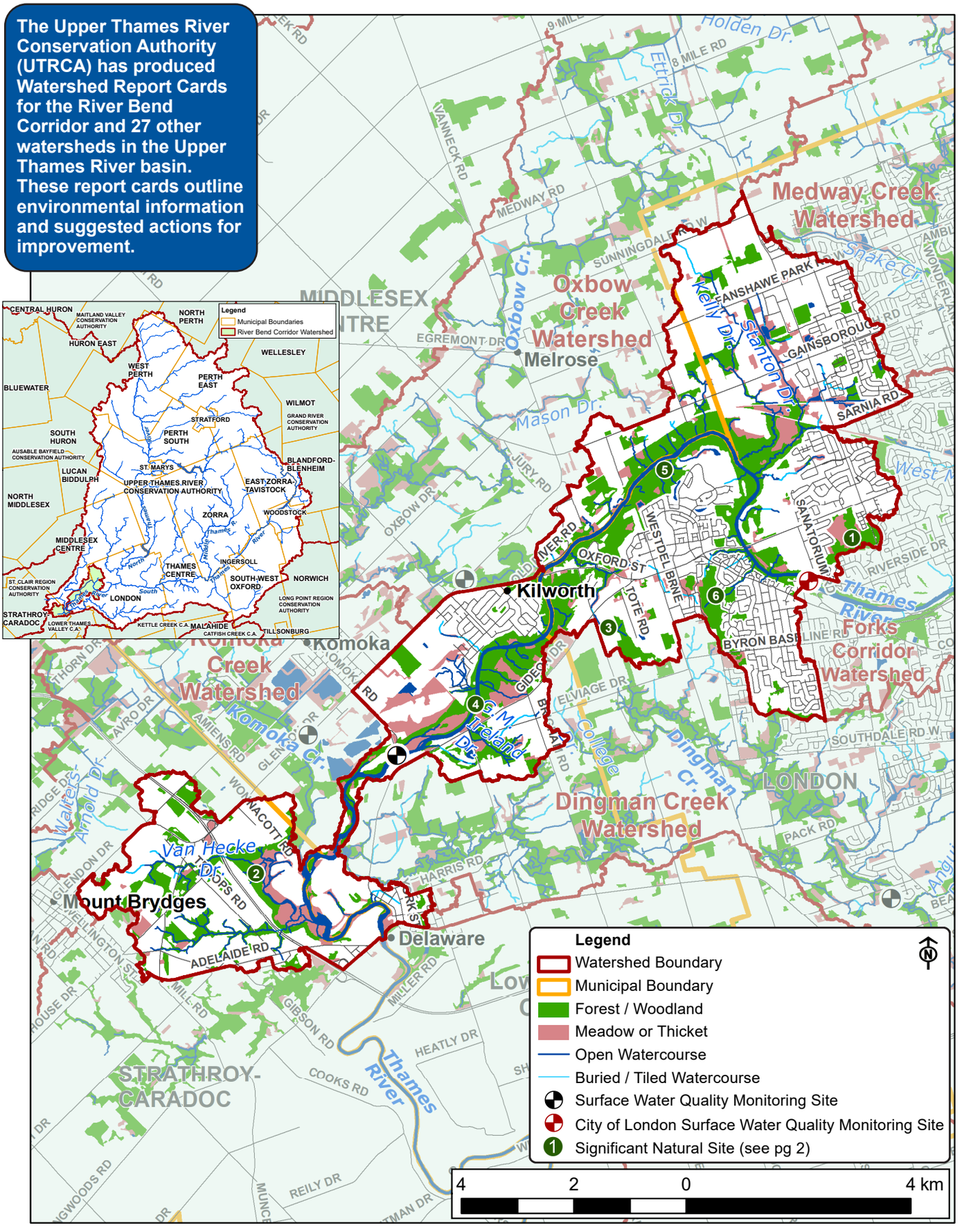
Surface Water Quality
D - Steady

Forest Conditions
C - Steady

2022 Watershed Report Card

River Bend

The Upper Thames River Conservation Authority (UTRCA) has produced Watershed Report Cards for the River Bend Corridor 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

Feature	Description
Municipalities	London (52%, 29 km^2), Middlesex Centre (29%, 16 km^2), Strathroy-Caradoc (19%, 11 km^2) Total Area: 5,607 ha (56 km^2), 2% of the Upper Thames River watershed. 3,348 km^2 lies upstream.
Significant Natural Sites	Significant Wetlands: (1) Sifton Bog, (2) Komoka/South Strathroy Cr, (3) Dingman Fen, (4) Komoka Park Reserve Wetland Complex. Life Science Areas of Natural and Scientific Interest: (1), (4), (5) Kains Road River Valley. London Environmentally Significant Areas (ESAs): (5), (6) Warbler Woods ESA. (See numbered sites on map. Some sites have more than one designation).
Land Cover	28% agriculture, 29% natural, 7% open space/golf, 32% built-up/urban, 1% aggregates, 4% water. There is 1.3% less agriculture, 1% less open space, 1% more natural vegetation, and 1.5% more built-up than five years ago. 14% impervious cover (e.g., hard surfaces such as roofs and roads).
Population	37,937 in 2021; a 14% increase since 2016
Soil Type	25% not mapped (urban), 21% silty loam, 15% bottomland, 13% coarse sand, 9% loamy fine sand, 6% silty clay loam, 6% clay loam, 5% sandy loam
Physiography	40% spillway, 22% sand plain, 22% undrumlinized till plain, 13% till moraine, 3% water, 1% beaches or shore cliffs
Soil Erosion/ Delivery	6% 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	14% of the watershed has agricultural tile (12% random, 2% systematic), 32% urban drainage, 54% no tiling
Watercourse Characteristics	Total length: 109 km of watercourses Watercourse type: 69% natural, 20% channelized, 10% buried/closed Temperature: 30% cool/coldwater, 70% warmwater/unconfirmed Main channel slope: 0.40% slope (moderately steep) along Thames River, 0.99% slope (very steep) along Van-Hecke Drain, 1.26% slope (very steep) along Stranton Drain. The range is 0.09-1.26% in Upper Thames River watershed
Dams and Barriers	50 barriers to fish passage have been recorded, including perched culverts, dams, weirs, debris blockages, beaver dams, and stormwater ponds.
Spills	2001-2005: 8; 2006-2010: 31; 2011-2015: 25; 2016-2020: 31 Recent reported spills involved fuels industrial chemicals and sewage.
Sewage Treatment	London's Oxford Wastewater Treatment Plant (WWTP), Komoka WWTP, and Mount Brydges WWTP discharge treated effluent to the Thames River. Rural residences are serviced by private septic systems.
% Vegetation Cover and Types	Vegetation cover: 1,550 ha or 27.6% of the watershed Composition: 44% deciduous forest, 24% mixed forest, 4% plantation/coniferous forest, 23% meadow, 4% thicket
Wetland Cover	5.5% (310 ha) of the watershed is in wetland cover. Environment Canada (2013) recommends at least 6% wetland cover. 1.5 ha of wetland cover were lost between 2010 and 2015.
Woodlot or Patch Size	Small (< 10 ha): 93 woodlots, average size 2 ha, total woodland area 205 ha, 18% of woodland area Medium (10-30 ha): 11 woodlots, average size 19 ha, total woodland area 208 ha, 19% of woodland area Large (> 30 ha): 9 woodlots, average size 79 ha, total woodland area 710 ha, 63% of woodland area Largest woodlot: 148 ha
Fish and Mussels	Fish Species: 57 including Least Darter and Pugnose Minnow. Gamefish: Smallmouth and Largemouth Bass, Walleye, and Brown, Rainbow, and Brook Trout. Mussel Species: 22.
Species-at-Risk	Birds: 15 species including Bank Swallow. Fish: 4 species including Eastern Sand Darter. Mammals: American Badger. Mussels: 4 species including Fawnsfoot Mussel. Plants: 6 species including Blue Ash. Reptiles: 6 species including Midland Painted Turtle and Spiny Softshell.

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 indicators have remained steady since the last report card and score an overall grade of D. This is the most downstream section of the Upper Thames River, so its water quality is influenced by land uses and activities in the area and throughout the entire Upper Thames River watershed. Samples are taken at the monitoring station at Komoka Road bridge (see map). The UTRCA has a water quality target of a C grade for River Bend Corridor by 2037.

Phosphorus levels at Komoka Road bridge have remained elevated since 2015, and are higher than the upstream station at Byron. Levels are at six times the provincial aquatic guideline. *E.coli* levels have improved over the long term, and are better than the Upper Thames River average. *E. coli* levels show improvement from the upstream station at Byron to the Komoka Road station.

Metals (copper, lead, and zinc) have shown major reductions since the 1980s to current levels below provincial guidelines. Chloride levels (mainly from road salt) have shown an increasing trend over the long term, but levels remain below the aquatic life guideline. Nitrate levels (from sources such has fertilizer and waste) have improved and since 2015 are below 2 times the provincial guideline.

Stream health based on benthic scores has declined since the last reporting period. Benthic scores at this location are worse than the Upper Thames River average.

Indicators	River Bend Corridor Creek					Upper Thames 2016-2020	Provincial Guideline	Indicator Description
	1996-2000	2001-2005	2006-2010	2011-2015	2016-2020			
Phosphorus (mg/l) *	0.187 F	0.140 D	0.135 D	0.163 D	**0.192 F 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) **	319 D	143 C	202 C	245 C	**176 C Improved**	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)	5.82 D	6.19 D	5.90 D	6.22 D	**6.69 F Declined**	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, 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.

Gizzard Shad move up the Thames River from Lake St. Clair in late fall. In the winter of 2020-2021, large numbers of shad were reported in the City of London at warmer locations such as the wastewater treatment plant discharge areas.

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 River Bend Corridor watershed have remained fairly steady since the last report card and score an overall grade of C. It should be noted that some of the change is due to improved mapping methods and boundary corrections.

The percent forest cover (20.0%) has increased from 19.3% in the last report card, primarily due to improved mapping. The Environment Canada (EC) guideline for sustaining species and water quality in southern Ontario is minimum 30% forest cover. Meadows and thickets add another 7.6% for a total of 27.6% natural cover–the highest cover of the 28 Upper Thames River subwatersheds.

The percent forest interior (1.7%) is low, indicating that most woodlots are too narrow to support area sensitive species such as Scarlet Tanager and Ovenbird. The EC guideline is 10% forest interior.

The percent riparian zone forested (55.3%) has increased from 52.9% five years ago due to improved mapping. Levels are slightly higher than the EC guideline of 50%, and the highest of the Upper Thames River subwatersheds. Additional riparian areas are in permanent meadows and thicket (18.9%) for a total of 74.2% riparian zone vegetated.

Indicators	Reynolds Creek 2022*	Upper Thames Average 2022*	EC Guideline **	Indicator Description
% Forest Cover	**20.0 C**	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	**1.7 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	**55.3 B**	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

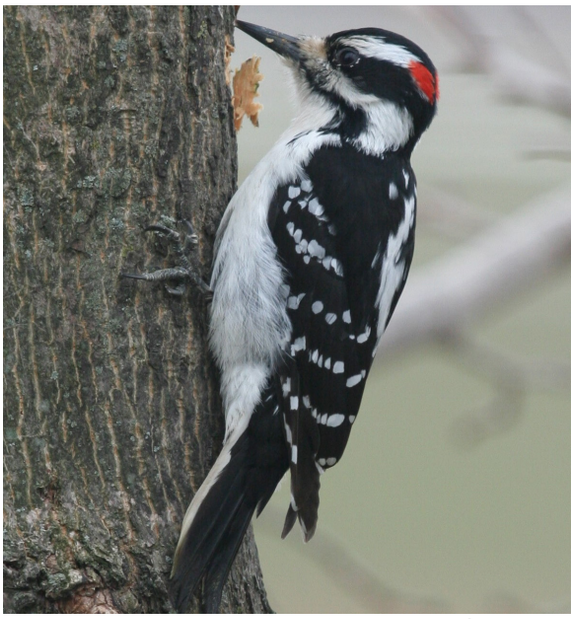
Years	ha
2000-2006	59
2006-2010	21
2010-2015	18

Approximately 18 ha of forest were cleared and converted to other uses (e.g., urban, agriculture, aggregates) between the 2010 and 2015 air photography. An additional 80 ha of forest were cleared in the previous 10 years.

Forest Area Gained

Years	ha
2010-2015	15

New data shows that approximately 15 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.



Hairy Woodpeckers nest locally in tree cavities, often in more mature forests. Photo: Brenda Gallagher

2022 Watershed Report Card

Groundwater

Municipal Water Supply

Since 2010, Mount Brydges and Komoka no longer use groundwater from municipal wells. A pipeline supplies water from Lake Huron through the Lake Huron Primary Water Supply System. The areas of the watershed within London are supplied by the London municipal water system pipeline from Lake Huron and Lake Erie. Municipal water is tested and treated. The Hyde Park back-up emergency well was decommissioned in 2020.

Private Wells

Approximately 710 private wells are on record in the River Bend Corridor watershed, drawing groundwater from bedrock and 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

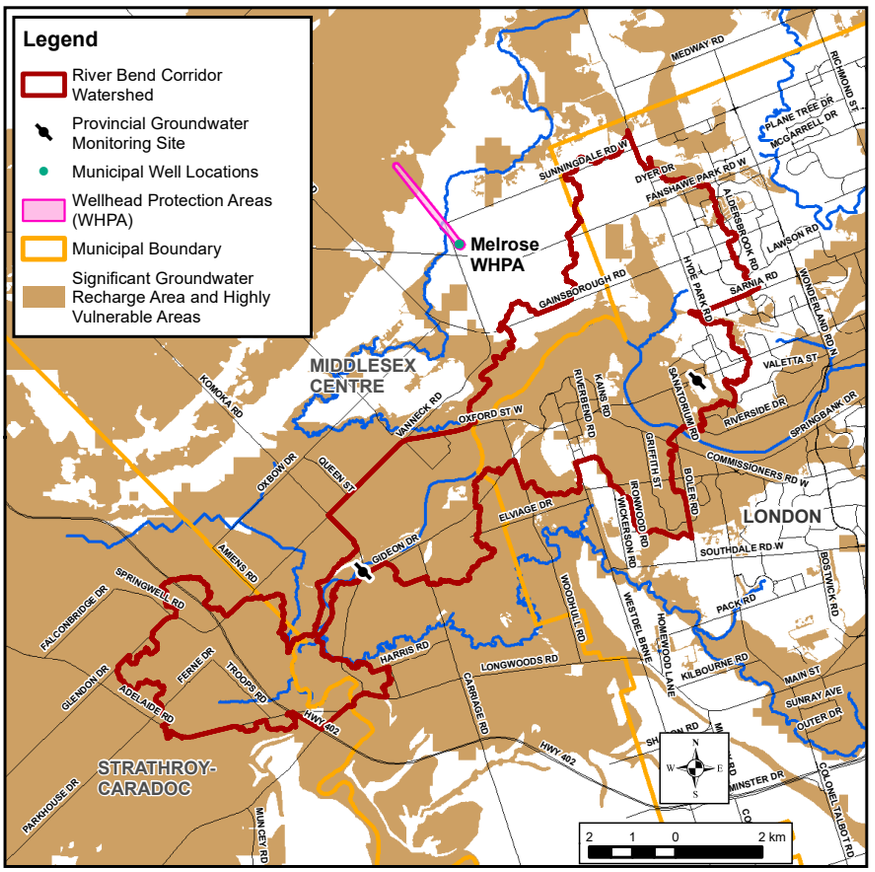
Since 2003, the UTRCA has monitored three Provincial Groundwater Monitoring Network wells in this watershed. They have shown groundwater levels generally decline from May to October and increase (recharge) from late fall to early spring, with the largest increase in March (up to 1.5 m change). Recent 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.

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 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)
- Upper Thames River Source Protection Area Approved Assessment Report (Thames-Sydenham Source Protection Region, 2015)
- Middlesex Natural Heritage Systems Study (Middlesex County, 2014)
- Thames Valley Corridor Study Phases 1 and 2 (City of London, 2007 and 2012)
- Comprehensive Review of Settlement Area Designations in the Middlesex Centre Official Plan (Middlesex Centre, 2011)
- Recovery Strategy for the Thames River Aquatic Ecosystem (Thames River Recovery Team, 2007)
- Thames Valley Downstream Subwatershed Study (Aquafor Beach, 2005)
- Kilworth Area Alternative Storm Water Management Strategies (McCormick Rankin, 2004)
- Riverbend South Community Plan (2008) and Riverbend Community Plan (City of London, 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.
- This watershed has many dams/barriers. 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 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).
- 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

- Much of the forest cover within this narrow watershed lies along the Thames River, which benefits both the river and wildlife. Since urban development pressure is high, the goal is to maintain the existing riparian woods and expand it where possible.
- 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.
- Create wildlife corridors between woodlots by planting shelterbelts, windbreaks, and buffers along fields and watercourses, which will also protect against soil erosion.
- 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 River Bend Corridor is in the Thames River watershed, which is part of the Lake Erie watershed. Water from the River Bend Corridor 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 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 River Bend Corridor 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.
- Greenway Wastewater Treatment Plant (WWTP) completed a significant three-year expansion project in 2018 to increase treatment capacity by 12%. The Greenway WWTP Climate Resiliency Environmental Assessment (2020/2021) was completed to improve resilience to extreme wet weather events. Vauxhall WWTP completed a vegetated berm and effluent pumping station for flood protection in 2021.
- The Kilworth WWTP was decommission in 2019. That wastewater is now pumped to the Komoka WWTP, improving efficiency and water quality.
- London has continued sewer separation of old antiquated pipes and the installation of new separated storm and sanitary sewer pipes. 8 km (47% of 17 km) of combined sewers have been separated. The City has plans for the separation of an additional 4 km of combined sewer to be completed by the end of 2025.
- The 2010 Komoka Park Management Plan is being implemented by Ontario Parks to protect and manage this exceptional site. Some 201 species of birds have been recorded from the park (eBird Middlesex).
- 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 expanded, and the City has set a goal to increase canopy cover to 28% by 2035 and 34% by 2065. 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 also redirects urban growth to intensification rather than sprawl.
- Over 1,280 trees were planted at seven sites through the UTRCA's Private Land Reforestation Program from 2016 to 2020.
- Through UTRCA's Communities for Nature program (2016-2020), over 800 students and community members helped plant 1,220 trees at eight different sites.
- Sifton Bog Environmentally Significant Area (ESA) and Kains Woods ESA continue to be managed by the UTRCA under agreement with the City of London. In both ESAs, projects completed include invasive alien species control, vegetation restoration, and trail and boardwalk improvements. A new ESA, Kelly Stanton, was added and early management has begun.
- Watershed landowners completed one Clean Water Program (CWP) project involving fragile land retirement/ reforestation.
- At nest sites, UTRCA researchers collect the eggs of the threatened Spiny Softshell turtle, incubate them, and release the healthy hatchlings back into the river to counter the 99% turtle egg mortality rate. Since this work begain in the 1990s, the local Softshell population has grown along with their range along the Thames River.

Spiny Softshell Turtle

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