



Water Monitoring 2020

UTRCA's long term water monitoring programs and research studies are well underway for 2020. A range of water monitoring is done to better understand stream health and pollution levels, to help guide implementation. The data is needed to measure progress toward environmental targets in the Upper Thames watershed including the five-year [Watershed Report Cards](#), with an upcoming report card to be completed in 2021.

Stream Water Quality

Staff monitor the 28 watersheds in the Upper Thames monthly for water chemistry and bacteria as part of the Ministry of Environment, Conservation, and Parks (MECP) Provincial Water Quality Monitoring Network. This monitoring program has run for 50 years and provides a good measure of long term pollutant levels and emerging issues. With the MECP laboratory currently closed due to COVID-19 restrictions, samples are being analyzed at a private lab. Winter sampling was completed at five sites to better understand high pollutant levels in runoff that increasingly occurs during winter months.

Groundwater

Spring groundwater testing was completed in March. The UTRCA has 28 monitoring wells in the Provincial Groundwater Monitoring Network (PGMN) where water levels are monitored

continuously. The data is used in-house for the Ontario Low Water Response Program. These wells are also monitored for water quality to understand emerging issues in local groundwater. The UTRCA has an additional 15 monitoring wells that are sampled for water quality, in partnership with the City of London. The water quality and quantity data is used for plan review and is available on the [PGMN website](#).

Benthic Invertebrates

Benthic invertebrates are monitored as an indicator of water and aquatic ecosystem quality. Staff will collect approximately 100 samples this year. Our first round of benthic monitoring was finished on May 28 with lower than normal water levels and flows early in the month. The sites included the 28 sites that contribute to Watershed Report Cards, and a set of reference (least impacted) sites. In September, samples will be collected at additional reference sites, as well as at sites where we are monitoring urban and rural development and remedial projects.

Reservoir Monitoring

Water quality staff monitor UTRCA reservoirs for dissolved oxygen and temperature conditions to help to inform reservoir management decisions. This data is particularly important during warm months when algae blooms can

occur, creating low oxygen conditions for fish. Bi-weekly monitoring is conducted through the summer and fall at Fanshawe, Wildwood, Pittock, Stratford, and Mitchell reservoirs.

Pesticide Monitoring

The UTRCA continues to monitor for pesticides as part of the MECP and Ministry of Agriculture, Food and Rural Affairs Pesticide Study, which started in 2004. This year, staff are monitoring three rural stream locations (Gregory, Otter, and Reynolds Creeks) from June to November to assess pesticide levels in these streams.

Dingman Creek Study

The UTRCA is currently under contract with the City of London to complete a three-year pilot monitoring program to measure environmental conditions. The program is part of the performance evaluation of the City's Dingman Creek Municipal Stormwater System-wide Environmental Compliance Approval.

Staff are taking monthly water samples year-round at 13 locations along the main branch of Dingman Creek. Benthic samples are collected and analyzed for the same 13 locations. Temperature loggers are installed to assess the thermal regime on Dingman tributaries and fish sampling will be conducted later in the summer to see how fish species captured relate to the temperatures recorded. The UTRCA is also establishing and maintaining additional flow gauging stations on the Dingman.

New Water Research Projects

A partnership with the local research team at Agriculture and Agri-food Canada began last year with a project to test area streams for the presence of veterinary and human pharmaceutical products. An initial sampling of all 28 watershed sites was completed, and monthly sampling of sediment and water is continuing this year at five locations. Continuous passive samplers are also installed in two locations.

Two new studies are in the works. We are fortunate to partner on project proposals with

Western University for research in two areas: a study on chloride/road salt impacts on surface water, groundwater, and aquatic life; and a study to understand the level of plastics in the Thames River system, including training a new generation of science graduates on plastics in the environment and monitoring techniques. *Contact: Karen Maaskant, Water Quality Specialist, or Michelle Fletcher, Aquatic Biologist*

Expanding On-Farm Phosphorus Research

Since the announcement of the On-Farm Applied Research and Monitoring (ONFARM) project in December, staff have been planning for a new edge-of-field monitoring station. In May, the shovels finally hit the ground to modify



The farm-owner and cooperator inspects the installation of the new tile-monitoring unit.



A shed, built directly over the tile-monitoring structure, houses the sampling equipment.

the cooperator's farm tile drainage system and add a riser structure for monitoring access.

This site will be a comparative study where the farmer will plant cover crops each year on only one half of the field. The split-monitoring design will allow us to measure the impact of this conservation practice on nutrient losses from the field. This edge-of-field study complements the larger-scale cover crop project already underway in the Upper Medway Creek subwatershed.

After monitoring equipment is installed, staff will collect data and samples from this farm from each runoff event until spring 2023.

Contact: Michael Funk

Thames Valley Science & Engineering Fair - Conservation Award

In May, UTRCA staff helped judge the Thames Valley Science & Engineering Fair, held online due to COVID-19. This year's fair was a great success with 78 projects from 95 students who were able to modify their projects to make them available for online judging.

UTRCA staff judged and awarded the Conservation Award to the Junior Division (grade 6-8) project that best explores conservation with a local focus. This year's award winner was Luciana Tudor from Orchard Park Public School. Her project, titled "Well, that went downhill quickly," tested different erosion and landslide prevention methods, including the use of plants and netting. Luciana received a pair of binoculars and the Conservation Award Plaque, which will be displayed at her school for the next year.

Contact: Alexis Stupich, Community Education Specialist

Stoney Creek Pollinator Garden

The Friends of Stoney Creek are excited to start work on a new pollinator garden in their subwatershed, with funding from the City of London's Neighbourhood Decision Making Program. The plan was to complete the project in the spring with school groups and community members but, due to the pandemic, we have



Tarps are used to kill off the turf in the new garden plot.

postponed planting the garden until the spring of 2021.

While it's disappointing not to plant the garden yet, the delay gives more time for site preparation. We acquired second hand tarps and are using them to kill the turf/grass in the new garden plot. This will allow the wildflower plugs and seeds a better opportunity to thrive once planted next spring. Signs have been posted in the area explaining this chemical free method of site preparation.

This great project is a silver lining of the pandemic and something for the neighbours to look forward to next spring.

Contact: Linda Smith, Community Partnership Specialist



Invasive Species Control at Sparling Bush

Sparling Bush is a 2.4 hectare mature sugar maple woodlot located within the Town of St. Marys. In 2014, the UTRCA was approached by the municipality to review and make recommendations on how best to manage Sparling Bush. This request came as a result of concern about the woodlot's overall health and management. In 2015, the UTRCA completed a report titled "Sparling Bush: Management Recommendations for the Town of St. Marys." The report identified encroachment and the spread of non-native invasive species as two of the main threats to this otherwise healthy woodlot. The main invasive species in Sparling Bush are dog-strangling vine, common periwinkle, garlic mustard, and buckthorn.



Public Works and UTRCA installed filter cloth on the edge of the bush.

UTRCA staff have continued to work with Town staff to develop and implement a plan to [control invasive species](#) in the woodlot. The Town developed the Sparling Bush Plan (2020-2022), which identified four strategic priorities: encroachment, non-native invasive species, trail and tree management, and signage. The strategic priorities were based on the recommendations from the 2015 report.

UTRCA staff (Jay Ebel, Brandon Williamson, Vanni Azzano, and Erin Dolmage), with assistance from the Town of St. Marys Public Works staff, recently started the non-native invasive species strategic priority of the Sparling Bush Plan. Filter cloth was installed along the west and south



UTRCA staff spread mulch on the filter cloth. perimeter of the bush and a layer of mulch placed on top to control the spread of the dog-strangling vine. The same method was applied to larger sections of dog-strangling vine and common periwinkle within the bush. The area will continue to be monitored to assess the results of the project.

Contact: Vanni Azzano, Community Education Supervisor

Enbridge Funding For Indigenous Programming

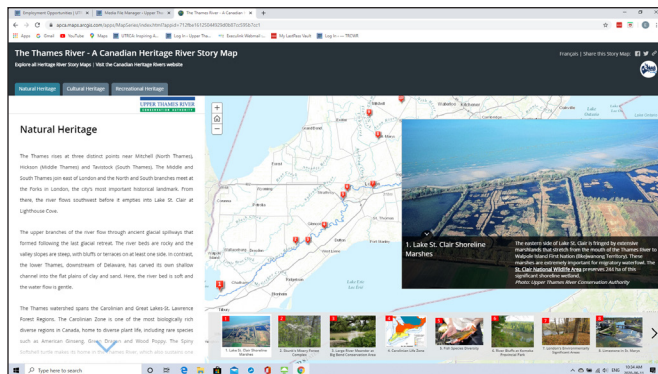
The Community Education Unit is pleased to announce that we've received \$2,000 in funding from Enbridge Gas to develop Indigenous programming and resources for schools in our watershed. The Environmental Education Centres at the UTRCA currently lack comprehensive, curriculum-linked Indigenous programs. Over the course of the next year, the education team will develop the new Indigenous programming by identifying appropriate curriculum links, researching and reviewing local Indigenous history, developing hands-on educational activities, and creating pre- and post- field trip resource packages for teachers. We also hope to connect with our local Indigenous communities so they can provide input and help guide program development. The plan is to offer the Indigenous programming at our Environmental Education Centres beginning next spring.

Enbridge Gas supports organizations that help create vibrant and stronger communities. They

focus their donations around areas of safety, environment, and community.

Contact: Karlee Flear, Community Education Supervisor

Thames Profiled on New CHRS Story Map!



The [Canadian Heritage Rivers System \(CHRS\)](#) launched their updated website in June with a new interactive Story Map feature that provides the perfect opportunity to explore the natural, cultural and recreational heritage of the Thames and many other heritage rivers.

As heritage river managers for the Thames, UTRCA staff completed a contract with CHRS/ Parks Canada to submit 32 features of cultural, natural and recreational significance across the watershed. Each feature is represented by a photo, caption and a short paragraph with external links, all referenced on a map of the watershed.

The CHRS worked with its other river managers, provincial and territorial partners to develop this virtual, interactive story map (based on an ArcGIS platform) to educate and inspire Canadians about their rivers.

The launch of this website feature coincides with the 20th anniversary of the designation of the Thames as a Canadian Heritage River. Take a [virtual visit to the Thames River](#) from the comfort of your home. Explore stories from other nearby heritage rivers such as the Grand and Detroit, as well as those farther away including the French, Rideau, Upper Restigouche, North Saskatchewan, Bloodvein, and Athabasca.

Cathy Quinlan, Terrestrial Biologist

Tree & Shrub Pandemic

Over the past couple of months, UTRCA forestry staff have received many inquiries about two tree and shrub pests whose populations have exploded in various parts of the watershed:

[European gypsy moth](#) and [euonymus webworm](#).

Both of these species are considered non native, and gypsy moth is a more serious problem.

European Gypsy Moth

The gypsy moth was first introduced from Europe into Massachusetts in 1869 by a French naturalist who was trying to cross them with North American silkworms for silk production. From there, the gypsy moth has spread across North America. The species was first detected in Ontario in 1969.



The gypsy moth caterpillar has five pairs of blue dots and six pairs of red dots along its back.

Last year, there were gypsy moth hot spots across our watershed. The population seems much more wide spread this year and, if history holds, next year may be even worse, as the population often follows a three year cycle before collapsing. Monitoring gypsy moth egg masses this fall will provide an indication of what can be expected in 2021.

A mature gypsy moth caterpillar can be identified by looking at its back, which has five pairs of blue dots followed by six pairs of red dots. Mature caterpillars are approximately 6 cm in length. When populations are high, the

sound of frass (caterpillar droppings) can be heard raining down from trees above. Gypsy moth caterpillars will feed mainly on deciduous species. Some of their favourites are oak, maple, birch and serviceberry. Young caterpillars will hang from trees on threads and can be dispersed great distances by the wind.



Female gypsy moths are white and flightless; the males are brown and can fly. The yellowish egg masses will remain on the tree bark until next spring.

When the caterpillars are young they feed at all times of the day, but as they mature they come down from the tree's crown seeking shade during the heat of the day. At this stage, homeowners can trap the caterpillars by providing shade. To make a trap, wrap a strip of burlap approximately 45 cm (17 inches) wide around the tree trunk at chest height. Tie a string around the centre of the burlap and fold the upper portion down to form a skirt, with the string acting as a belt. The caterpillars will crawl under the burlap to escape the sun and become trapped. Later in the day, lift the burlap, pick off the caterpillars, and dispose of them.

Defoliation in successive years can be very stressful on trees making them susceptible to other stressors.

Euonymus Webworm

Euonymus webworm was first reported near Guelph in 1976 and was probably introduced on plant material. Since then, the population has had its ups and down. This year there appears

to be a very localized high population in the Ingersoll and Thamesford area.

This pest is not considered as serious as gypsy moth, it feeds mainly on small shrubs, in particular non-native euonymus species. While not as serious, the mass webbing that encompasses complete shrubs is very impressive and looks like something out of a horror movie. The larvae that feed within the webbing are yellow, with black head and a series of black dots down their backs. The larvae mature at about 2.5 cm in length. Hundreds of larvae within the webbing will completely strip the shrub's foliage.



Euonymus webworm caterpillars (above) spin webbing that can envelope entire shrubs (below).



Both gypsy moth and euonymus webworm can be controlled in the early stages with a biological insecticide called *Bacillus thuringiensis kurstaki* (Btk). To be effective, the Btk must be applied to the foliage when the larvae first begin feeding. As the larvae mature, the Btk is no longer effective. We are currently beyond the stage where Btk would be effective.

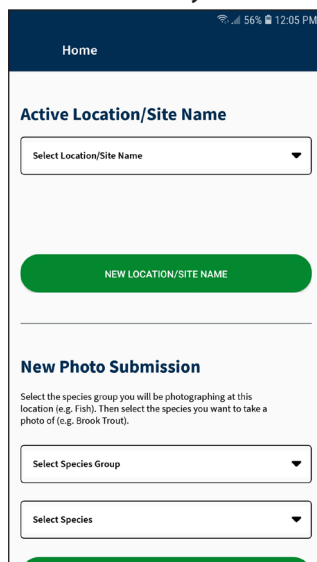
Contact: John Enright, Forester

There's an App for That!

A last minute opportunity to access some Fisheries and Oceans Canada (DFO) funding came available early in 2020. The UTRCA's Conservation Services and Watershed Planning, Research and Monitoring units worked together to develop the successful proposal. The challenge was that the project needed to be completed by March 31, 2020, but staff are often prepared with shovel-ready projects!

The project focussed on two areas: the development of a Species at Risk Inventory app (for Android devices); and the establishment of 700 acres of cover crops in the Medway Creek watershed.

UTRCA biology staff enlisted and worked with RhinoActive app to help develop and subsequently create a photo labelling Android app for Ontario freshwater fishes. A fully functional app has been completed and is currently being tested by UTRCA and DFO staff. The app allows the user to label photos with a user generated location and a pick list of Ontario freshwater fishes, with the appropriate photo views for those fish from the 2018 Drain Class Protocol. The app will be available to DFO for distribution.



The cover crop component of the project was also a big success. Seven landowners showed immediate interest in taking part, resulting in more than 700 acres on 11 different farm parcels across the Medway Creek watershed. It has been shown that cover crops that are established in the fall and maintained until the spring, when the next season's crop is planted, can reduce soil erosion by 60%. The reduction in sediment and nutrient inputs into Medway Creek is directly reflected in improved water quality. The project also gives other landowners the opportunity



to observe project results and the information will assist in expanding cover crop uptake in subsequent years. A sign has been placed at each site acknowledging DFO.

Contact: Brad Glasman, Manager, Conservation Services

Seeding the Butternut's Future



On May 27, an additional [83 butternut](#) trees were planted at the Southern Ontario Butternut Seed Orchard (SOBSO) just south of Innerkip. Planting was carried out by staff from Community Education and Conservation Services units. This brings our total butternut planted to 260.

The SOBSO is one of four seed orchards located across the province to protect the genetics of the endangered butternut. Butternut across is begin threatened its native range by butternut canker, for which there is no known cure.

The butternut selected for archiving appear to have some tolerance to the canker, and have been DNA tested to ensure they are pure. Butternut will hybridize with both Japanese and English walnut. Once selected, the DNA-tested butternut are grafted onto black walnut rootstock at the Ferguson Forest Centre in Kemptville, Ontario. Black walnut is used because we know it will not carry the canker. Seeds can carry the canker and with seed you never know if it is pure. After grafting, the butternut are maintained in the nursery for two years before being shipped out to one of the four seed orchards for planting.



Although these grafted butternut appear young, physiologically they are mature and will start to produce seed within five years from being planted out. Seed will then be collected and shipped to Somerville Seedlings to be grown into seedlings. It is hoped that within a few years, these genetically canker tolerant seedlings will be available to incorporate into our private land reforestation program.

The butternut recovery program is being managed and funded by Forest Gene Conservation Association.

Contact: John Enright, Forester

Slag Filter Phosphorus Reduction Project Update

The UTRCA, in collaboration with Bluewater Pipe Inc. and McCutcheon Farm Drainage, is testing the [feasibility and practicality of using slag](#), which is leftover material from metal refining, to filter water from agricultural field tiles. The [project goal is to reduce phosphorus loadings](#) into local streams and rivers.



UTRCA's Mike Funk pours pails of slag mixture into the fabric bag before it is lowered into the catchbasin system installed on a farm in the upper Medway watershed.

The unique design called for large fabric bags to be filled with a mixture of 50% slag and 50% washed 5/8" round stone and placed in specially designed 600 mm diameter and 900 mm diameter filter chambers. The units contain 600 lbs and 1200 lbs of slag mix, respectively.

Runoff from field tiles will be intercepted by the filters before it enters the stream. Water samples will be collected before and after the filter system to see what impact the slag has on reducing nutrients reaching the stream. The slag mixture has been approved by government as a low-risk substance. The project is funded by the Thames River Phosphorus Reduction Collaborative.
Contact: Craig Merkley, Conservation Services Specialist

Clean Water Program Update

Although the spring of 2020 has not seen damaging storm runoff events, the lessons from previous years have not been forgotten. A 150 acre farm near Lucan has taken the step of installing a series of broadbased terraces to help control past erosion damage. The system was designed by UTRCA Conservation Services Unit staff, who have designed similar structures for the landowner on other farms.

The structures will work as part of a larger management package that includes cropping rotations and tillage considerations to improve soil structure.

The project was partially funded by the local [Clean Water Program](#) which is available to landowners in the watershed and supported by local municipalities.

Contact: Craig Merkley, Conservation Services Specialist



A network of broadbased terraces constructed with stone blind inlets is installed on a farm near Lucan. The work is partially funded by the local CWP.