) between the 2010 and 2015 air photography. An additional 21 ha of forest were cleared in the previous 10 years.

Forest Area Gained

Years	ha
2010-2015	11

New data shows that approximately 11 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.

Red-bellied Woodpeckers nest locally in tree cavities often at the edge of woodlands. Photo: Sharon Nethercott

2022 Watershed Report Card

Groundwater

Municipal Water Supply

The portions of the watershed located in London are supplied by the London municipal water system by pipeline. The water is sourced from Lake Huron and Lake Erie. Municipal water is tested and treated.

Private Wells

Approximately 400 private wells are on record in the Pottersburg 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.

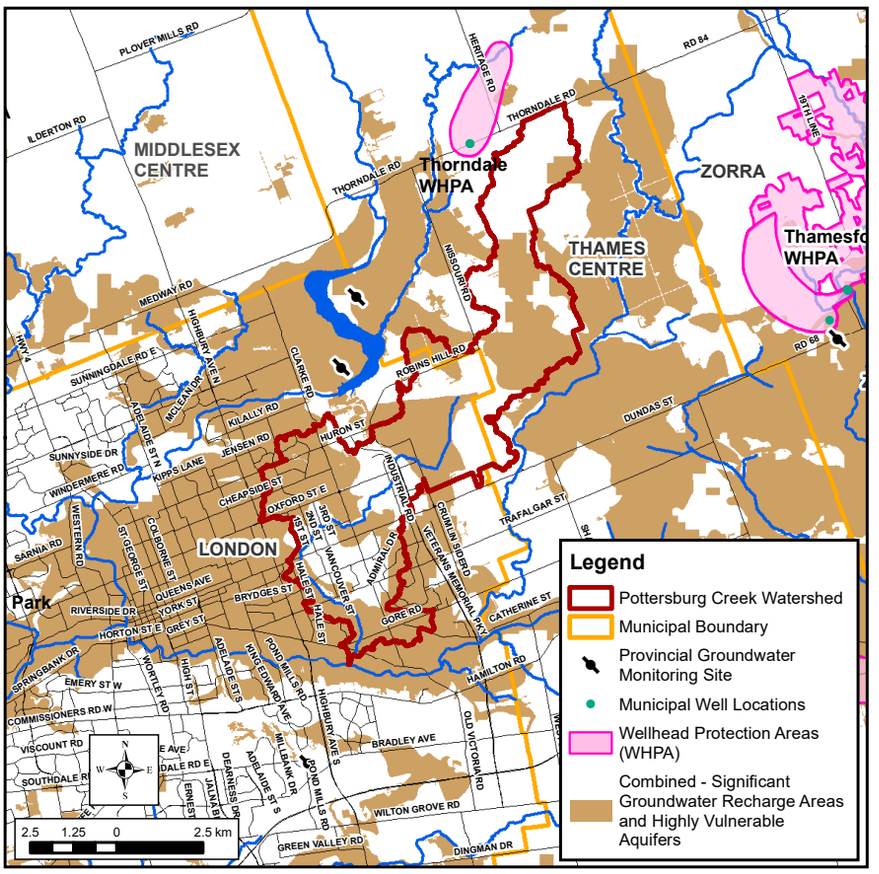
The rate of decline in groundwater levels is directly related to maximum air temperatures. Summer rainfall does not typically affect groundwater levels as evaporation and plant uptake greatly exceeds rainfall, and most rainfall is utilized by plants during summer.

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.



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.

2022 Watershed Report Card

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 Environmental Review Policy (2021)
- London Climate Emergency Action Plan or CEAP (2021/2022)
- London Wastewater Treatment Operations Master Plan (2021/2022)
- The Thames River (Deshkan Ziibi) Shared Waters Approach to Water Quality and Quantity (Thames River Clearwater Revival, 2019)
- London Pollution Prevention & 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)
- Pottersburg Creek Storm Drainage and Channel Remediation Study, Municipal Class EA (Cumming Cockburn, 2002)
- The Pottersburg Creek and Crumlin Drain Subwatershed Study (Paragon Engineering, 1995). Recent work to update this study has been completed

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.
- Use drain maintenance methods that protect aquatic habitat (e.g., low flow channels, spot or bottom cleanouts).
- Address spills through education and response.
- 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 London, continue the following actions:
  - For new development, implement urban stormwater planning using Low Impact Development (LID), stormwater BMP, 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.

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

- Connect the existing riverside woodlands and meadows with additional plantings to create a continuous wildlife corridor along Pottersburg Creek and its tributaries.
- Increase natural vegetation cover in urban areas by targeting the naturalization of manicured parks and open spaces, river valleys, residential and industrial areas, school yards, and through urban planning and design.
- 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.
- Connect isolated 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 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.
- Woodlot owners can improve the quality of their woodlots by identifying and removing invasive alien species such as buckthorn (see www.ontarioinvasiveplants.ca and www.thamesriver.on.ca). Keep out livestock and unauthorized motorized vehicles to protect habitat quality.

Great Lakes Connection

The Pottersburg Creek watershed is in the Thames River watershed, which is part of the Lake Erie watershed. Water from Pottersburg Creek enters the Thames River in London and takes 4-10 days to flow through London and Chatham, and then 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 Ziibi) 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 Pottersburg 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.
- The City of London extended the Thames Valley Parkway along Pottersburg Creek, over the CN railway, and through Kiwanis Park. Extensive wildflower and tree planting occurred along sections of the new trail.
- The City of London developed a Pollution Prevention Control Plan that provides a long-term strategy for infrastructure improvement projects to mitigate the impacts of wet weather sewer system overflows on the Thames River. A municipal class Environmental Assessment (2016) looked at sewage treatment optimization for the Pottersburg and Vauxhall Pollution Control Plants.
- In 2020, the interconnecting force main linking Pottersburg Wastewater Treatment Plant (WWTP) to Vauxhall WWTP was completed. The transfer pump station is in the design phase. These works are part of upgrades to improve efficiency and protect water quality
- A Tree Protection By-law was adopted by London City Council (2016) that implements portions of the Urban Forest Strategy (2014) and Implementation Plan (2014). The goal is to increase tree canopy cover to 28% by 2035 and 34% by 2065.
- The City of London has made advancements in forestry policies including a new private Tree Protection By-law (2021), Tree Planting Strategy (2017-2021), and others. The TreeMe grant program for planting trees on private lands was also expanded. Note: tree canopy cover is different from forest cover as tree canopy includes street and yard trees.
- The London Plan was adopted by London City Council in 2016. It strengthens natural heritage and further protects the Thames River corridor. It redirects urban growth to intensification rather than sprawl.
- Over 730 trees were planted at two sites through the UTRCA's Private Land Reforestation Program from 2016 to 2020.
- Watershed landowners completed a Clean Water Program (CWP) project involving fragile land retirement/reforestation. The CWP was initiated in 2001 as a partnership between local municipalities to fund environmental projects (www.cleanwaterprogram.ca).
- London has continued sewer separation of old antiquated pipes and the installation of new separated storm and sanitary sewer pipes. 8 km (47.6% of 17 km) of combined sewers have been separated. London has plans for the separation of an additional 4 km of combined sewer to be completed by the end of 2025.
- The UTRCA manages the Pottersburg Environmentally Significant Area under contract with the City of London. Since 2018, an Oak Savanna Habitat Enhancement Project was undertaken, planting and seeding native tallgrass prairie and savanna grasses and flowers under the mature oak trees (photo below).

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:

Upper Thames River Conservation Authority
1424 Clarke Road, London, Ontario, Canada N5V 5B9
519-451-2800
infoline@thamesriver.on.ca
www.thamesriver.on.ca

UPPER THAMES RIVER CONSERVATION AUTHORITY

Thames Canadian Heritage River