TAY RIVER
Subwatershed Report
2017

A report on the environmental health of the Tay Watershed

RIDEAU VALLEY CONSERVATION AUTHORITY

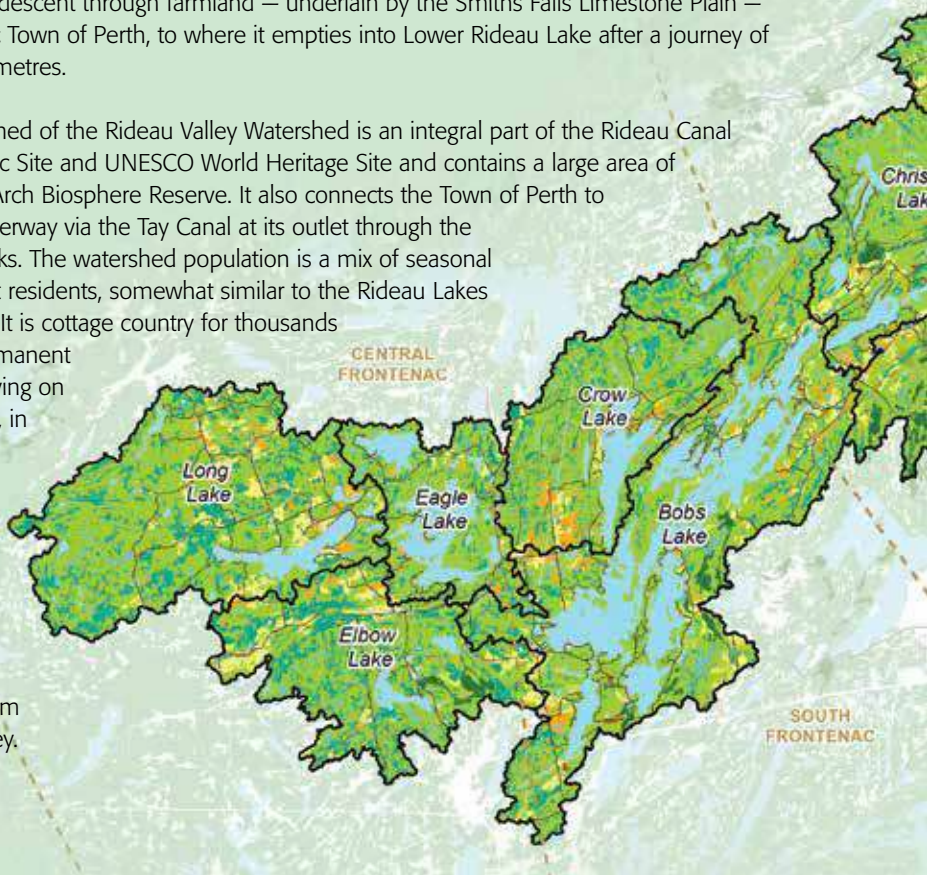
Conservation ONTARIO
Natural Champions

Welcome to the
Tay River Subwatershed

A watershed is an area of land that drains to a river, lake or stream. In the large watershed of Eastern Ontario's Rideau River, there are six major subwatersheds — Jock River, Kemptville Creek, Lower Rideau, Middle Rideau, Rideau Lakes and Tay River — which are further divided into 66 smaller drainage areas referred to as catchments.

This report is a snapshot of the Tay River Subwatershed — locally known as the Tay Watershed — which begins its journey in the headwaters of Carnahan, Leggat and Scanlin Lakes, nestled in the Frontenac Axis. From there it meanders northeast, draining water from 55 lakes into Lower Rideau Lake at Port Elmsley. Along its way, the Tay flows through a land of small and large lakes, often encircled by granite of the Canadian Shield that defines many of them, including Long, Eagle, Crow and Bobs Lakes. From here, the Tay takes on a more river-like form as it flows towards Christie Lake. Out of Christie, the river passes through the various old dams and spillways built to power small mills along the Tay River, all of which are now abandoned. At this point, the Tay begins its long descent through farmland — underlain by the Smiths Falls Limestone Plain — and the historic Town of Perth, to where it empties into Lower Rideau Lake after a journey of about 100 kilometres.

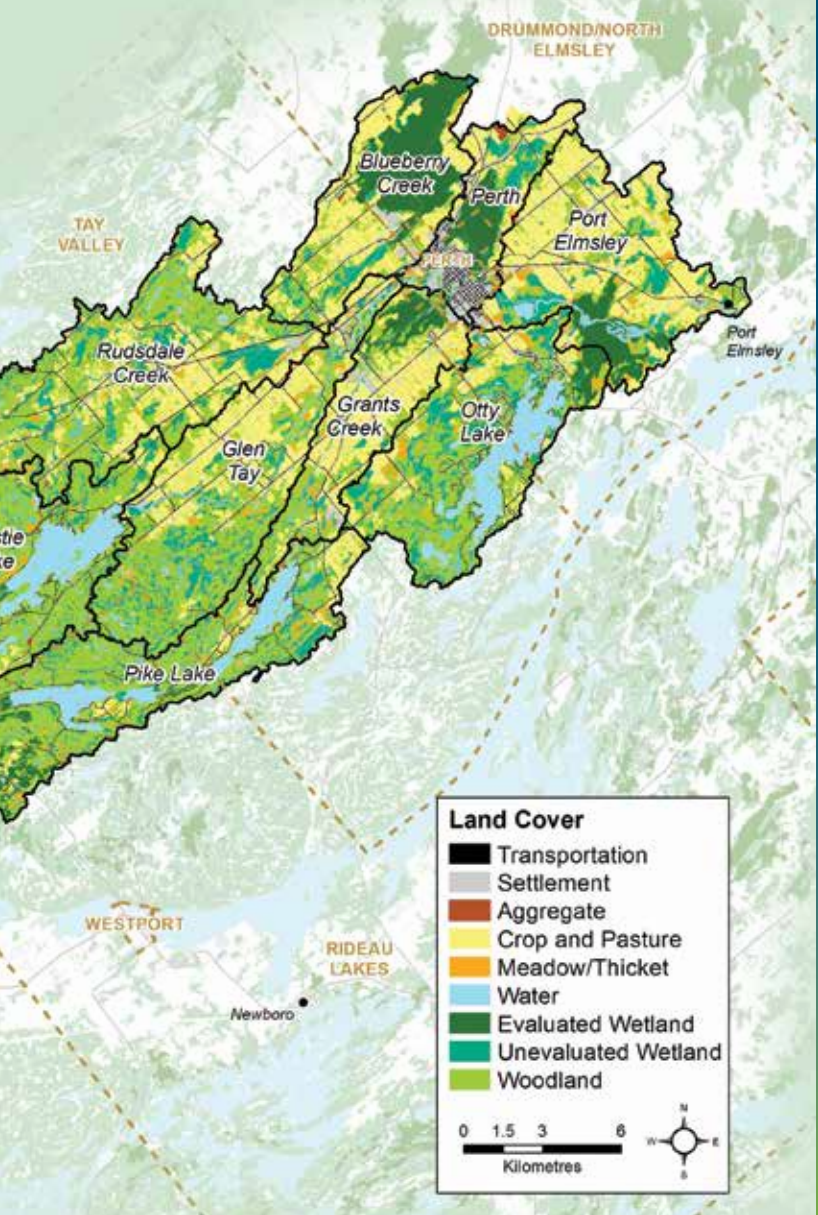
This subwatershed of the Rideau Valley Watershed is an integral part of the Rideau Canal National Historic Site and UNESCO World Heritage Site and contains a large area of the Frontenac Arch Biosphere Reserve. It also connects the Town of Perth to the Rideau Waterway via the Tay Canal at its outlet through the Beveridges Locks. The watershed population is a mix of seasonal and permanent residents, somewhat similar to the Rideau Lakes Subwatershed. It is cottage country for thousands of families. Permanent residents are living on rural properties, in country estate subdivisions, on lakeside residential lots or in hamlets and villages such as Bolingbroke, Glen Tay, Parham and Port Elmsley.



What We Monitor and Why?

The RVCA's goal is for clean water, healthy shorelines and sustainable land use. Monitoring environmental conditions helps us see trends over time, focus our actions where they can do the most good and evaluate the effectiveness of our watershed policies and programs.

This report, together with more detailed catchment reports prepared for each of the 14 catchments of the Tay River Subwatershed (available at https://watersheds.rvca.ca), show conditions using the most up-to-date data available for four key indicators of subwatershed health: forest cover, wetlands, shoreline vegetation and surface water quality. This document also highlights any changes and trends since the release of the *Tay River Subwatershed Report 2011.*



Length of River
41 km

Length of Tributaries
1,732 km

Wetland Area
153 km²

Lake Shoreline
739 km

Catchment Areas

- Blueberry Creek – 39 km²
- Bobs Lake – 132 km²
- Christie Lake – 65 km²
- Crow Lake – 51 km²
- Eagle Lake – 34 km²
- Elbow Lake – 56 km²
- Glen Tay – 56 km²
- Grants Creek – 31 km²
- Long Lake – 86 km²
- Otty Lake – 53 km²
- Perth – 21 km²
- Pike Lake – 63 km²
- Port Elmsley – 51 km²
- Rudsdale Creek – 62 km²

Total Drainage Area
800 km²

RVCA and RVCF* Conservation Lands

- Bard – 80.97 ha
- Haire – 0.40 ha
- McAlpine – 0.07 ha
- McEwen – 79.97 ha
- Medley-Roziland Island – 1.21 ha
- Meisel Woods – 50.70 ha
- Mica Mines – 442.27 ha
- Perth Wildlife Reserve – 235.97 ha
- Wiseman – 6.88 ha

Total RVCA and RVCF* Conservation Lands
898.44 ha

* Rideau Valley Conservation Foundation

Forests

The Benefits of Forests

Forests are important parts of a healthy watershed because of their role in the hydrological cycle. Runoff after rain or snowmelt from an area of forested land is significantly less in both its volume and peak flow rate than run off from a similar area that has been cleared or urbanized. Trees make subwatersheds more resilient to climate change's heavy rainfall, irregular storms and unseasonal precipitation. Forests also provide habitat for many plants and animals. They also clean the air and reduce erosion along riparian areas.

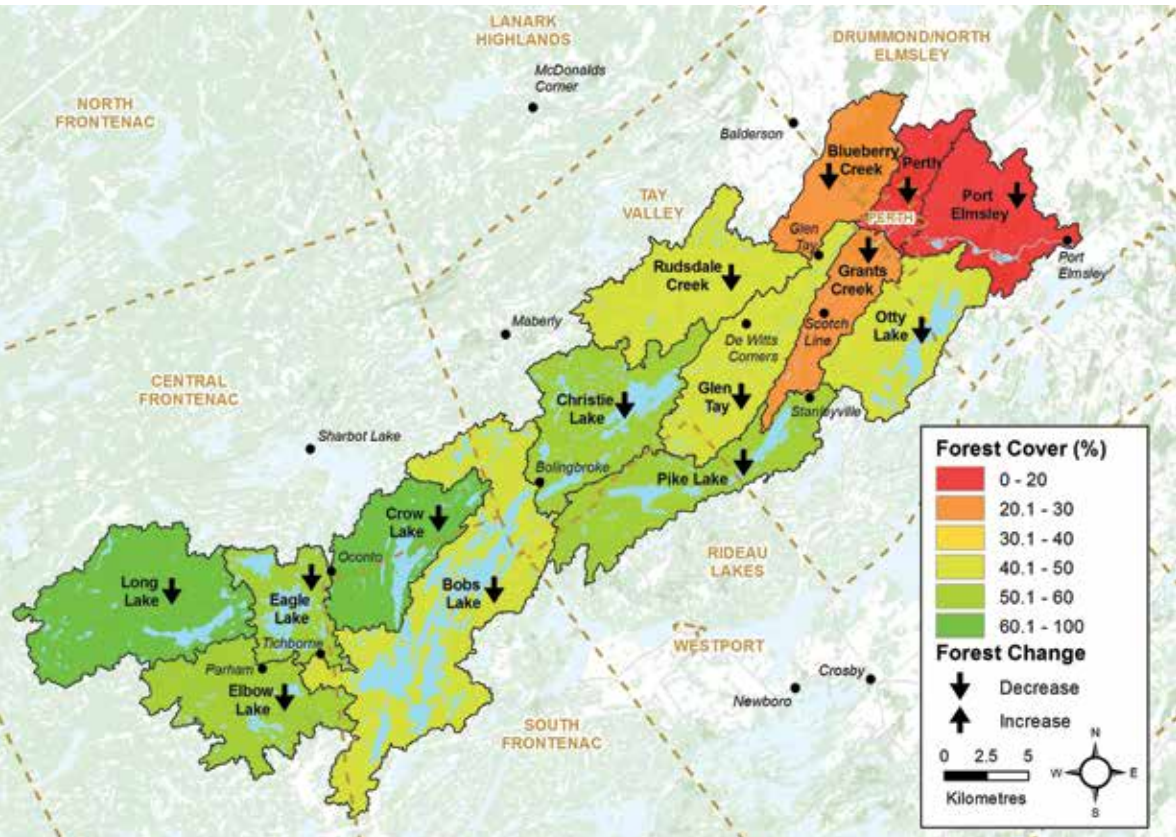
Experts believe a minimum forest cover of 30 percent is needed to sustain the natural biodiversity and environmental services forests provide.[1]

Forests in the Tay River Subwatershed

Forest cover in the Tay was classified using 2008 and 2014 colour aerial photography. Results from 2008 and 2014 show that forest cover remains largely unchanged in the subwatershed at 47 percent with a decrease of 85 hectares over six years.

Across the Tay, forest cover ranges from a high of 61 percent in the Long and Crow Lake Catchments to a low of 15 percent in the Perth Catchment. Six catchments contain 50 percent or more forest cover that is likely to support most of the potential species found in the Tay River Subwatershed, and healthy aquatic systems.[1] Another four catchments have 40 percent or more forest cover that is likely to support more than one half of the potential

[1] Environment Canada. 2013. *How Much Habitat is Enough?* Third Edition. Environment Canada. Toronto, Ontario.



species richness and moderately healthy aquatic systems. The remaining four catchments contain less than the recommended 30 percent minimum[1] forest cover, which suggests that in those areas, we are in a high-risk state where the forests may only support less than one half of the potential species richness and contribute moderately to the health of the aquatic system.[1]

All 14 Tay catchments have seen a slight decrease in forest cover (between one and 19 hectares) between 2008 and 2014, most of which can be attributed to anthropogenic activity (conversion of woodland to crop and pastureland and settlement) and natural processes (succession of woodland to wetland). Forest cover results and change are shown in the accompanying table and map.

Going forward, efforts should be made to support reforestation and protect what remains in all catchments, but with a focus on those catchments — Blueberry, Grants Creek, Perth and Port Elmsley — which have forest cover below the 30 percent minimum guideline.

Forest Cover by Catchment

Catchment	Forest Cover in 2014	Forest Cover Change Since 2008	
Blueberry Creek	25.0%	-0.14%	-5.57 ha
Bobs Lake	49.9%	-0.15%	-19.33 ha
Christie Lake	57.1%	-0.03%	-2.06 ha
Crow Lake	60.7%	-0.10%	-5.29 ha
Eagle Lake	52.4%	-0.02%	-0.66 ha
Elbow Lake	55.8%	-0.10%	-5.63 ha
Glen Tay	46.1%	-0.26%	-14.22 ha
Grants Creek	27.9%	-0.28%	-8.79 ha
Long Lake	61.4%	-0.03%	-2.38 ha
Otty Lake	41.2%	-0.13%	-7.11 ha
Perth	14.5%	-0.32%	-6.93 ha
Pike Lake	52.5%	-0.06%	-3.69 ha
Port Elmsley	20.0%	-0.01%	-0.39 ha
Rudsdale Creek	47.6%	-0.05%	-3.14 ha
Subwatershed Average	**47.2%**	**-0.11%**	**-85.19 ha**

Wetlands

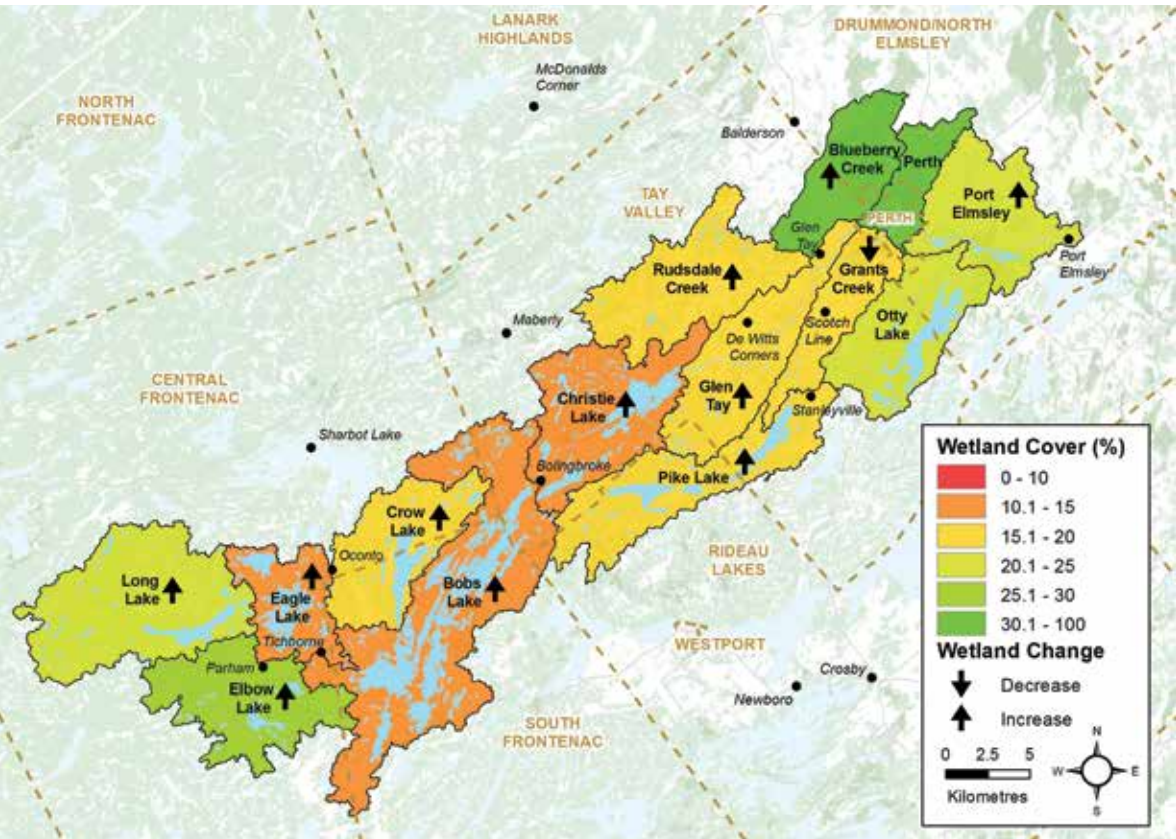
The Benefits of Wetlands

Wetlands are nature's flood control and water supply reservoirs — places for the temporary storage of runoff from rain and snowmelt. Thanks to wetlands, peak flows during floods are lower, low flows are sustained during dry weather and groundwater supplies are replenished. Wetlands provide habitat for many common and rare plants and animals as well as fishing, hunting and recreational opportunities.

RVCA hydrologists estimate that the existing wetlands across the Rideau Watershed are responsible for a peak flow (and its resulting flood damage) that is about 10 percent lower than what we would see without wetlands! This flood control function is significant, natural and free. Wetlands are also recognized for the many significant ecological goods and services they provide such as water supply, waste water treatment, climate regulation as well as flood control. These services have been valued at $247 per person per year in a recent Ontario Study. In other words, wetlands do for free what we would otherwise have to pay millions of dollars to do through technology and infrastructure. In the long term, sustained water supplies and effective flood damage reduction will depend, in large part, on maintaining the remaining wetland features throughout the watershed and restoring them in those areas of the Rideau Watershed that are more prone to the impacts of a changing climate (i.e., poorer water quality conditions, stressed water supplies, increased flooding and erosion, reduced biodiversity).

Wetlands in the Tay River Subwatershed

The combination of geological setting, topography, climate and resulting high water table have helped create the many smaller



wetlands so common on the Canadian Shield along with the larger wetlands that are such an important and distinctive feature of off-Shield areas of the Tay.

Wetland cover in the Tay was classified using the 2008 and 2014 colour aerial photography. Results from 2008 and 2014 show that wetland cover remains largely unchanged at 19 percent (or 153 km^2) with an increase of 50 hectares observed between these years.

Across the Tay, wetland cover ranges from a high of 40 percent in the Blueberry Creek Catchment to a low of 13 percent in the Eagle Lake Catchment. Since 2008, 11 catchments have seen a slight increase in wetland cover with another one experiencing a slight decrease (due to anthropogenic activity and natural processes); two catchments remain unchanged over the six-year period. Wetland cover results and change are shown in the accompanying table and map.

Wetland Cover by Catchment

Catchment	Wetland Cover in 2014	Wetland Cover Change Since 2008	
Blueberry Creek	39.9%	0.03%	0.99 ha
Bobs Lake	13.6%	0.11%	14.94 ha
Christie Lake	13.8%	0.01%	0.90 ha
Crow Lake	17.6%	0.09%	4.61 ha
Eagle Lake	12.8%	0.02%	0.62 ha
Elbow Lake	27.4%	0.05%	2.80 ha
Glen Tay	15.2%	0.12%	6.63 ha
Grants Creek	15.7%	-0.04%	-1.13 ha
Long Lake	21.3%	0.01%	0.43 ha
Otty Lake	21.0%	0.00%	0.00 ha
Perth	31.9%	0.00%	0.00 ha
Pike Lake	19.5%	0.07%	4.37 ha
Port Elmsley	20.3%	0.23%	11.74 ha
Rudsdale Creek	16.1%	0.04%	2.68 ha
Subwatershed Average	**19.2%**	**0.06%**	**49.57 ha**

While recent wetland cover is largely unchanged, the loss of wetlands since pre-settlement times varies across the subwatershed. Where data is available in the Tay, it has been determined that the greatest loss of historical wetland area has occurred in the Port Elmsley Catchment (at 13 km^2), followed by the Blueberry and Rudsdale Creek Catchments (at 10 km^2), the Glen Tay Catchment (at 8 km^2), the Grants Creek Catchment (at 6 km^2) and the Perth and Otty Lake Catchments (at 5 km^2). Most of this historical loss of wetland has occurred in the off-Shield areas of the Tay, downstream of Christie Lake. While reducing biological diversity and water retention/storage, the loss has provided areas of settlement and gains in agricultural productivity.

However, with a changing climate affecting water levels in the Tay, efforts should be made to protect remaining wetlands (and woodlands) to ensure that they can continue to provide critical hydrological functions, including flood attenuation, along with the many biological and ecological functions and numerous economic and recreational benefits they provide to residents of the subwatershed.

Shorelines

The Benefits of Well-Vegetated Shorelines

The shoreline (or riparian) zone is that special and vulnerable area where the land meets the water. Keeping shorelines well vegetated with native trees and shrubs is a major goal because of their importance in preserving water quality and supporting healthy aquatic habitats. Natural shorelines intercept runoff that carries sediment, pesticides and fertilizers that can reduce water quality and harm aquatic habitat in lakes, rivers and streams. Well established vegetative buffers also protect streambanks from erosion, improve habitat for aquatic organisms by shading and cooling the water and provide protective cover for birds and other wildlife that feed and rear their young near water.

Experts believe that a naturally-vegetated buffer of at least 30 metres around a lake or on either side of a watercourse should be maintained for the protection of water quality and instream and shoreline habitat. A recommended target in the Great Lakes region is to have a minimum of 30 metres of natural vegetation adjacent to a stream or around a lake for at least 75 percent of its length.[2]

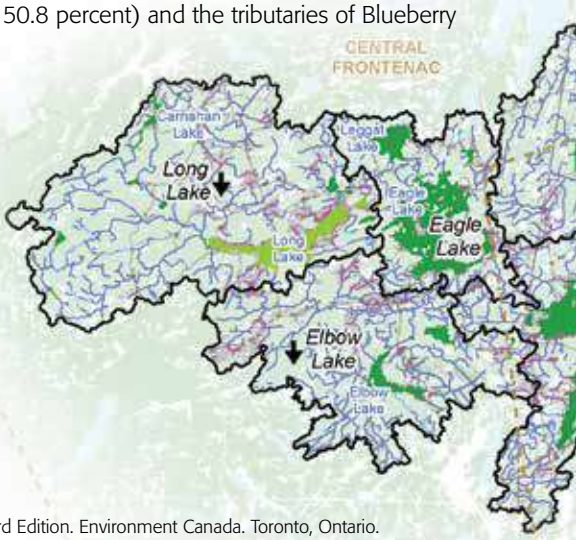
Shoreline Cover in the Tay River Subwatershed

Shoreline cover percentages by catchment are given for each of the 14 catchments of the Tay River Subwatershed. The Shoreline Cover by Catchment table shows that 11 catchments meet or exceed the 75 percent target figure with the exception of the Grants Creek, Perth and Port Elmsley Catchments. The map highlights (in fuchsia) the lakes and watercourses with natural shoreline cover falling below that figure along with any changes in catchment shoreline cover that have occurred since 2008.

A different story unfolds when looking at shoreline cover lake by lake and along tributaries. Seven of the lakes monitored through the Watershed Watch Program have shoreline cover below the 75 percent guideline target (Christie at 68.4, Crosby at 57.8, Crow at 68.6, Farren at 67.4, Long at 67.9, Otty at 61.4 and Pike at 69.6 percent) along with the Tay River flowing through the Town of Perth (at 50.8 percent) and the tributaries of Blueberry

Shoreline Cover by Catchment

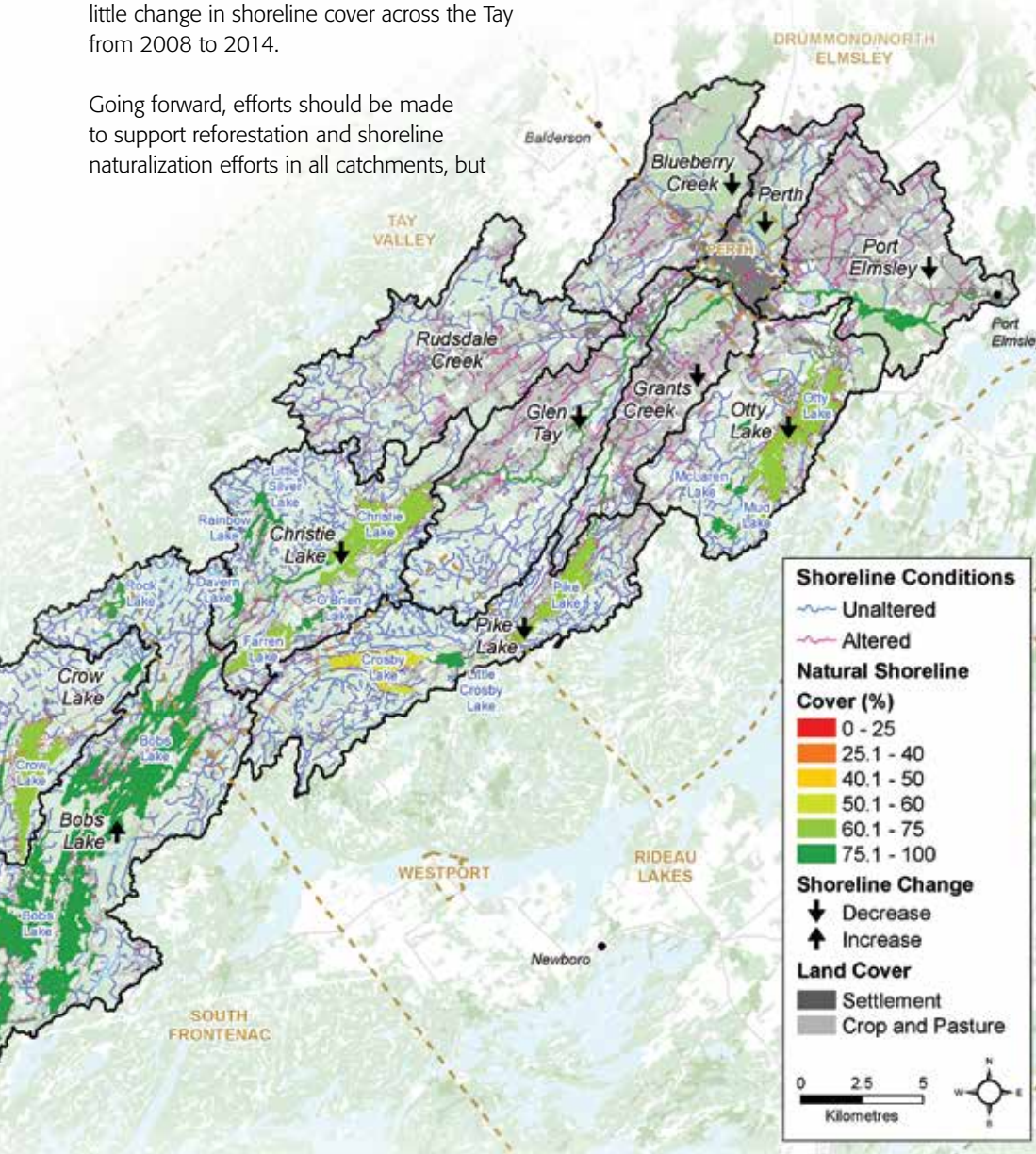
Catchment	Natural Shoreline in 2014	Natural Shoreline Change Since 2008	
Blueberry Creek	75.1%	-0.06%	-0.17 ha
Bobs Lake	90.0%	0.05%	1.05 ha
Christie Lake	91.6%	-0.01%	-0.18 ha
Crow Lake	94.2%	0.00%	0.00 ha
Eagle Lake	92.5%	0.00%	0.00 ha
Elbow Lake	90.6%	-0.03%	-0.28 ha
Glen Tay	79.8%	-0.08%	-0.67 ha
Grants Creek	60.6%	-0.09%	-0.33 ha
Long Lake	89.7%	-0.02%	-0.22 ha
Otty Lake	81.4%	-0.05%	-0.32 ha
Perth	68.7%	-0.60%	-1.26 ha
Pike Lake	91.5%	-0.03%	-0.31 ha
Port Elmsley	52.0%	-0.09%	-0.38 ha
Rudsdale Creek	78.1%	0.00%	0.01 ha
Subwatershed Average	**85.6%**	**-0.03%**	**-3.05 ha**



[2] Environment Canada. 2013. *How Much Habitat is Enough?* Third Edition. Environment Canada. Toronto, Ontario.

and Grants Creeks (at 70.6 and 53.5 percent). Similarly, the headwater supporting tributaries in the Perth and Port Elmsley Catchments have natural shoreline cover below the guideline (at 72.7 and 39.9 percent). Much of the altered shoreline — aside from the lakes — in the Tay is indicative of historical watercourse straightening and wetland drainage efforts to improve surrounding lands for agricultural purposes. The good news is that there has generally been very little change in shoreline cover across the Tay from 2008 to 2014.

Going forward, efforts should be made to support reforestation and shoreline naturalization efforts in all catchments, but with a focus on those catchments — Blueberry, Grants, Perth and Port Elmsley — and those lakes — Christie, Crosby, Crow, Farren, Long, Otty and Pike — which have shoreline cover at or below the 75 percent guideline figure. Attention should also be focused on maintaining natural shorelines, riparian buffer areas and naturalize hardened, degraded or ornamental shorelines, where feasible, to maintain the health of the Tay.



Water Quality

The Benefits of Good Water Quality

Clean water is essential for healthy families and communities. We rely on clean water for farming, fishing, water sports and other recreational activities. Good water quality promotes a diverse and healthy aquatics ecosystem. Healthy waterbodies support local tourism, business activities and municipal economies.

How is Water Quality Measured

Water quality ratings for Tay River Subwatershed lakes, the Tay River and streams are made up of many water quality parameters blended together to allow water quality to be represented across a range of categories from Very Poor, to Poor, Fair, Good and Very Good. This is based on the Canadian Council of Ministers of the Environment Water Quality Index (CCME WQI) and guidelines for the protection of aquatic life; it does not reflect the suitability of water quality conditions for recreational uses such as swimming or other water sports.

The ratings are calculated at three-year intervals to portray the range of water quality conditions at a site and how they may (or may not) have changed over a 12 year period. The coloured circles on the map show this range of water quality conditions at each site by indicating the lowest and highest rating (left and right side of circle respectively) achieved at a site from 2006 to 2017 (i.e., not a trend in water quality).

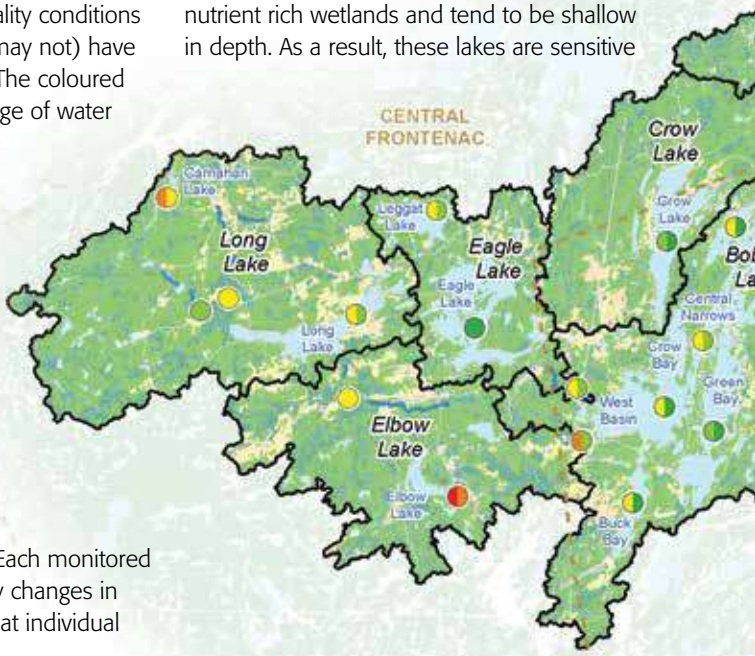
Across the Tay River Subwatershed, surface water quality ranges from Very Poor to Very Good. These results have been compiled for a monitoring network of 50 sites. Each monitored site is unique. To understand any changes in water quality, one needs to look at individual sampling results over time, the specific location of the sampling site and adjacent land uses.

Lake Water Quality in the Tay River Subwatershed

The final water quality rating for lakes is based on an analysis of five parameters from water samples collected four times a year from 26 sites extending over a 12 year period. The parameters are phosphorus, Kjeldahl nitrogen, dissolved oxygen/temperature conditions, pH and Secchi depth.

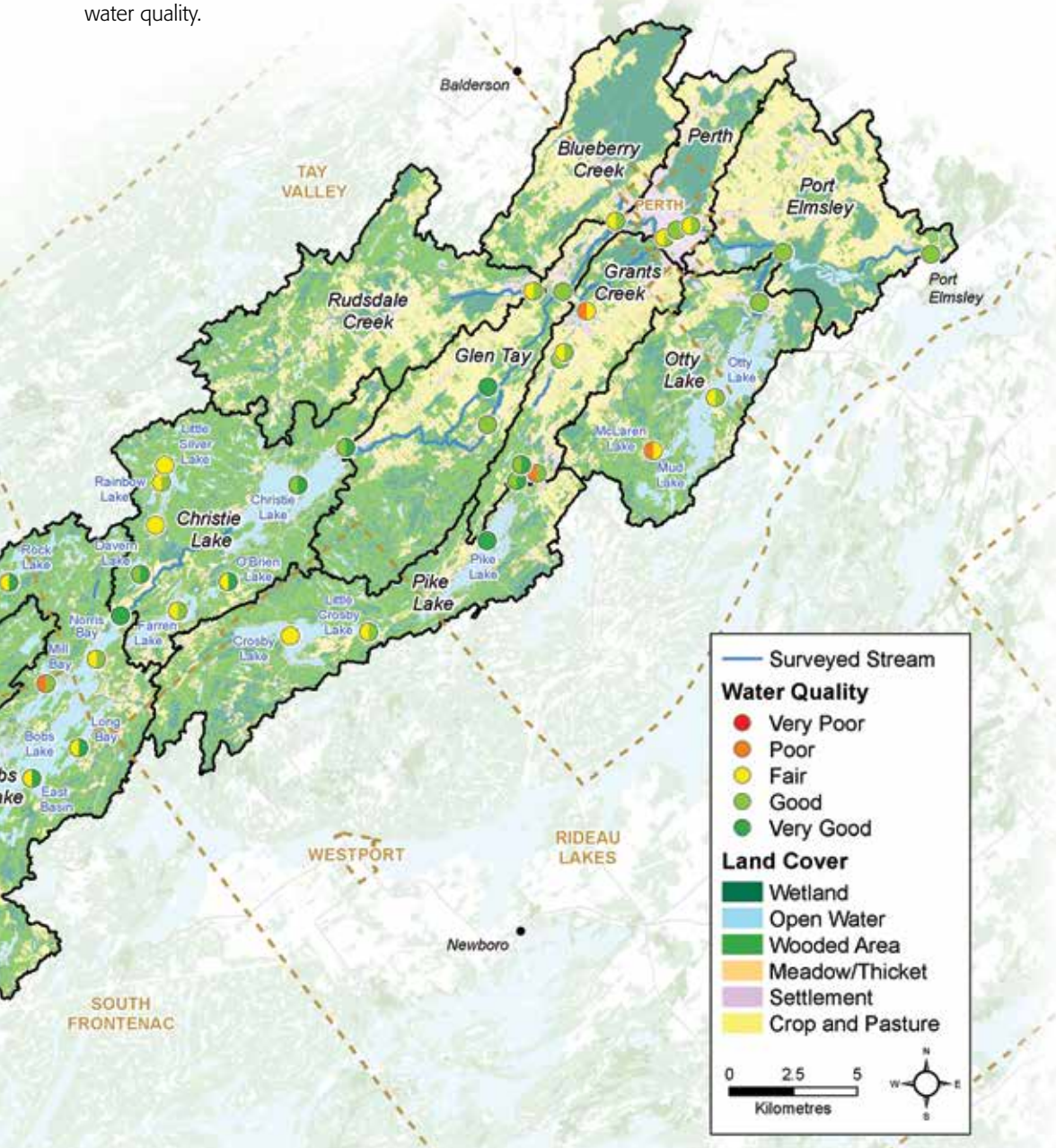
Most of the water quality ratings for the Tay River Subwatershed lakes range between Fair and Good. These ratings are largely influenced by the surrounding land cover, which is dominated by woodland and wetland in the mid to upper watershed and more extensive areas of crop and pasture land in the lower watershed. Many of the Tay lakes have developed shorelines with permanent and seasonal residences.

A few of the smaller lakes in the upper watershed had some Poor ratings in the 12 year time frame. These lakes are fed by nutrient rich wetlands and tend to be shallow in depth. As a result, these lakes are sensitive



to nutrient inputs, warming of the water column, limited dissolved oxygen availability and re-suspension of nutrients from wind and mixing events. Some of these smaller lakes received a lower water quality rating due to naturally occurring elevated nutrient levels. Protection of the surrounding natural habitat should be a priority to safeguard their water quality.

Regarding conditions for recreational use of the Tay lakes, it is important to note that *E. coli* counts are regularly monitored around those lakes with extensive development and that bacterial counts are very low at most sampling locations and do not provide any indication of impairment for recreational use.



Water Quality

Overall, there has been little change in the water quality rating(s) for each lake, indicating that conditions have remained consistent. Having said this, it is important to note that an improvement in the water quality rating has been observed in Rainbow Lake and Mill Bay (Bobs Lake); this can be attributed to less frequent exceedances in nutrient parameters.

Stream Water Quality in the Tay River Subwatershed

The final water quality rating for streams is based on an analysis of 22 parameters taken at 24 sampling sites, six times a year, over a 12 year period. These parameters include phosphorus, Kjeldahl nitrogen, *E. coli*, iron, copper, alkalinity and total suspended solids.

Water quality ranges from Poor to Very Good across the Tay, depending on the specific location and the influence of adjacent land uses such as agriculture, commercial, industrial, residential and waste disposal areas. All sites on the Tay River range from Good to Very Good with those sites in the Good category generally showing occasionally elevated nutrient and *E. coli* results. Tributary creeks such as Eagle, Fish, Grants, Jebbs, Rudsdale, Stubbs and Uens

generally fall within the Fair to Good range. In most cases this is due to elevated nutrients and *E. coli* and, at some sites, exceedances of metals such as aluminum and iron.

Overall, there was little change in the water quality rating at stream monitoring sites, indicating consistent water quality conditions. Improvements were noted at two sites: Grants Creek (downstream of Pike Lake at Scotch Line Road) due to fewer exceedances of copper above the guideline and Rudsdale Creek (at Christie Lake Road) where a reduction of *E. coli* exceedances was observed.

Any variability in lake and stream water quality conditions reflects the impact of many factors such as land use, natural variability in the aquatic ecosystem and weather. In the majority of cases, water quality can only be improved by reducing the source of nutrient inputs, protecting natural shorelines, minimizing overland runoff of water and reducing known point and non-point sources of pollution through good land stewardship and the use of shoreline best management practices.

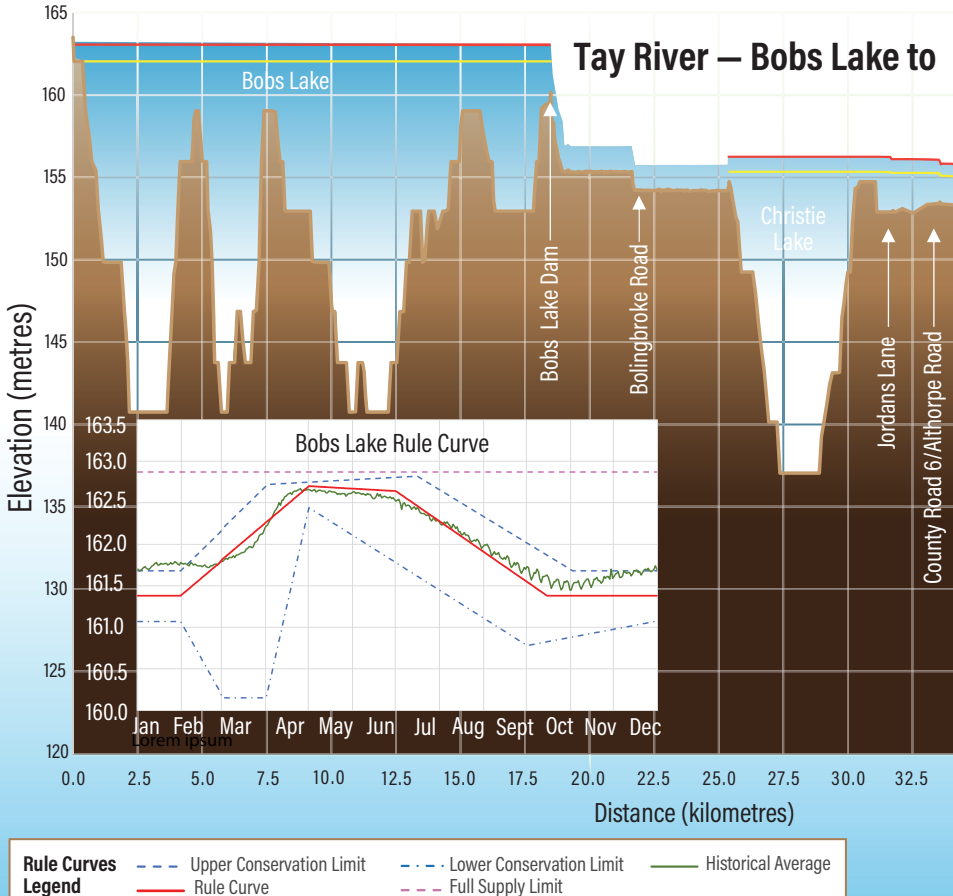
Water Levels

There are forty-three named lakes in the Tay, a major subwatershed of the Rideau Valley Watershed, and numerous, smaller waterbodies, wetlands and even a snye (a side channel of the Tay River). The largest lake, Bobs, serves as a reservoir for the Tay and Rideau Canals.

Bobs Lake is controlled by a dam that is operated by Parks Canada. The Ontario Ministry of Natural Resources and Forestry operates the dam at the outlet of Farren Lake and the Pike Lake Dam on the Tay tributary, Grants Creek. All of the dams are operated according to what are called rule curves. The rule curves consist of specific targets for each day of the year to provide water levels that have a minimum of 1.5 metres of draft during the navigation season throughout the Canal system.

The small graph on the profile of the Tay River shows the rule curve (solid red line) within the operating range (between the Upper and Lower Conservation levels — dashed blue lines). This depicts the lowered water level through the winter, the increased level into the spring, the spring thaw maxima and the gradual decline through the summer to the winter level in October. The entire range is about 2.5 metres. Typically, however, as shown by the solid green line which is the Historical Average (1984–2013), the annual fluctuation is closer to 1.3 metres.

The fluctuation of the green line demonstrates how difficult it is to keep to established operational policies when dealing with natural processes. Case in point is the impact of management decisions made for Bobs Lake that affect not only Crow Lake, but also

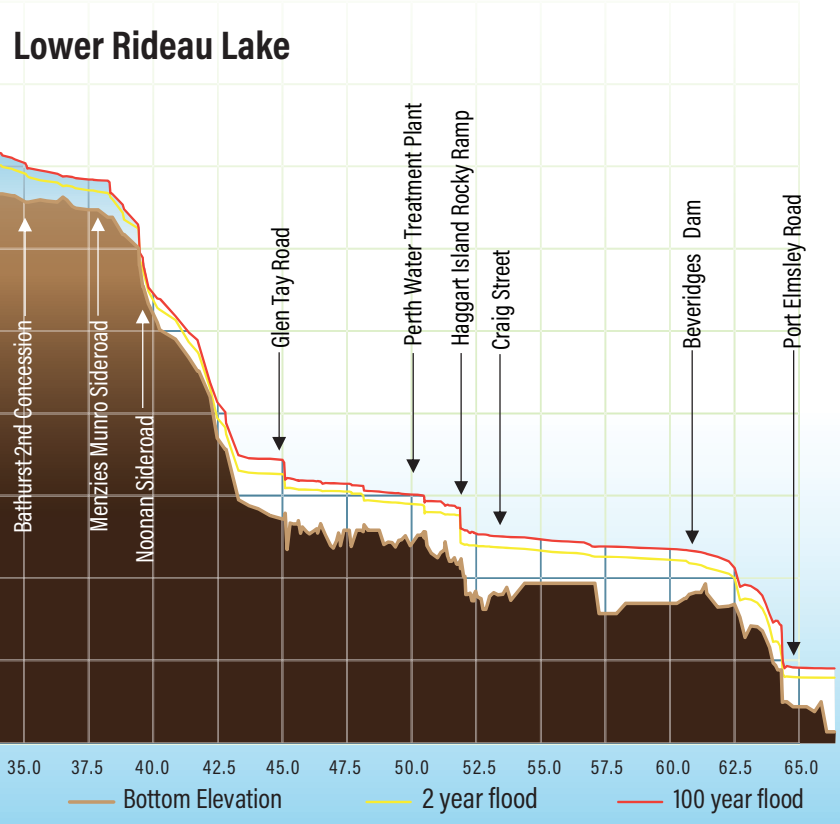


Christie Lake. Bobs Lake is five times the size of Christie Lake, so that a dam operation to lower Bobs Lake by one centimetre can raise Christie by five centimetres. This operational challenge became evident in 2017, when Christie Lake experienced significant flooding.

While navigation is the primary purpose of the control of levels on the lakes, Parks Canada staff recognize that there are seasonal and permanent residents on the lakes who have interests in water levels beyond boating. They wish to have water levels that fluctuate as routinely as possible to avoid shoreline erosion and damage to structures such as docks and boathouses while retaining their functionality along with access that allows for water recreational activities like swimming and fishing. The system is also operated with consideration for fish and wildlife habitat and their reproduction requirements.

All of the lakes in the Tay Watershed are subject to changing environmental conditions. Hot, dry summers cause a lot of evaporation from waterbodies (as much as two centimetres per day) leading to lower water levels, as experienced in 2016. Wet summers bring the possibility of minor flooding. With more people taking up permanent residency around lakes, there are now year-round water level issues associated with a little or a lot of precipitation along with colder or warmer temperatures. For lakes that do not have dams controlling water levels, there is a general predictability in the annual fluctuation but also an unpredictability that requires careful planning when considering the construction of a dwelling on a shoreline property.

For further information about Rideau and Tay Canal operations, contact the Parks Canada Agency at https://www.pc.gc.ca/en/lhn-nhs/on/rideau/info/infonet



Accomplishments

Since RVCA's last *Tay River Subwatershed Report* in 2011, a lot of good people have done a lot of good work. In fact, a great deal of activity is a result of recommendations from our 2002 *Tay Watershed Management Plan.* The enthusiasm and interactions across the watershed have remained strong, and by working together, many significant achievements have been made towards maintaining and improving environmental conditions in the Tay Subwatershed.

Tay Watershed Management Plan

- Brought together a diverse group of watershed stakeholders to exchange information and opinions on the challenges facing the watershed. This forum focused the community on the need for managing the Tay Watershed, requiring positive cooperation amongst a range of stakeholders
- Developed a foundation of data and information on the watershed and resources against which later developments and trends are being measured and decisions are being made
- Led to the formation of the Friends of the Tay Watershed Association, who have been instrumental in helping to implement 20 of the 24 recommendations in the Management Plan
- Prompted the expansion of other watershed organisations and activities involved in the protection of the watershed, including the Lake Networking Group, Lake Links and Watersheds Canada
- Led to the development of nine Lake Management Plans and State of the Lake Reports on Christie (2009), Eagle (2011/2015 Update), Farren (2009), Long (2009), Otty (2007/2008/2014 Review) and Pike (2010) lake, as well as six Lake Stewardship Guidelines and Plans on Bobs and Crow (2007), Christie (2011/2015 Update), Elbow (2012), Little Silver and Rainbow (2018) and Pike (2011) Lake
- Helped to focus agency and community efforts on the Tay River fishery resulting in the report titled Fish Habitat of the Tay River Watershed: Existing Conditions and Opportunities for Enhancement (2002)

Environmental Monitoring

- 96 lake sites monitored along with 24 stream sampling sites to assess surface water conditions in the Tay for a total of 392 sampling visits every year
- 10 sites on the Tay River and tributary streams to monitor benthic invertebrates
- 71.4 km of streams surveyed and 313 headwaters sites sampled
- 800 km^2 of land cover classified into eight classes, including forest and wetland cover, using 2008 and 2014 colour aerial photography

Stewardship and Protection

- 250,810 trees planted at 42 sites creating 128 hectares of new forest cover
- 10,563 trees and shrubs planted along shorelines at 96 sites
- 83 rural clean water projects controlling 248 kg of phosphorous/year
- 418 *Planning Act* applications commented on and 125 permit applications reviewed regarding development on hazard lands (flood prone areas, steep slopes, unstable soils) and in environmentally and hydrologically sensitive areas (wetlands, shorelines, valleylands) from 2012 to 2017
- 553 septic system approvals issued in Tay Valley Township
- 496 septic system re-inspections completed (Central Frontenac: 51 voluntary inspections, Drummond/North Elmsley: 25 mandatory inspections, Rideau Lakes: 57 voluntary inspections, Tay Valley: 60 voluntary and 303 mandatory inspections). These septic system re-inspections take place on lakes: Drummond-North Elmsley (Otty), Central Frontenac (Eagle), Rideau Lakes (Crosby, Little Crosby, Pike) and Tay Valley (Bobs, Christie, Davern, Farren, Little Silver,

McLaren, O'Brien, Otty, Pike, Rainbow) and along the Tay River (West of Perth) and Grants Creek in Tay Valley Township
- Invading Species Awareness Program addressing threats posed by aquatic and terrestrial invading species
- Aquatic Plants Program addressing water quality impacts
- Use of innovative technologies to address water-related challenges, including the Town of Perth's installation of the water and wastewater lagoon treatment systems, and the replacement of the Haggart Island Dams with rocky ramps
- Establishment of the Mayor's Task Force on Climate Change in the Town of Perth and Tay Valley Township's Green Energy and Climate Change Working Group

Actions

A healthy watershed supports our local economies and communities. Now is the time for all of us to take additional steps — big and small — to help maintain and improve the health of the Tay River Subwatershed. We know that water quality and quantity is influenced by our use of land, so we need to understand how our actions affect lakes, streams and wetlands and then take steps to improve conditions. Only by working together will we make gains. Here is what we can do …

RVCA

- Continue to monitor stream characteristics, classify land cover and analyze water quality to identify trends for use in watershed reporting, land-use planning, development approvals and stewardship targeting
- Review existing aquatic and surface water quality monitoring network to improve watershed conditions reporting
- Initiate actions in key program areas to adapt to the effects of climate change and mitigate its effect on the watershed
- Enhance flood forecasting and warning capabilities in the Tay Subwatershed
- Continue to provide technical and financial support to landowners to plant trees, naturalize shorelines, adopt agricultural best management practices and undertake projects that improve water quality and target these activities where they are needed most (as identified in this report and accompanying catchment reports)
- Promote natural channel design and low impact development practices (bio-swales, pervious pavers, infiltration trenches, stormwater management retrofits, combined sanitary and storm sewer separation) in Perth and other settlement areas to improve local conditions and build watershed resiliency
- Continue providing planning advice to municipalities and regulating development on hazard lands (flood prone areas, steep slopes, unstable soils) and in environmentally and hydrologically sensitive areas (wetlands, shorelines, valleylands)
- Work with municipalities and agencies to implement land use planning and development policies in a more consistent manner across the watershed to protect watercourses, headwater drainage features, wetlands and naturally vegetated shorelines and achieve net environmental gains (particularly development setbacks and vegetated shorelines)
- Monitor that conditions of regulatory approvals are implemented
- Identify flood hazard levels and produce regulation limit mapping around lakes
- Continue to provide septic system review and approval services in Tay Valley Township and expand this service to other municipalities
- Continue to provide septic system re-inspection services to municipalities
- Acquire and protect additional lands that are ecologically and hydrologically important such as shorelines, wetlands, floodplains and significant wildlife/woodland habitats through land donations or other land acquisitions
- Provide passive recreational and interpretive opportunities at our Conservation Areas which are managed using wise resource management principles
- Help municipalities implement environmental strategies and initiatives

Municipalities

- Develop and implement environmental strategies and initiatives such as those described in the Town of Perth's Strategic Plan
- Ensure new development, re-development and site alterations adhere to current development standards (as described in Official Plans, Zoning By-laws and the *Ontario Building Code*)
- Monitor that conditions of planning and development approvals are implemented

- Ensure Committees of Adjustment fully consider technical and environmental recommendations coming from planning and environmental professionals
- Use RVCA's subwatershed and catchment reports (including 2014 land cover) when updating Official Plan policies and schedules to protect water resources and natural features (including rivers, lakes, woodlands, wetlands, and shorelines)
- Implement stormwater management best practices including low impact development measures and stormwater retrofits in Perth and other settlement areas
- Continue mandatory and voluntary septic system re-inspection programs and consider expanding them to other lakes and watercourses

Residents, Businesses, Community Groups and Lake Associations

- Ensure new development and re-development on waterfront lots (including houses, septic systems, auxiliary buildings, decks and swimming pools) meets appropriate development setbacks from creeks, streams, lakes and rivers (30 metre minimum)
- Use advanced septic treatment systems where shoreline development setbacks cannot be met
- Ensure septic systems and wells are properly constructed and maintained
- Participate in voluntary septic system re-inspection programs and advocate for municipalities to adopt mandatory programs on lakes and rivers
- Maintain a healthy, vegetated shoreline buffer or naturalize degraded or ornamental shorelines
- Protect important natural features on properties like wetlands, woodlots and windbreaks
- Donate environmentally sensitive lands to a public land trust or other such organizations
- Plant trees on idle or retired land
- Take measures to help control and prevent the spread of invasive species
- Continue to undertake habitat restoration and enhancement projects to improve aquatic/terrestrial conditions
- Implement agricultural best management practices (retire sensitive lands, control soil erosion and nutrient loss, restrict livestock streamside grazing, maintain soil moisture through tile drainage best practices and year-round cover crop management)
- Reduce surface water runoff (and erosion) to lakes and watercourses by applying various infiltration methods (minimizing hardened surfaces, using permeable materials, directing runoff to vegetated areas and installing rain barrels)
- Act on actions and recommendations listed in the 15 Tay Lake Management and Stewardship Plans
- Raise public awareness about the Tay Watershed, its issues and needs through groups like Friends of the Tay Watershed Association and lake associations

Help is Out There

Working together we can make the Tay River Subwatershed even better!

Interested in doing something? There are a number of programs and organizations that provide technical support and grant dollars. The best way to learn about these programs is to contact the RVCA. Staff will connect you to the best program within the RVCA or through partner organizations such as Ducks Unlimited Canada, Friends of the Tay Watershed, Lanark Stewardship Council, Lake Associations, the Ontario Soil & Crop Improvement Association and Watersheds Canada.

Planning a project on your property? Be sure to check with your municipality and the RVCA to see if permits are required. Checking first could save you time and money. Thinking of buying a property? We can let you know if and how the property might be affected by RVCA policies and regulations.

RIDEAU VALLEY
CONSERVATION AUTHORITY

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