



Surface Water Quality  
**D - Declined**

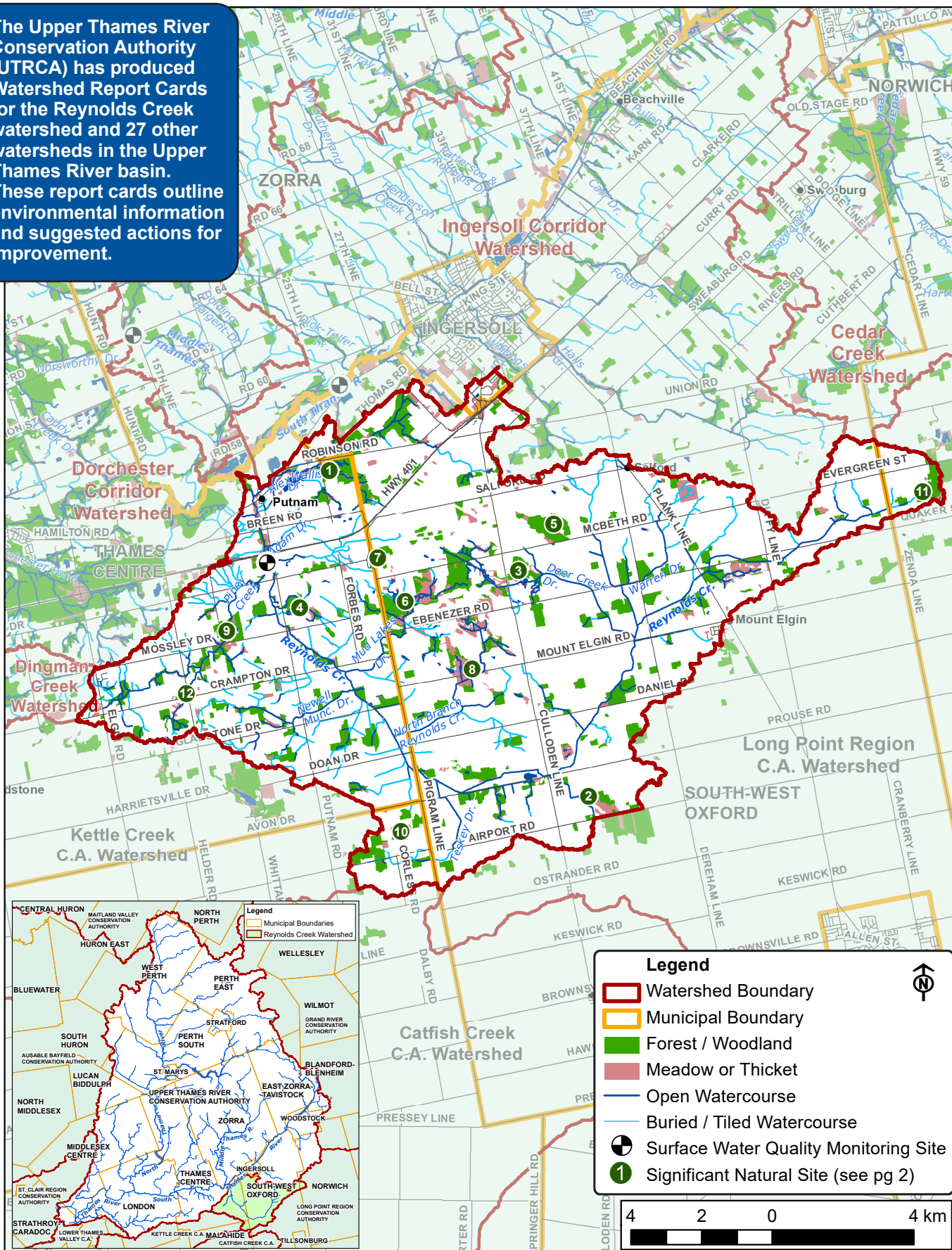


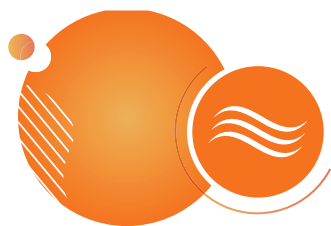
Forest Conditions  
**D - Steady**

2022 Watershed Report Card

# Reynolds Creek

The Upper Thames River Conservation Authority (UTRCA) has produced Watershed Report Cards for the Reynolds 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	South-West Oxford (64%, 109 km <sup>2</sup> ), Thames Centre (31%, 52 km <sup>2</sup> ), Malahide (3%, 5 km <sup>2</sup> ), Norwich (2%, 3 km <sup>2</sup> ). Total Area: 16,904 ha (169 km <sup>2</sup> ), 5% of the Upper Thames River watershed.					
Significant Natural Sites	Significant Wetlands: (1) Five Point Woods, (2) Dereham Wetlands, (3) Deer Cr Wetlands, (4) North Crampton Swamp, (5) Lawson Swamp/Salford Woods, (6) Mud Lakes, (7) Sholdice Swamp, (8) Vershoyle Wetlands. Other Wetlands: (9) NW Crampton, (10) Avon Wetland, (11) Zenda Tract, (12) Crampton Rd/Piney Cr Headwaters ND17E. Life Science Areas of Natural and Scientific Interest: (5), (11). (See numbered sites on map. Some sites have more than 1 designation).					
Land Cover	78% agriculture, 15% natural vegetation, 1% open space, 6% built-up/urban, < 1% aggregates, 1% water. There is 0.5% less agriculture, 0.5% more natural vegetation, and 0.3 more built-up than five years ago. 3% impervious cover (e.g., hard surfaces such as roofs and roads).					
Population	2,933 in 2021; a 20% increase since 2016 but some of this increase is due to watershed boundary corrections.					
Soil Type	48% clay loam, 19% silty clay loam, 10% silty loam, 6% sandy loam, 5% organic, 5% loam, 3% fine sandy loam, 2% bottomland, 1% coarse sand					
Physiography	43% spillway, 41% till moraine, 16% undrumlinized till plain					
Soil Erosion/Delivery	26% highly erodible (lands that could potentially contribute > 7 tonnes/ha/yr of soil to a watercourse). The average of the Upper Thames River watershed is 9%.					
Tiling and Drainage	36% of this watershed has agricultural field tile (15% random + 21% systematic), 6% urban drainage, 58% no tiling. An additional 7% of the watershed is tiled/drained compared to five years ago.					
Watercourse Characteristics	Total length: Watercourse type: Temperature: Main channel slope:	273 km of watercourses 18% natural, 43% channelized, 39% buried/closed 13% cool/coldwater, 87% warmwater/unconfirmed 0.26% slope (flat); range is 0.09-1.26% in Upper Thames River watersheds				
Dams and Barriers	22 barriers to fish passage have been recorded, including perched culverts, dams, weirs, debris blockages, beaver dams, and stormwater ponds.					
Spills	2001-2005	2006-2010	2011-2015	2016-2020	Recent reported spills involved fuels industrial chemicals, fuels, sewage, and others.	
	2	15	8	18		
Sewage Treatment	Mt. Elgin Wastewater Treatment Plant discharges treated effluent to a septic field in Reynolds Creek watershed. All rural properties in the watershed are serviced by private septic systems.					
% Vegetation Cover and Types	Vegetation cover: Composition:	2,401 ha or 14.2% of the watershed 61% deciduous forest, 10% mixed forest, 4% plantation/coniferous forest, 21% meadow, 4% thicket				
Wetland Cover	7.6% (1,290 ha) of the watershed is in wetland cover. Environment Canada (2013) recommends at least 6% wetland cover. Approximately 7 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)	160	3	458	25	208
	Medium (10-30 ha)	44	16	691	38	
	Large (> 30 ha)	10	66	663	37	
Fish and Mussels	Fish Species: 32 including a new addition (Black Bullhead). Gamefish: Largemouth and Smallmouth Bass, Northern Pike, and Brook and Brown Trout. Mussel Species: 6.					
Species-at-Risk	Birds: 10 species including Bobolink and Wood Thrush. Mammals: American Badger. Reptiles: Snapping Turtle and Midland Painted 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 Reynolds Creek has declined since the last report card and scores an overall grade of D. Samples were taken at the provincial water quality monitoring station at Cromarty Drive. The UTRCA has a water quality target of a C grade for Reynolds Creek by 2037.

Total phosphorus levels have increased since 2017 to levels higher than the other 27 other subwatersheds in the Upper Thames River watershed.

*E. coli* bacteria levels have remained fairly steady since 2015 but remain high and indicate ongoing sources of human or animal waste. Nitrates (from sources such as fertilizer) remain above the provincial aquatic guideline. Chloride (mainly from road salt) and metals such as copper, lead, and zinc are at low levels that are well below aquatic life guidelines.

Benthic scores remained steady during this reporting period, and at a level slightly better than the Upper Thames River watershed average.

Indicators	Reynolds Creek					Upper Thames 2016-2020	Provincial Guideline	Indicator Description
	1996- 2000	2001- 2005	2006- 2010	2011- 2015	2016- 2020			
<b>Phosphorus (mg/l) *</b>	0.140 D	0.108 D	0.151 D	0.175 D	<b>0.244 F Declined</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>	762 D	682 D	567 D	429 D	<b>510 D 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>	6.49 D	6.44 D	5.87 D	5.75 D	<b>5.78 D 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.

Brown Trout are a European species found in Reynolds Creek. They tolerate warm temperatures and low oxygen levels better than other trout species, so they can live in a wider range of habitats and sometimes outcompete native species, particularly Brook Trout. Brown Trout are one of the most genetically diverse vertebrates.



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 Reynolds Creek watershed have remained fairly steady since the last report card and score an overall grade of D.

The percent forest cover (10.7%) has increased from 10.1% in the last report card primarily due to mapping improvements and boundary corrections. 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 another 3.5% for a total of 14.2% natural cover.

The percent forest interior (1.3%) is low, indicating most woodlots are too small or narrow to support area sensitive birds such as Scarlet Tanager and Ovenbird. The EC guideline is 10% forest interior.

The percent riparian zone forested (31.9%) has increased from 22.8% in the last report card. Levels are still below the EC guideline of 50%. Another 16% of the riparian zone is in permanent meadows and thickets for a total of 47.9% riparian zone vegetated.

Indicators	Reynolds 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	1.3 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	31.9 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

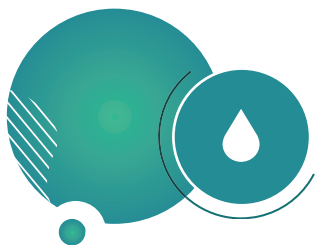
Years	ha	
2000-2006	22	Approximately 18 ha of forest were cleared and converted to other uses (e.g., urban, agriculture, aggregates) between the 2010 and 2015 air photography. An additional 29 ha of forest were cleared in the previous 10 years.
2006-2010	7	
2010-2015	18	

### Forest Area Gained

Years	ha	
2010-2015	25	New data shows that approximately 25 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

The municipal well in Mount Elgin draws groundwater from a bedrock aquifer and supplies approximately 600 people. Municipal well water is tested and treated.

## Private Wells

Approximately 700 private wells are on record in the Reynolds Creek watershed, drawing groundwater from both overburden and 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 2004, the UTRCA has monitored a Provincial Groundwater Monitoring Network well located just outside the Reynolds Creek watershed. It 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

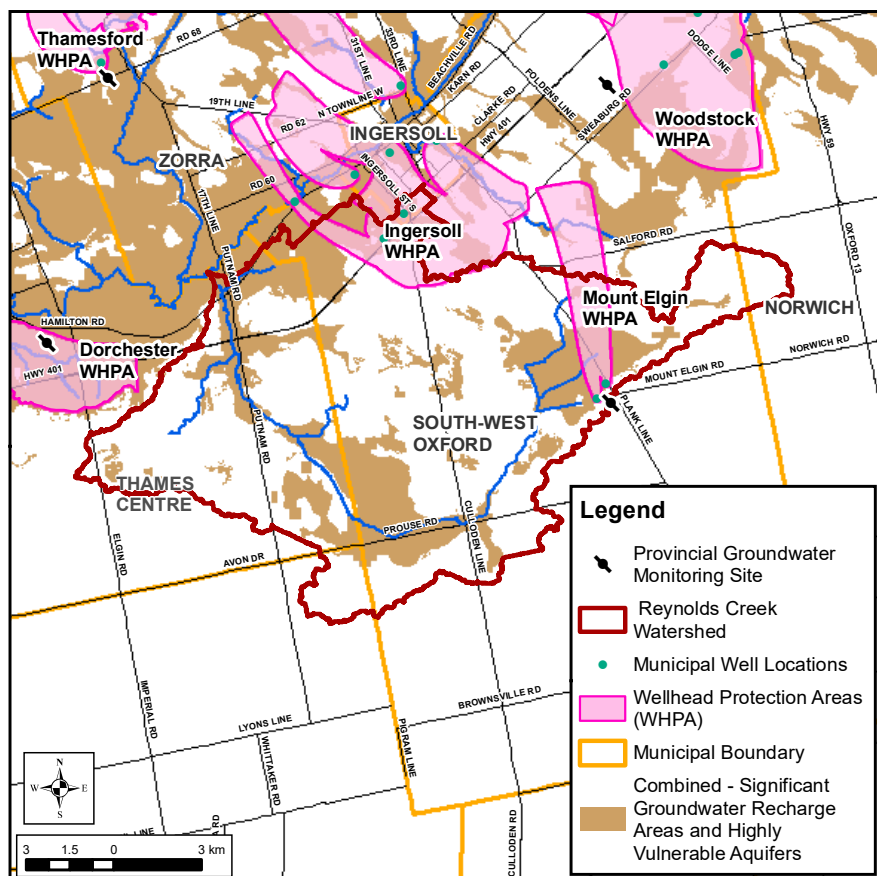
November and cooler temperatures in May. The rate of decline in groundwater levels is directly related to maximum air temperatures. Summer rainfall does not typically affect groundwater levels as evaporation and plant uptake greatly exceeds rainfall, and most rainfall is utilized by plants during summer.

### 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](http://www.sourcewaterprotection.on.ca) for information on groundwater resources, Source Protection Plan policies and the Water Supply System Summary for Mount Elgin.



## 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)
- Oxford Natural Heritage System Study (Oxford County, 2016 draft)
- Upper Thames River Source Protection Area Approved Assessment Report (Thames-Sydenham Source Protection Region, 2015)
- Middlesex Natural Heritage Systems Study (Middlesex County, 2014)

## 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.
- Implement soil conservation measures on highly erodible land. 26% of the Reynolds Creek watershed is highly erodible (the Upper Thames River average is 9%).
- Assess sources of high levels of bacteria and phosphorus in Reynolds Creek.
- 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.
- Adhere to Ontario's Cosmetic Pesticide Ban and utilize the municipal hazardous waste disposal program.
- 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)).



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



The UTRCA's Private Land Reforestation Program helps landowners create habitat, retire fragile agricultural land, plant windbreaks and treed buffer strips, and more.



## 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 and extend the existing riverside vegetation buffers along Reynolds Creek and its tributaries to create a continuous wildlife corridor.
- 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).
- Target land retirement and naturalization of highly erodible lands.
- 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 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](http://www.ontarioinvasiveplants.ca) and [www.thamesriver.on.ca](http://www.thamesriver.on.ca)). Keep out livestock and unauthorized motorized vehicles to protect habitat quality.

## Great Lakes Connection

The Reynolds Creek watershed is in the Thames River watershed, which is part of the Lake Erie watershed. Water from Reynolds Creek enters the South Thames River downstream of Ingersoll 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.





## Highlights of Progress Since 2017

The Reynolds 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 2018, UTRCA staff assisted watershed landowners in establishing eight new wetlands. In total, 4.5 hectares of marsh and swamp habitat were created and more than 30 ha of total land base was naturalized. The County of Oxford, Canada-Ontario Agreement, and Ontario Power Generation were the principal funders in these projects.
- Two recommendations from the Oxford Natural Heritage Study (Oxford County 2006) continue to be implemented. A Woodlands and Wetlands category was added to the Clean Water Program (CWP) to fund tree planting and other woodlot management projects, and a stewardship award is given annually to recognize commitment to the environment. In 2016, the County of Oxford established a wall of fame to recognize the winners of the Oxford Stewardship Award.
- Watershed landowners completed two CWP projects including fragile land retirement/reforestation. The CWP was initiated in 2001 as a partnership between local municipalities to fund environmental projects (see [www.cleanwaterprogram.ca](http://www.cleanwaterprogram.ca)).
- The Thames Talbot Land Trust's Five Points Forest Driedger Tract has been actively stewarded since its acquisition in 2010. Invasive species have been removed and trails established.
- On an Oxford County property near Salford, a Tree Migration study continues to look at the effects of climate change on trees. Bur Oak trees from Tennessee and Pennsylvania are being grown and compared to local stock. This trial is a partnership between the UTRCA, Forest Gene Conservation Association, and Stewardship Oxford. The non-local trees were first to set seed in 2021 and staff collected the acorns to be grown out in a nearby tree nursery.
- Many municipalities in the Upper Thames River watershed are taking action on climate change. For example, South-West Oxford has climate change adaptation requirements recognized through Oxford County's Future Oxford objectives, including a target of 100% renewable energy by 2050.
- Over 6,900 trees were planted at 16 sites through the UTRCA's Private Land Reforestation Program from 2016 to 2020.
- Fish sampling in the lower reaches of Reynolds Creek found a diverse community of 20 species including five warmwater gamefish and two coldwater indicators. Sampling in the one known coldwater tributary found that native Brook Trout are still present in the system along with a thriving Brown Trout population.



Brook Trout



Bur Oak



### 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:

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