



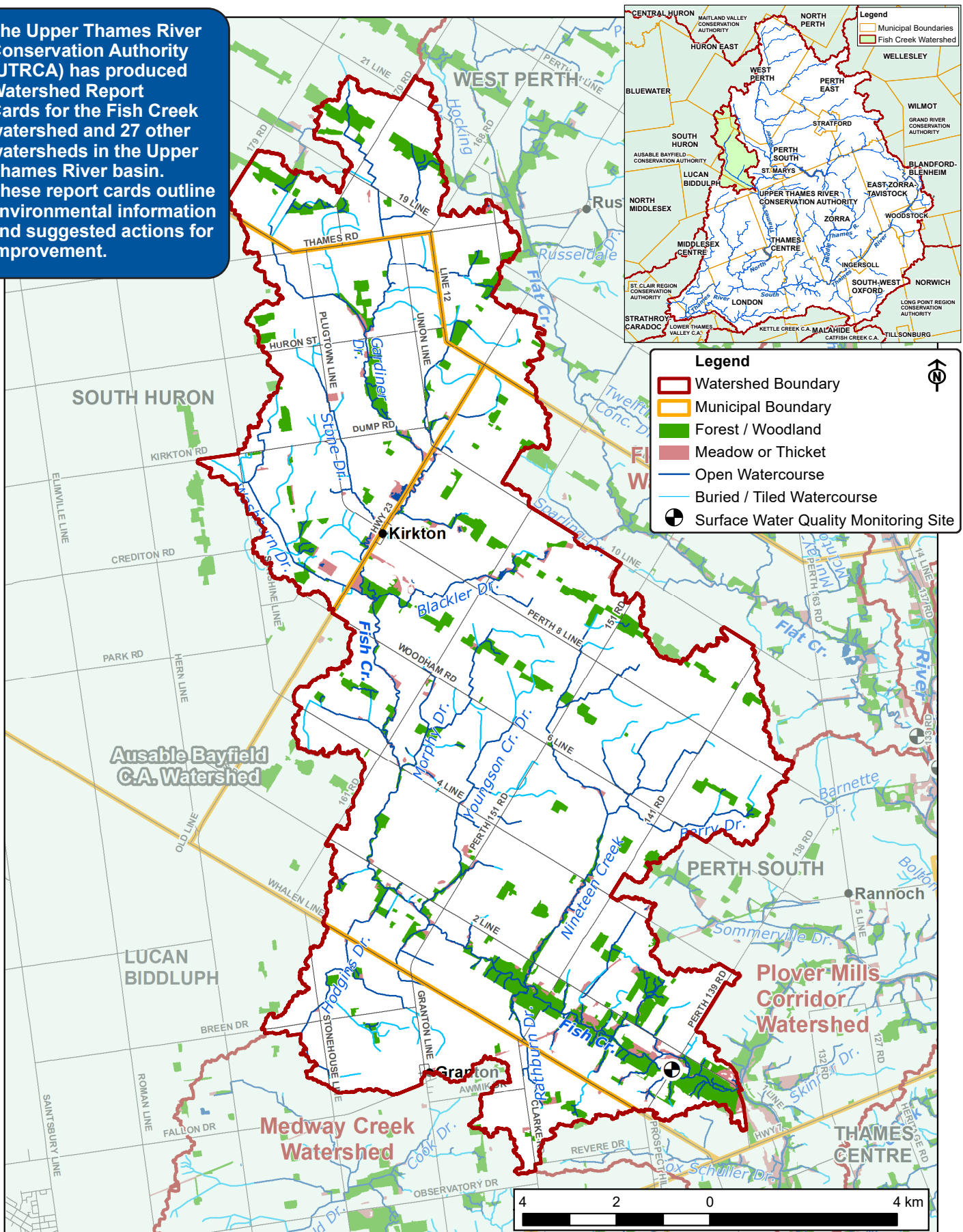
Surface Water Quality  
**D - Steady**

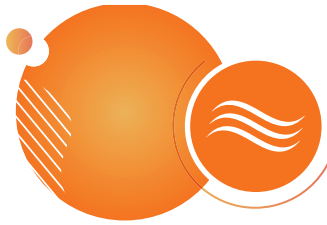


Forest Conditions  
**D - Steady**

# 2022 Watershed Report Card Fish Creek

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





# Watershed Features

Feature	Description																										
Municipalities	Perth South (61%, 91 km <sup>2</sup> ), South Huron (18%, 27 km <sup>2</sup> ), West Perth (11%, 16 km <sup>2</sup> ), Lucan-Biddulph (10%, 14 km <sup>2</sup> ). Total Area: 14,895 ha (149 km <sup>2</sup> ), 4% of Upper Thames River watershed.																										
Significant Natural Sites	Significant or Other Wetlands: None. Earth Science Areas of Natural and Scientific Interest: Prospect Hill Moraine Topography, Science Hill Hummocky Topography, Lucan Moraine																										
Land Cover	86% agriculture, 10% natural vegetation, < 1% open space, 31% urban, < 1% aggregates, < 1% water. There is 2% impervious cover (e.g., hard surfaces such as roofs and roads).																										
Population	1,355 in 2021; a 3% decrease since 2016																										
Soil Type	56% clay loam, 18% silty loam, 10% loam, 8% silty clay loam, 7% bottomland, 1% organic																										
Physiography	75% undrumlinized till plain, 16% spillway, 9% till moraine																										
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	69% of the watershed has agricultural field tile (21% random + 48% systematic), 3% urban drainage, 28% no tiling. There is 4% more tiling/drainage than five years ago.																										
Watercourse Characteristics	Total length: Watercourse type: Temperature: Main channel slope:	225 km of watercourses 28% natural, 42% channelized, 30% buried/closed 21% cool/coldwater, 79% warmwater/unconfirmed 0.18% slope (low/flat); range is 0.09-1.26% in Upper Thames River watersheds																									
Dams and Barriers	17 barriers to fish passage have been recorded in this watershed. Barriers include dams, weirs, perched culverts, beaver dams, stormwater ponds, etc.																										
Spills	<table><tr><td>2001-2005</td><td>2006-2010</td><td>2011-2015</td><td>2016-2020</td></tr><tr><td>2</td><td>7</td><td>1</td><td>2</td></tr></table>				2001-2005	2006-2010	2011-2015	2016-2020	2	7	1	2	Recent reported spills involved fuels, industrial chemicals, and manure.														
2001-2005	2006-2010	2011-2015	2016-2020																								
2	7	1	2																								
Sewage Treatment	There are no sewage treatment plants discharging into Fish Creek. Properties in the watershed are serviced by private septic systems.																										
% Vegetation Cover and Types	Vegetation cover: Composition:	1,487 ha or 10% of the Fish Creek watershed 61% deciduous forest, 13% mixed forest, 9% plantation/coniferous forest, 12% meadow, 2% thicket																									
Wetland Cover	2% (298 ha) of the watershed is in wetland cover. Environment Canada (2013) recommends at least 6% wetland cover. 1.3 ha of wetland cover was lost between 2010 and 2015.																										
Woodlot or Patch Size	<table><tr><th>Size Category</th><th>Number of Woodlots</th><th>Average Size (ha)</th><th>Total Woodland Area (ha)</th><th>% of Woodland Area</th><th>Largest Woodlot (ha)</th></tr><tr><td>Small (&lt; 10 ha)</td><td>116</td><td>3</td><td>343</td><td>28</td><td rowspan="3">208</td></tr><tr><td>Medium (10-30 ha)</td><td>36</td><td>16</td><td>373</td><td>30</td></tr><tr><td>Large (&gt; 30 ha)</td><td>19</td><td>73</td><td>510</td><td>42</td></tr></table>	Size Category	Number of Woodlots	Average Size (ha)	Total Woodland Area (ha)	% of Woodland Area	Largest Woodlot (ha)	Small (< 10 ha)	116	3	343	28	208	Medium (10-30 ha)	36	16	373	30	Large (> 30 ha)	19	73	510	42				
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Fish and Mussels	Fish Species: 39 Gamefish: Smallmouth and Largemouth Bass, Northern Pike Mussel Species: 13																										
Species-at-Risk	Birds: 8 species including Barn Swallow, Bobolink and Wood Thrush Fish: 3 species including Northern Sunfish Mussels: Rainbow and Wavy-rayed Lampmussel Reptiles: 3 species including Midland Painted Turtle, Spiny Softshell Turtle, and Snapping Turtle Plants: Butternut																										

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 has remained steady in Fish Creek since the last report card and scores an overall grade of D. In 2002, a water quality monitoring station was added to Fish Creek at Prospect Hill Road (see map). The UTRCA has a water quality target of a C grade for Fish Creek by 2037.

Phosphorus levels score a D, have been steady since 2015, and are better than the Upper Thames River average. Fecal bacteria (*E. coli*) levels have also remained steady since 2015 at relatively low levels compared to most of the

Upper Thames River subwatersheds. Nitrate levels (from sources such as fertilizer and waste) are steady and remain above the guideline for aquatic life. Chloride levels (mainly from road salt) have been increasing but remain below the aquatic guideline.

Stream health, or water quality as indicated by benthic monitoring, at the Prospect Hill Road site has remained steady with a score near the Upper Thames River average.

Indicators	Fish Creek					Upper Thames 2016-2020	Provincial Guideline	Indicator Description
	1996-2000	2001-2005	2006-2010	2011-2015	2016-2020			
<b>Phosphorus (mg/l) *</b>	No data	0.066 D	0.058 C	0.077 D	<b>0.103 D Steady</b>	0.110 D	0.030 B Aquatic Life	Phosphorus is found in products such as fertilizer, detergents, and waste, and contributes to excess algae and low oxygen in streams and lakes.
<b>Bacteria (CFU <i>E. coli</i> / 100 ml) **</b>	No data	386 D	130 C	163 C	<b>135 C Steady</b>	211 C	200 C Recreation	<i>E. coli</i> is a fecal coliform bacteria found in human and animal (livestock/wildlife/pets) waste. <i>E. coli</i> is a strong indicator of the potential to have other disease-causing organisms in the water.
<b>Benthic Score (FBI)</b>	6.28 D	6.15 D	6.42 D	5.91 D	<b>6.02 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 data. \*\*Geometric mean, City of 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.

The Hornyhead Chub, found in Fish Creek, has an interesting nesting behaviour. In spring, the male constructs a nest by moving pebbles and stones with its mouth and snout. The nests can be as large as 1 m wide and 15 cm high. Once a female has released eggs on the nest, the male will add additional stones for protection. Other females, and other species, may lay eggs in the same nest.



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 Fish Creek watershed have remained fairly steady since the last watershed report card in 2017, 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 (8.2%) is unchanged since the last report card. The Environment Canada (EC) guideline for sustaining species and water quality in southern Ontario is minimum 30% forest cover. Meadows and thickets add another 1.8% cover for a total of 10.0% natural vegetation cover.

The percent forest interior (0.9%) is very low, indicating most woodlots are too small and narrow to support area sensitive species such as Scarlet Tanager and Ovenbird. The EC guideline for forest interior in southern Ontario is 10% (B grade).

The percent riparian zone forested (31.5%) has increased from 23.5% in 2017, primarily due to improved mapping. Levels are still below the EC guideline of 50%. Additional riparian areas are in meadows and thickets (11.9%) for a total of 43.4% riparian zone vegetated.

Indicators	Fish Creek 2022*	Upper Thames Average 2022*	EC Guideline **	Indicator Description
% Forest Cover	8.2 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	0.9 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	31.5 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

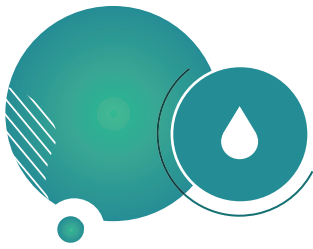
Years	ha	
2000-2006	7	Approximately 15 ha of forest were cleared and converted to other uses (e.g., urban, agriculture, aggregates) between the 2010 and 2015 air photography. An additional 14 ha of forest were cleared in the previous 10 years.
2006-2010	7	
2010-2015	15	

### Forest Area Gained

Years	ha	
2010-2015	23	New data shows that approximately 23 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

## Private Wells

Groundwater is the source of all drinking water in the Fish Creek watershed. Approximately 400 private wells are on record in this watershed, drawing from both 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 two Provincial Groundwater Monitoring Network wells in the Fish Creek watershed and two more were added in 2014. Data has shown groundwater levels generally decline from May to October, and increase (recharge) from late fall to early spring, with the largest increase in March (up to 1.5 m change). Recent data shows the recharge period 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.

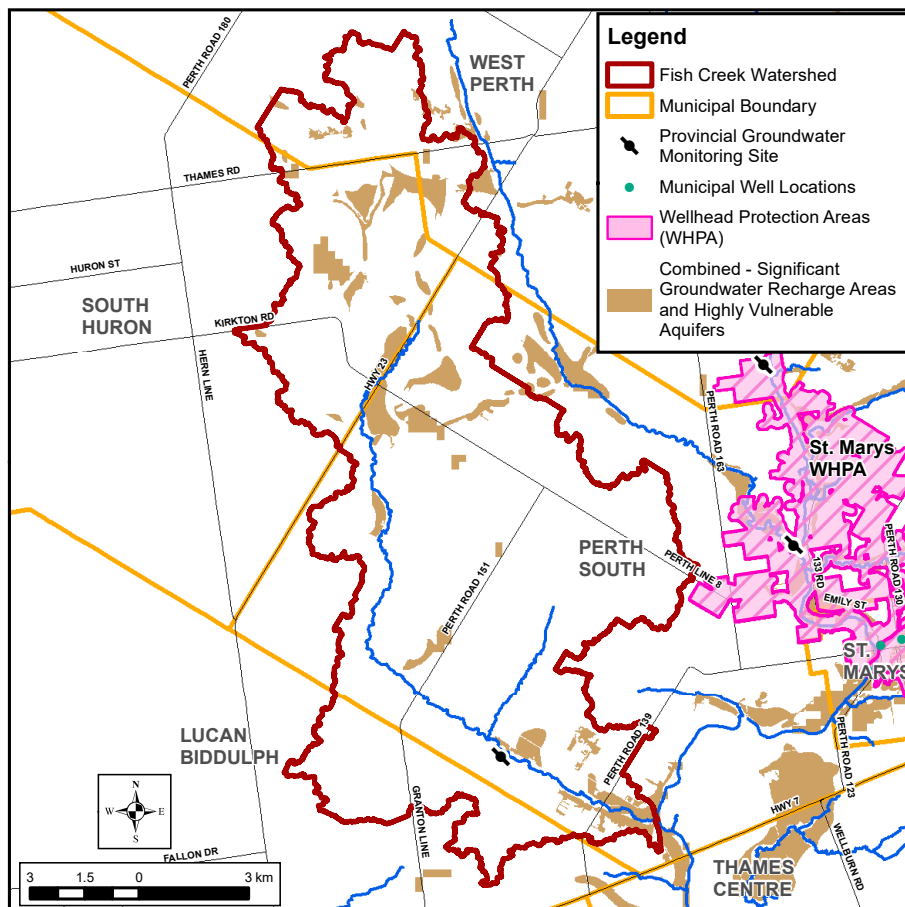
Summer rainfall does not typically affect groundwater levels as evaporation and plant uptake greatly exceeds rainfall, and most rainfall is utilized by plants during summer.

### 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.



## 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 Ziibi) Shared Waters Approach to Water Quality and Quantity (Thames River Clearwater Revival, 2019)
- Perth Natural Heritage Systems Study (Perth County, 2018 and 2019)
- Upper Thames River Source Protection Area Approved Assessment Report (Thames-Sydenham Source Protection Region, 2015)
- Recovery Strategy for the Thames River Aquatic Ecosystem (Thames River Recovery Team, 2005)

## 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.
- Target potential coldwater streams (e.g., Nineteen Creek) for rehabilitation.
- Address blockages (e.g., siltation problems, debris accumulation) in the lower reaches of Fish 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.
- Consider dam or barrier removal to improve stream health and fish passage, especially when a barrier no longer serves its intended purpose.
- Adhere to Ontario's Cosmetic Pesticide Ban and utilize the municipal hazardous waste disposal program.
- Continue to implement agricultural Best Management Practices (BMPs):
  - 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)).



Cover crops protect soil from erosion, prevent nutrient loss, and build soil health.



Trees and other permanent vegetation planted along watercourses improve water quality by filtering pollutants and providing shade to keep the water cool for fish.

## Local Actions to Improve Drinking Water

- Decommission abandoned wells according to Ministry of the Environment, Conservation, and Parks (MECP) 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 Conditions

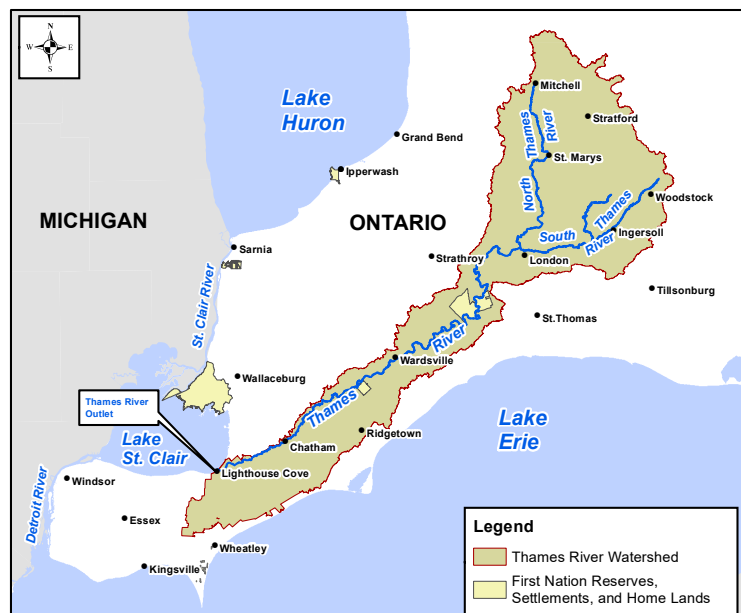
- Connect the existing riverside woodlands and meadows with additional plantings to create a continuous wildlife corridor along Fish Creek and its tributaries.
- For tree planting and naturalization projects, create a more natural and diverse habitat by using a variety of native plant species that are 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 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.
- Landowners 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

Fish Creek is in the Thames River watershed, which is part of the Lake Erie watershed. Water from Fish Creek enters the North Thames south of St. Marys, and takes 4-10 days to flow through London, 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 Fish 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 2020, UTRCA staff and volunteers planted 100 hardwood trees in the Kirkton-Woodham Conservation Area.
- Watershed landowners completed 17 Clean Water Program (CWP) projects including fragile land retirement, erosion control measures and clean water diversions. The CWP was initiated in 2001 as a partnership between local municipalities to fund environmental projects ([www.cleanwaterprogram.ca](http://www.cleanwaterprogram.ca)). From 2001 to 2020, 61 projects have been completed in this watershed.
- From 2016 to 2020, over 9300 trees were planted at 21 properties under the UTRCA's Private Land Reforestation Program with grants through Trees Ontario and the Clean Water Program.
- Many municipalities in the Upper Thames watershed are taking action on climate change. For Perth County municipalities, there is a shared Climate Change Coordinator. There is a commitment to reducing emissions and taking action on climate change by the Federation of Canadian Municipalities under the Partners for Climate Protection Program, a network of more than 350 Canadian municipal governments.
- A local collaborative continues to manage the Sawyer Preservation Woodlot, which is open to the public.
- The Perth Children's Water Festival was launched virtually in October 2021 due to the pandemic. The festival, which is normally a multi-day outdoor event, is a fun and educational way for students in grades 4 and 5 to learn about the important of water in their daily lives. The UTRCA and the Festival Organizing Committee hosted the event that ran once a month for 7 months.
- Perth County contracted the UTRCA to complete the Perth County Natural Heritage Systems Study (Perth County, 2018 and 2019) to identify existing important natural heritage features on the landscape.



Spiny Softshell turtles continue to be reported in the downstream section of Fish Creek. Bald Eagles have also been seen nesting in the same general area. The presence of these species-at-risk is good news for the watershed.



In 2021, the UTRCA and Perth South partnered in the delivery of a Tree Power program. The program offered native trees to residents to plant on their own properties to increase local tree cover.



### 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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**UPPER THAMES RIVER**  
CONSERVATION AUTHORITY



**Thames**  
Canadian Heritage River