# Mississippi River
# **Watershed Plan**
# July 2021

Mississippi Valley
Conservation Authority

# Indigenous Engagement

At the outset of this project, MVCA made a firm commitment to undertake meaningful engagement with Indigenous communities. We recognize the interconnectedness and rich knowledge the Indigenous Peoples of this place possess. This project has presented a welcome opportunity for the MVCA to work with the Indigenous communities to develop and build a solid and mutually respectful relationship. MVCA also recognises the opportunity this presents to learn from the indigenous communities and to strengthen its own connection to the land.

Although not mandated, early in the planning process MVCA undertook to have an Indigenous Engagement Plan (IEP) prepared under the guidance of Cambium Indigenous Professional Services (CIPS). The IEP sets an implementation strategy to ensure that all First Nation leaders and Indigenous Peoples/groups, with an interest in the watershed, are given full opportunity to provide input and have their knowledge and ideas included in this Plan. It is recognized that early interaction through information sessions, written correspondence, and/or meetings with the First Nation leaders and Indigenous Peoples/groups sets the stage for developing relationships that are hoped to extend well beyond the planning phases of this project. Although the original intent of this initiative was to actively engage at the early stages, and information packages were sent out, circumstances surrounding the global pandemic prohibited engagement opportunities.

MVCA is committed to undertake meaningful engagement with the Indigenous Communities and have their input included in this plan. As a living document, we will continue to implement the IEP and the plan will be adjusted as needed to reflect those outcomes.

## Acknowledgments

Mississippi Valley Conservation Authority (MVCA) acknowledges that the watershed is situated on the Traditional Territories of the Mississauga and Chippewas of the Williams Treaties First Nations as well as the Omàmìwininì Algonquins of Ontario. This acknowledgement comes from a place of respect for the land, people and the unique history of the territory, and for the rights of the Indigenous Peoples who have cared for this land since time immemorial. We acknowledge the injustices of the past and those that continue today and we are dedicated to honoring Indigenous history and culture as well as committed to moving forward in the spirit of reconciliation and respect with all First Nation, Métis and Inuit Peoples.

## Thanks

We would like to acknowledge the contributions of all those who participated in the development of the Mississippi River Watershed Plan.

## Accessibility

Mississippi Valley Conservation Authority is committed to excellence in serving everyone including people with disabilities. We have made every reasonable effort to ensure that this document adheres with the specific standards of accessibility as required by *The Accessibility for Ontarians with Disabilities Act*.

# Contents



**Note about the map images:** Unless otherwise referenced, the maps in this document were produced in part with data provided by the Ontario Geographic Data Exchange under License with the Ontario Ministry of Natural Resources and Forestry and the Queen's Printer for Ontario, 2021.

# List of Acronyms

ANSI - Area of Natural and Scientific Interest
CA - Conservation Authority
DFO - Department of Fisheries and Oceans Canada
EC - Environment Canada
IEP - Indigenous Engagement Plan
IPCC - Intergovernmental Panel on Climate Change
LID - Low Impact Development
MECP - Ministry of Environment, Conservation and Parks
MNRF - Ministry of Natural Resources and Forestry
MNDMF - Ministry of Northern Development, Mines and Forestry
MRSPP - Mississippi-Rideau Source Protection Plan
MRSSO - Mississippi-Rideau Septic System Office
MRWMP - Mississippi River Water Management Plan
MTO - Ministry of Transportation of Ontario
MVCA - Mississippi Valley Conservation Authority
OMAFRA - Ministry of Agriculture, Food and Rural Affairs
PPS - Provincial Policy Statement
PSW - Provincially Significant Wetland
SPA - Source Protection Authority
WSC - Water Survey of Canada

# 1 Introduction

## Mississippi Valley Conservation Authority

Conservation authorities are mandated to "study and investigate the watershed and to determine programs and services whereby the natural resources of the watershed may be conserved, restored, developed and managed".[1] The development of a watershed plan is a key step to fulfilling this responsibility.

MVCA's full area of jurisdiction covers the watersheds of the Mississippi River in Eastern Ontario, the adjacent Carp River, and several smaller watercourses, all of which flow directly into the Ottawa River. This Watershed Plan is specific to the watershed area of the Mississippi River, as described on Page 10.

Established under the *Conservation Authorities Act*, the Mississippi Valley Conservation Authority (MVCA) is a watershed-based organization responsible for flood and erosion control, flood forecasting and warning, and providing expertise on and regulating land use planning matters related to flood and other hazards. Under the *Clean Water Act*, MVCA is also responsible for supporting municipalities in the protection of drinking water through Source Protection. MVCA monitors and reports on water quality and delivers various programs aimed at protecting the health of the watershed. As such, it is well positioned to help coordinate actions amongst the many bodies involved in water management and protection.

[1] Section 21(a) *Conservation Authorities Act*, RSO 1990


*Figure 1: Diagram of Watershed Interactions*

# Integrated Watershed Planning

> Human activities can place direct and indirect impacts and stressors on water resources and ecosystem functions. **Integrated Watershed Management** is the process of managing human activities and natural resources on a watershed basis, considering social, economic and environmental issues, as well as community interests, in order to manage water resources sustainably.
>
> (Conservation Ontario, 2021)

A watershed describes an area of land that contains a network of creeks, streams and other waterways, that all drain into a single larger body of water, such as a large river. Within a watershed, surface and groundwater are generally connected, as water flows across the landscape through waterways, or vertically through the various layers of soil, and through cracks and fissures in the bedrock. As depicted in Figure 1, watersheds are complex natural systems where activities and conditions that affect water quality, quantity or flows in one part of the watershed may affect locations downstream.

The Mississippi River watershed covers 3,765 $km^2$ of land, spans 11 municipalities, and supports over 42,000 year-round residents and many seasonal residents. The natural features of the watershed offer numerous ecosystem services to those who live, work and play within its landscapes. They provide drinking water; replenish wetlands and groundwater; and support agriculture, forestry, hydroelectric power, recreation and tourism. The watershed also supports vast interconnected communities of plants, animals, birds, fish and other organisms.

MVCA completed its first Watershed Plan in 1983 and has since implemented many of its recommendations. A new Integrated Watershed Plan is needed to provide long-term guidance for MVCA's activities within the Mississippi River watershed. This new plan reflects current watershed conditions and anticipated changes related to climate, land

use, and the environment. It identifies key issues and challenges, and presents strategic actions aimed at maintaining a healthy river and watershed while balancing the needs of its many users.

## The Watershed Planning Process

The Integrated Watershed Plan process is one of understanding, collaboration, implementation and continued improvement (see Figure 2). This Plan is intended to provide long-term (about 20 year) direction with regular reviews and updates every 5 years.

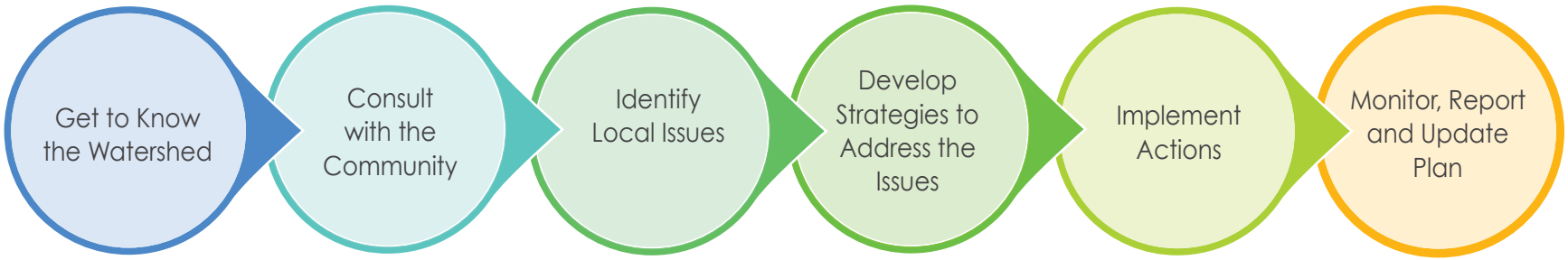



***Figure 2: Watershed Planning Process***

The foundation of this Plan is through understanding of, and appreciation for, the Mississippi River watershed from each of the environmental, social, cultural and economic perspectives. A number of community interests had a voice in identifying the key issues impacting the watershed's resources, and in recommending strategies to address the most significant issues and watershed stressors.

### Understand the Watershed and Identify Issues

Commencing in 2019, a detailed review of background information and data was completed to document and characterize the current state of the watershed. Wherever possible, information was also analyzed to assess relevant changes over time. This work was enhanced by local insight and knowledge provided by watershed stakeholders

and local technical experts, and is summarized in a series of four "Backgrounders" released in 2020.

- Backgrounder One: **PHYSICAL ENVIRONMENT**
- Backgrounder Two: **PEOPLE AND PROPERTY**
- Backgrounder Three: **NATURAL SYSTEMS**
- Backgrounder Four: **ASSET MANAGEMENT**

The Backgrounders provided the basis for initial consultation and discussion with key stakeholders, and the broader watershed community, who partnered in developing this Watershed Plan.

## Public Advisory Committee (PAC)

In Fall 2019, a Watershed Plan Public Advisory Committee (PAC) was formed by the MVCA Board of Directors. The PAC is comprised of 10 representatives from a number of sectors including agriculture, environment, forestry, hydro power, lake associations, land development, tourism as well as the general public. The Committee met numerous times throughout the development of the Plan. It's members have played a critical role in helping MVCA to identify and explore issues and to assess possible actions. The Discussion Papers and this Plan reflect the significant time and investment of the Public Advisory Committee members.

## Indigenous Engagement

The engagement of Indigenous Communities is ongoing. This plan presents a welcome opportunity for MVCA to work on building respectful, reciprocal relationships with the Indigenous Peoples and Communities who have been the caretakers of this land since time immemorial. This will involve including Indigenous knowledge and insight about the watershed and working together to determine collaborative actions to further good stewardship of the land, water and ecosystems that they support. An Indigenous Engagement Plan (IEP) is directing the path that engagement is taking, respecting the customs and needs of the Indigenous Peoples. This Plan will be updated to reflect the outcomes of this engagement.

## Engage Stakeholders and the Public

The Watershed Plan was developed through engagement with a range of stakeholders including federal, provincial and municipal government, environmental organizations, the sectors and communities represented by the PAC and the general public. Engagement took place through in-person meetings, webinars, advertisements and promotions through print and social media, and on-line surveys. The input received through these engagement activities assisted in identifying watershed issues and the related actions that are recommended in this Plan.

**Appendix A** provides a record of the consultation and engagement undertakings and a listing of the groups that were included in the process.

## Partner Agency and Stakeholder Involvement

The steps and the stakeholders involved in various stages of the engagement process are shown in Figure 3.

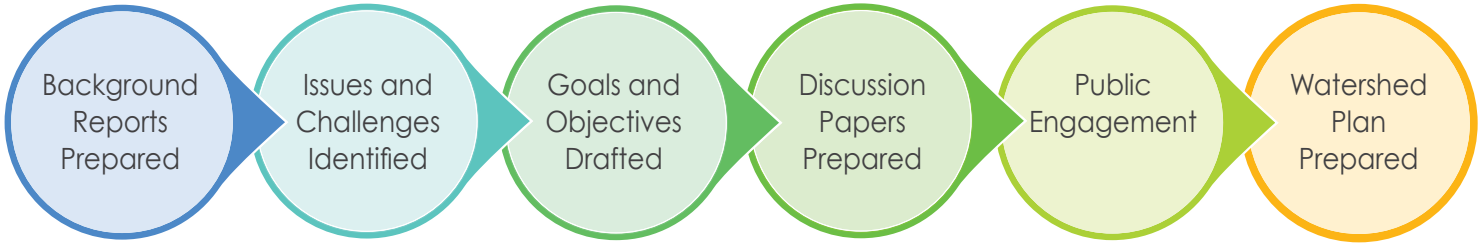



***Figure 3: Engagement Process – Steps and Stakeholder Involvement***

* Technical Review included circulation of MVCA staff, Federal and Provincial agencies, Health Units, Municipal Staff

## Key Watershed Stressors

- Climate Change Impacts
- High Growth and Development Impacts
- Water Quantity Challenges and Storage Limitations
- Water Quality and Source Water Protection Concerns
- Aging and Inadequate Infrastructure
- Stresses on Natural Features and Systems

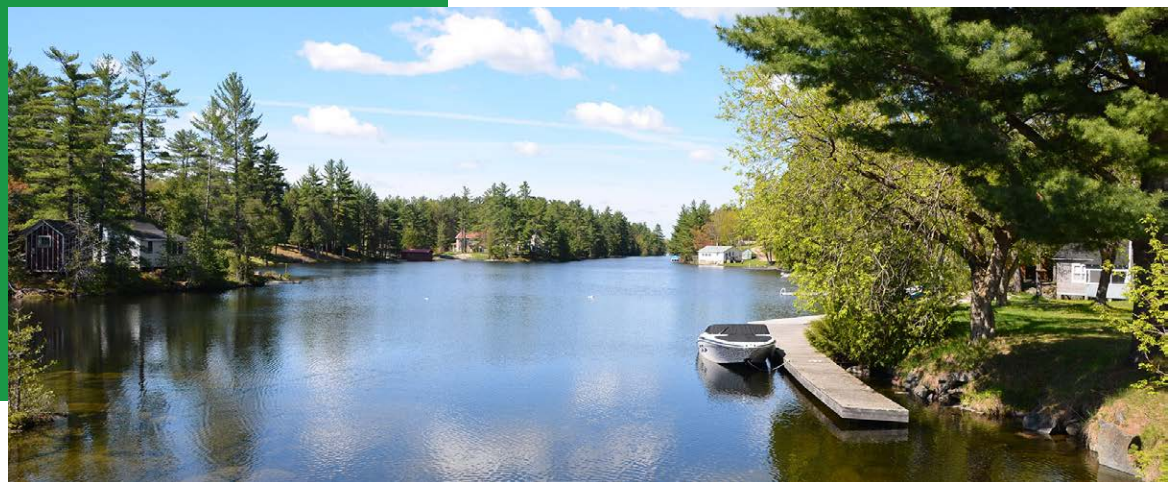
## Watershed Stressors

In each of the Background Reports, key issues and stressors within the watershed were identified. After completing the background phase, MVCA worked closely with PAC members and MVCA's Policy and Priorities Committee (a sub-committee of the MVCA Board of Directors) to identify priority areas for action to address the issues and challenges that were identified. The stressors listed to the left are reflected in the listings of challenges presented in Section 3 of this document.

## Discussion Papers

Building upon the Background Reports, a series of Discussion Papers were developed to help stimulate public engagement discussions. The papers focused on eight themes: Agriculture, Growth and Development, Forestry, Municipal Infrastructure, Natural Systems, Tourism, Water Management, and Waterfront Properties. They presented general information about each topic and listed associated challenges and opportunities along with some draft actions to address the identified challenges. A total of 34 strategic actions were identified and are presented under Section 3 of this Plan.

Big Gull Lake



# Watershed Plan Goals

These Watershed Plan goals adopted by the MVCA Board of Directors, were developed based upon the issues raised in the background reports, through input received from the PAC, and through a technical review by a number of partners including municipal staff, provincial and federal agencies.

1. To collaborate with watershed partners in promoting an integrated and consistent approach to the health and management of the watershed and water resources.

2. To increase our resiliency and adaptive response to climate change.

3. To support environmentally sustainable growth and economic development.

4. To use and manage both surface water and groundwater wisely to meet current and future needs under normal and extreme conditions.

5. To minimize risks to human life and property due to flooding, erosion, and unstable slopes and soils.

6. To sustain or improve current water quality for all users.

7. To maintain, enhance, or restore natural features and systems for all users.

8. To support learning and environmental stewardship.

# 2 Overview of the Watershed

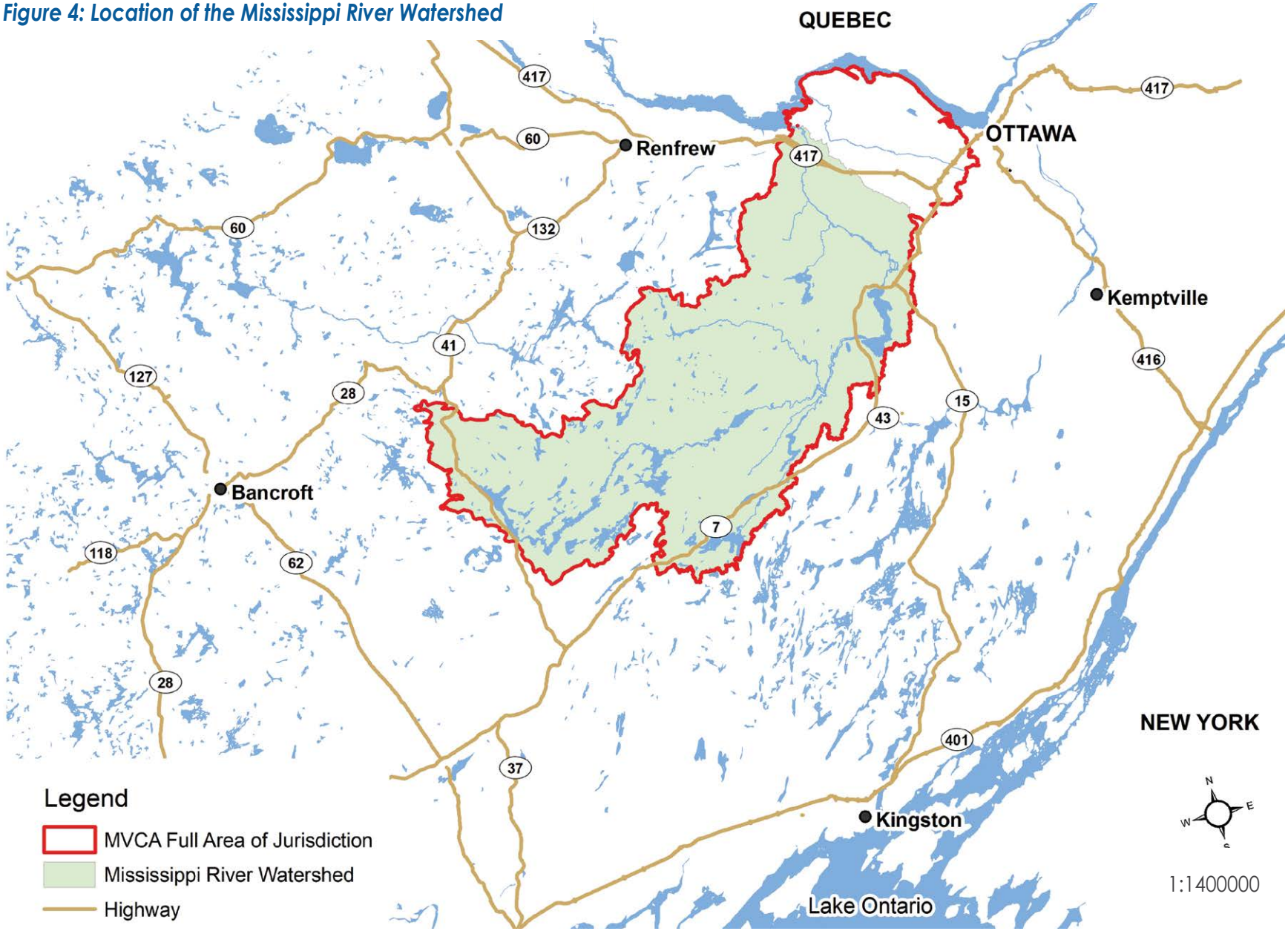
## The Watershed

Located in Eastern Ontario, west of the City of Ottawa (Figure 4), the Mississippi River watershed is 3,765 km2 in size and encompasses eleven municipalities serving the needs of its year-round and seasonal residents, and various economic communities.

The watershed has two distinct physiographic regions: the Canadian Shield in the west; and the Ottawa-St. Lawrence Lowland basin in the east. The divide between these "Shield" and "Lowlands" areas, shown in Figure 5, separates two quite distinct landscapes. The "Shield" area has a hummocky topography with thin soil cover, rock outcroppings, and many lakes and small wetland scattered throughout. The "Lowlands" area has a flatter topography with more soil and fertile lands and a number of large wetland areas. There is a blended transition between the two that runs through the south part of Lanark Highlands, Mississippi Lake and the centre of Mississippi Mills.

The west part of the watershed with its rugged Shield area retains most of its forest cover and wetlands, while the east Lowlands area is characterized by urban settlement and agricultural lands, with relatively limited remaining forest cover and fewer, but larger, wetlands.

*Figure 4: Location of the Mississippi River Watershed*



## Facts about the Watershed's Physiography

Physiographic Regions:

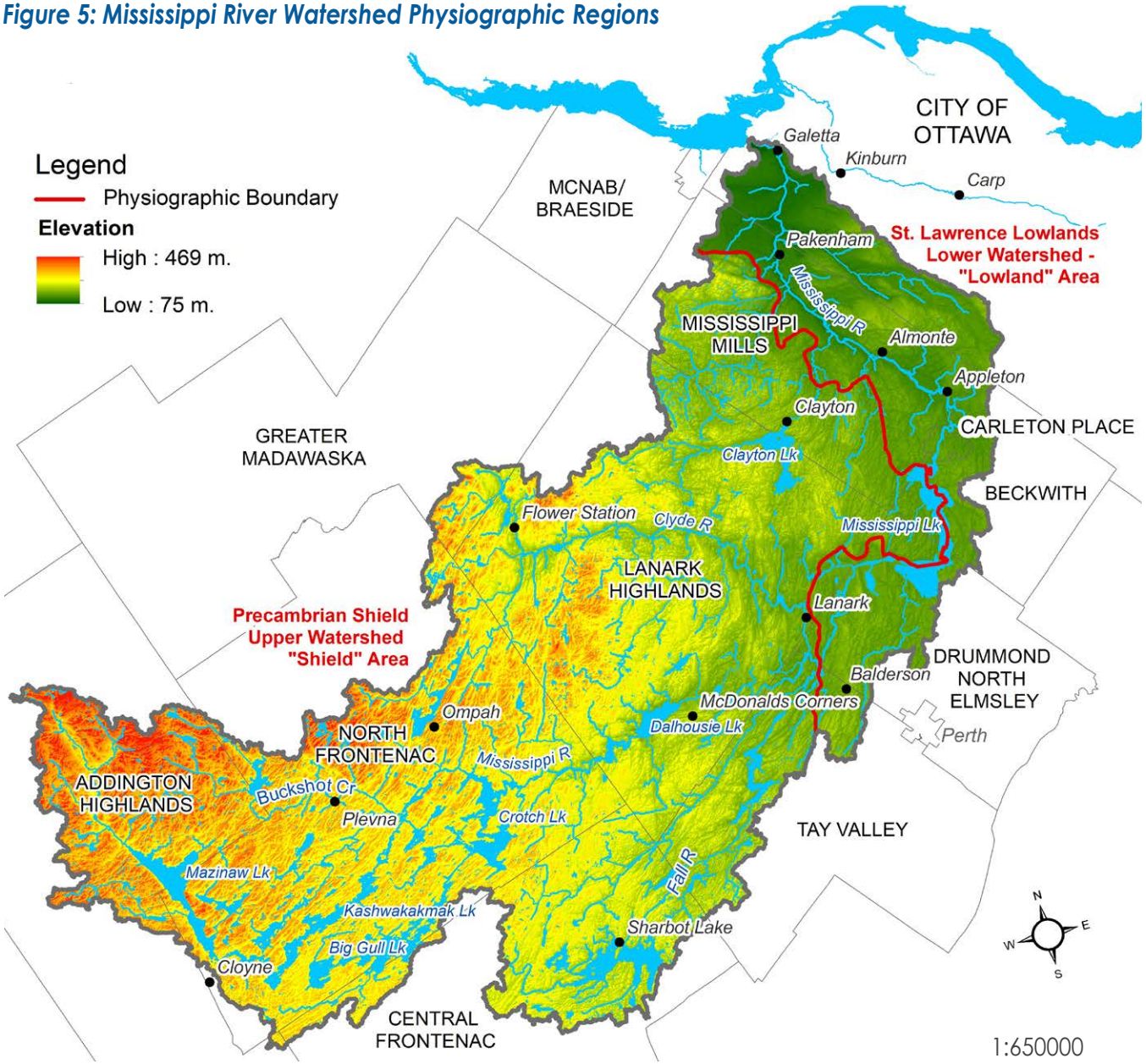
**(Canadian) "Shield" – West**

- covers 82% of the watershed
- rugged, hummocky topography
- 70% forested, 12% wetland, 8.5% water
- hundreds of lakes and streams
- numerous small wetlands
- thin soils and exposed bedrock
- deeper till (sand and gravel deposits) in Balderson, Lanark and Snow Road area

**(St Lawrence) "Lowlands" – East**

- covers 18% of the watershed
- flatter topography
- 40% agriculture, 30% forested, 14% wetland, 4.5% water
- larger river valley and just one lake – Mississippi Lake (on transition)
- a number of large wetlands
- more soil cover and diversity of soil types
- viable farm land

*Figure 5: Mississippi River Watershed Physiographic Regions*



# The Aquatic and Terrestrial Landscapes

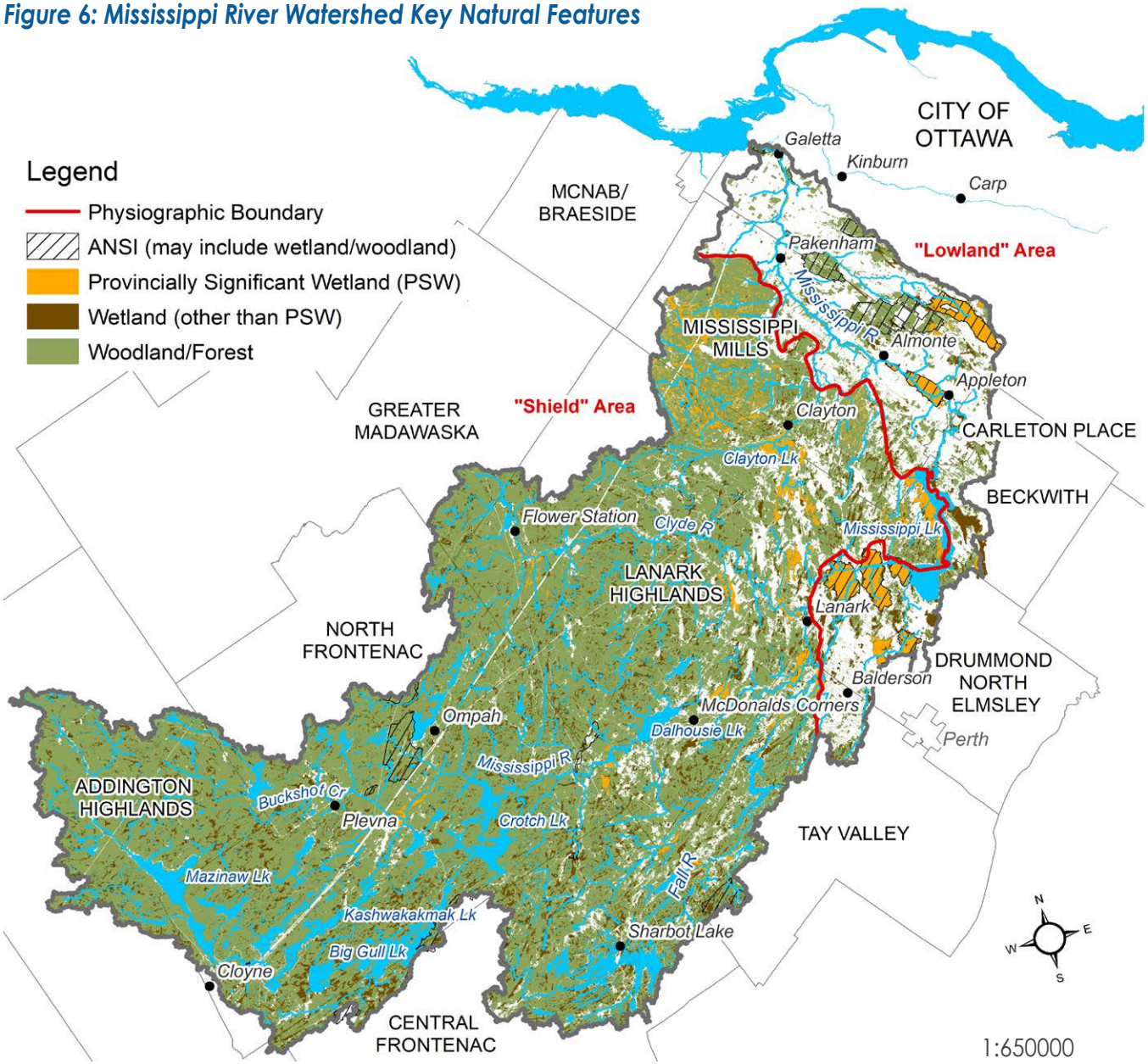
The large contiguous expanses of natural area in the west (Shield) watershed, and smaller fragmented pockets of natural area in the east (Lowlands) support a diversity of aquatic and terrestrial environments. The interconnected system of lakes, rivers, riparian areas, wetlands, woodlands and wildlife habitat, embodies the interdependence of these features. To maintain biological diversity, ecosystem services, species populations, and resiliency to climate change, these features must continue to function as a system.

A number of key natural features are shown in Figure 6 with some facts presented below.

## Facts about the Natural Features and Systems

| | |
|---|---|
| Mississippi River | 212 km |
| Tributary Length | More than 7,100 km (includes smaller rivers, streams and creeks) |
| Number of Lakes | More than 250, mostly west watershed (Shield Area) |
| Wetland Area | Entire watershed – 13% wetland;<br>Shield Area 14%, Lowlands Area 12% |
| Woodland Cover | Entire watershed – 64% woodland;<br>Shield Area 72%, Lowlands Area 31% |
| Forest Interior Cover | Entire watershed – 23% interior forest;<br>Shield Area 27%, Lowlands Area 7% |
| Areas of Natural and Scientific Interest (ANSIs) | 22 ANSIs (13 Provincially Significant, 9 Regional, Local or Scientific Candidate) |

***Figure 6: Mississippi River Watershed Key Natural Features***



There are numerous other natural and cultural features that are not shown in Figure 6. The examples listed below are features that MVCA is aware of and/or that have been of significance to various aspects of MVCA's work. There will be numerous other natural and cultural features that are not listed here, that also hold natural and/or cultural significance.

- **Species at risk:** there are roughly 30 documented Species at Risk (SAR) within the watershed including plants, reptiles, fish, birds and mammals. This number is based on available information but due to the sensitivity of SAR information, the actual number of species may be different.
- **Specialized aquatic features:** including cold water lakes and streams, and walleye and trout spawning areas that provide specialized and sensitive habitat and are located mostly in the west.
- **Significant wildlife habitats:** this includes sites where species seasonally congregate, like the Mississippi Lake Migratory Bird Sanctuary and heron rookeries.
- **Rare vegetation communities; and other specialized habitats, or habitats of species of conservation concern** such as snake hibernacula.
- **American Eel:** is an endangered species that once thrived in the Mississippi River System. Monitoring and research initiatives suggest there is potential for repopulation with the construction of passageways at dam sites.
- **Wild rice:** is a very valuable grain that has been used by Indigenous Peoples as food, for thousands of years. It holds enormous cultural importance to First Nations communities. In Ontario, regulations falling under the Ministry of Natural Resources and Forestry prohibit the commercial harvest of wild rice without a permit. The key stressors potentially impacting wild rice are shoreline development, water levels and climate change.
- **Historically significant places:** there are places in the watershed that hold sacred importance for Indigenous Peoples. An extensive collection of pictographs on the face of Mazinaw Rock is one example.

### EcoRegions

The province uses EcoRegion delineations to determine policy direction for Natural Heritage features and systems. An ecoregion is an area defined by its environmental conditions, especially climate, landforms, and soil characteristics. The Provincial Policy Statement (PPS, 2020) policies reference EcoRegions 5E, 6E and 7E. The Mississippi River Watershed includes EcoRegions 5E and 6E. EcoRegion 5E generally corresponds to the mapped Canadian Shield area, and EcoRegion 6E, to the St. Lawrence Lowlands area, with some very minor deviations. EcoRegion 7E is located to the southeast, outside of the Mississippi River Watershed.

## The Human Landscape

Anishinaabe Peoples were the first to inhabit the Mississippi River watershed and surrounding areas. There are a number of historically significant places in the watershed that continue to hold sacred importance to Indigenous Peoples, who live in and/or maintain a connection to the area. After the War of 1812, Europeans colonized the area, beginning with British soldiers and followed by immigrants from Scotland and Ireland. The watershed has supported decades of economic development largely focused on timber and agriculture, and the river itself, which provided power for sawmills, flour mills and woolen mills.

The proximity to Ottawa has contributed to continued urban and rural estate lot type growth in the east watershed, whereas the "cottage country" of the Shield area has continued to attract waterfront development. As of 2016, the watershed had a population of approximately 42,425, with more than half residing in Carleton Place (25%) and Mississippi Mills/Almonte (30%).

There is a large seasonal population (cottagers) that is not accounted for in the Statistics Canada Census data. Estimates derived for Frontenac County, where cottage properties are prevalent, range from a 250% increase during cottage season (Central Frontenac) to almost six times the year-round population for North Frontenac (Watson and Associates, 2014).

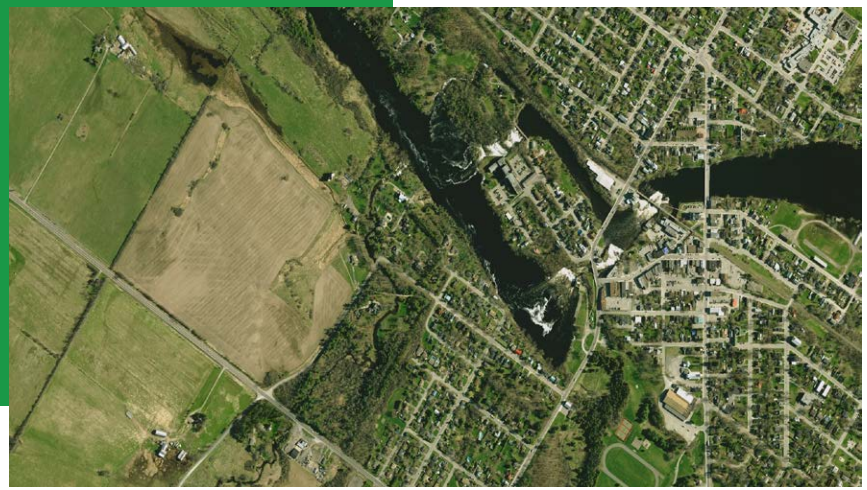
Some basic population and property facts are presented to the right. There are over 31,000 individual properties within the watershed of which about 8,500 (27%) are waterfront. In the east, most waterfront properties have year-round homes. In the west, cottages predominate, with a steady rate of conversions to permanent use.

Local municipal Official Plans designate 'Settlement Areas' where future growth is to be directed. Carleton Place and Almonte, the largest urban communities in the watershed, continue to attract growth to and around them. The populations of Drummond/North Elmsley and Mississippi Mills are projected to increase by 60% between 2016 and 2038, and Carleton Place and Beckwith Township are projected to almost double over the same time frame.

## Facts About Population and Property

| | |
|---|---|
| Watershed Population (2016 Census) | 42,425 |
| Seasonal Population | Estimated 2.5 to 6 times greater than the year-round population |
| Total Properties (2018 municipal assessment) | 31,361 |
| Waterfront Properties | 8,500 (27% of total) |
| Population on municipal water and wastewater services | 37% (Carleton Place and Almonte) |
| Population on private water (well or surface intake) and wastewater services (septic system) | 63% |
| Crown land | 21% of total watershed |

Almonte aerial view showing town and agricultural land.



## Water Supply

Carleton Place and Almonte are the only two settlement areas within the watershed that are fully serviced with municipal water and sewer/wastewater systems. Combined, they account for 37% of the population. The Town of Mississippi Mills supplies drinking water to Almonte residents from five municipal wells. Carleton Place supplies drinking water from a surface water intake at its water treatment plant located on the Mississippi River, 900 metres downstream of Mississippi Lake. Throughout the rest of the watershed there are also a number of communal wells and designated facilities for nursing homes, schools, and similar facilities that supply drinking water to the public. All other settlement areas and rural residents, representing roughly two-thirds of the watershed's population, rely on private septic systems with either private wells or private surface water-intakes.

## Land Use

Figure 7 shows the distribution of primary land uses across the watershed, highlighting the differences between the Shield and Lowlands areas. This illustrates the dominance of forest, lakes and cottage country in the west, and the mix of agriculture, rural and urban development in the east.

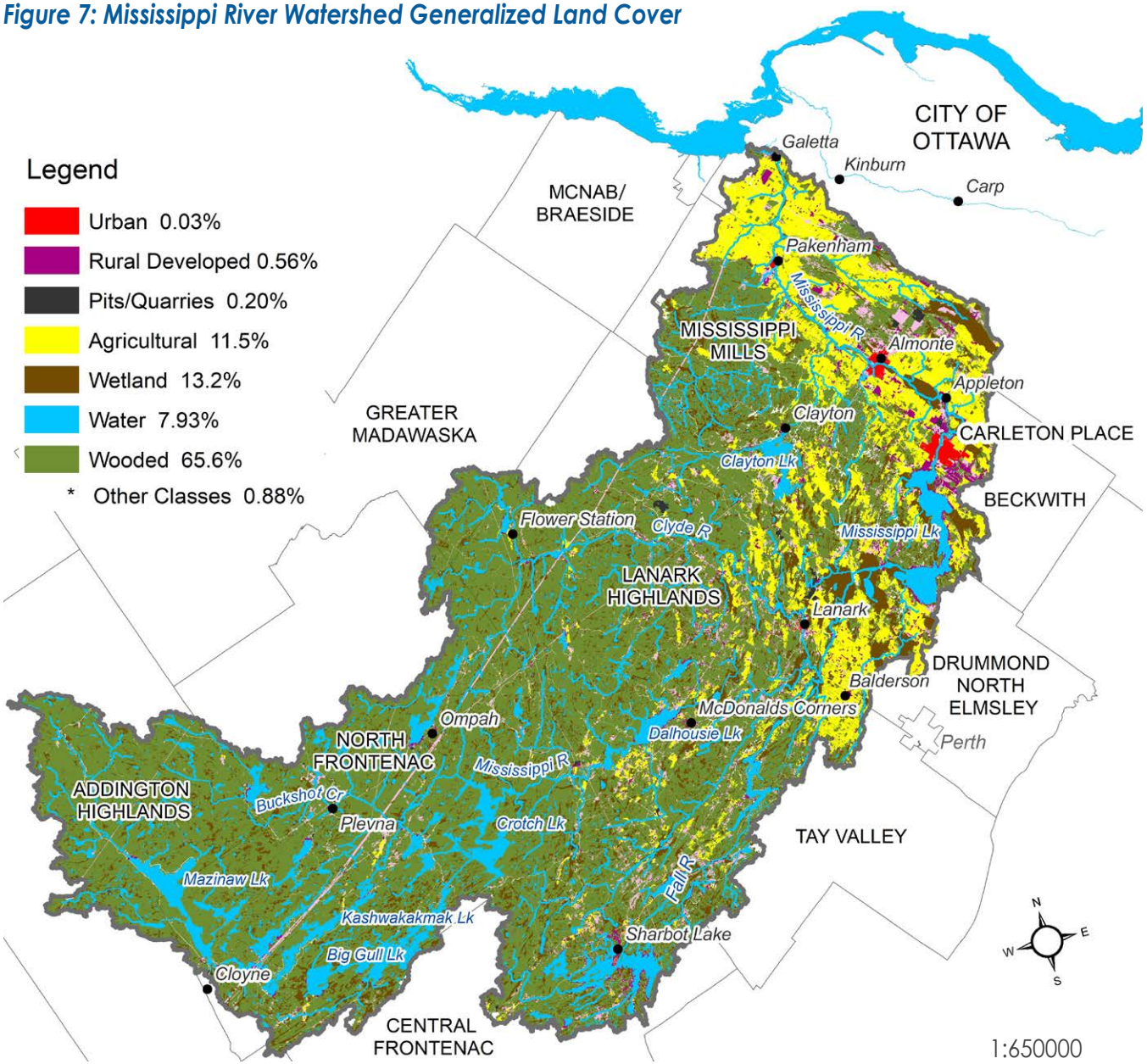
## Crown Land

Crown land is land that is owned by the province, and much is managed by the Ministry of Natural Resources (MNRF). Some of this Crown land, meanwhile, is managed by the Ministry of Infrastructure. Crown land makes up 21% of the total watershed area, and except for the Burnt Lands Provincial Park near Almonte, it is mostly located in the Shield area.

Crown lands are managed under a number of designations such as Conservation Reserve, Enhanced Management Area and General Use Area. Area specific land use plans incorporate key cultural, ecological, social and economic values. There may be opportunity to work with the province in identifying crown lands that are rich in ecological services and should be conserved over the long term.

The Ministry of Environment, Conservation and Parks (MECP) is currently in the process of establishing a new provincial park around Crotch and Fawn Lakes, and parts of Pine and Big Gull Lakes and is in land claim negotiations with First Nations.

***Figure 7: Mississippi River Watershed Generalized Land Cover***



# 3 Actions and Strategies

This section identifies the strategies developed through stakeholder consultation, to address the issues facing the Mississippi River watershed. It is presented under eight headings as listed below, which are the key themes of the eight watershed plan goals. The first three, Integration and Collaboration, Climate Change, and Growth and Development represent "overriding" themes that are reoccurring throughout the five program area themes.

### Overriding Themes

- Integrated Management and Collaboration
- Climate Change
- Growth and Development

### Program Area Themes

- Water Management
- Natural Hazards
- Water Quality
- Natural Systems and Land Conservation
- Education, Outreach and Stewardship

For each theme, an overview provides: key facts; agency roles and responsibilities (where applicable); and watershed management considerations. Strategic actions are presented in table format at the end of each theme section. A list of challenges is also presented for each of the five program areas which include challenges that relate to Climate Change and Growth and Development.

The theme of Integrated Management and Collaboration is carried throughout each of the five program areas. For each strategic action, the agencies that have a role in its implementation are listed under 'Partners'. The role of each partner will vary from strategy to strategy, ranging from sharing of information, to funding partner, to action/program lead. Such roles will be established through discussions with relevant partners during subsequent implementation planning.

A presentation to the public


# Integrated Management and Collaboration

STRATEGIC GOAL
**"To collaborate with watershed partners in promoting an integrated and consistent approach to the health and management of the watershed and water resources."**

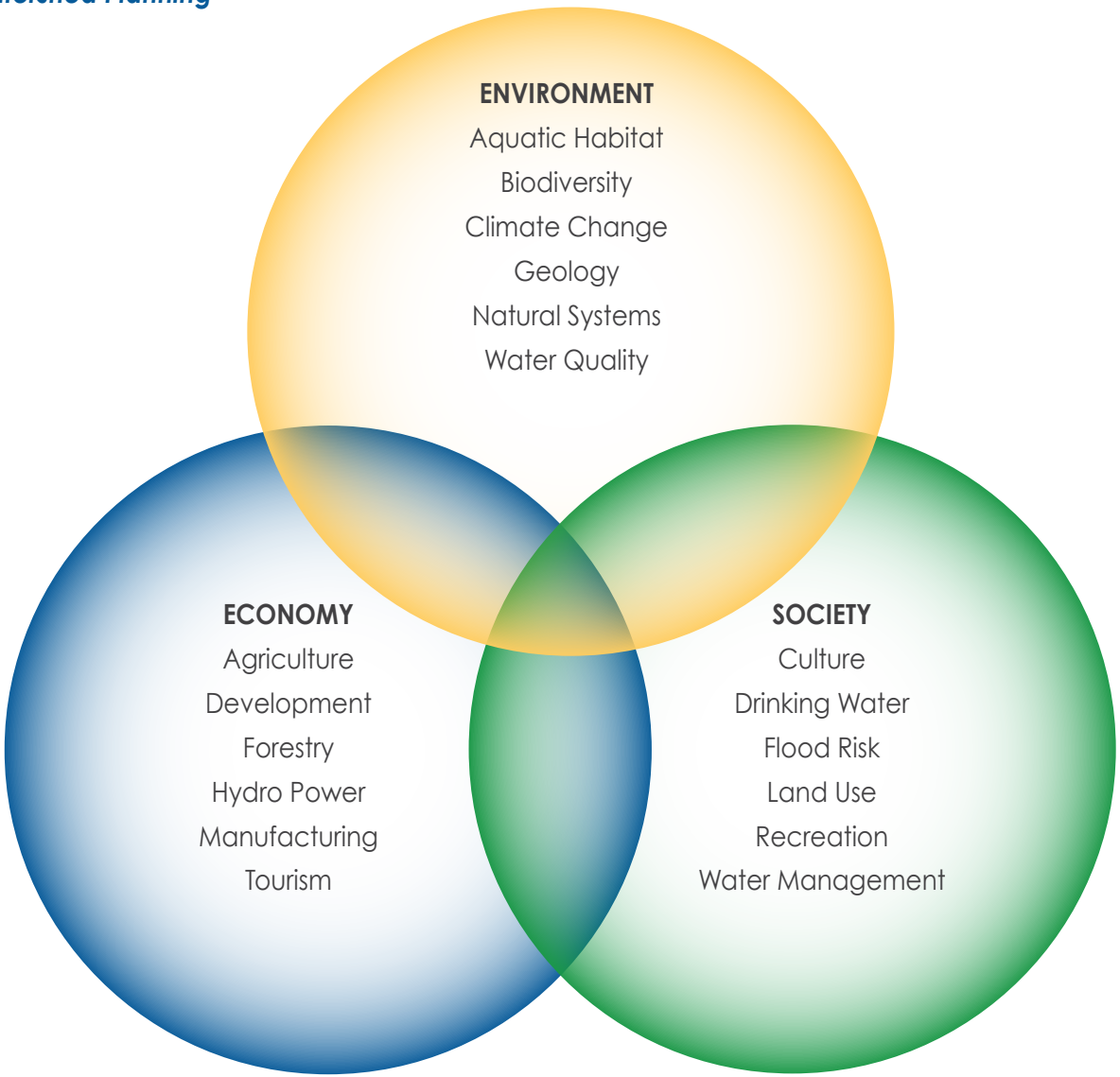
Objectives:

- Develop a plan that integrates all relevant aspects of watershed management and planning.
- Clarify responsibilities for delivering and funding watershed assets, programs and services.
- Cultivate partnerships among individuals, community groups, businesses and government agencies that have a stake in the health of the watershed.
- Develop and strengthen Indigenous partnerships, respecting Indigenous values and rights.
- Establish a coordinated and adaptive approach to watershed management activities amongst government and other partners.

**Overview**
Integrated Watershed Management allows for the management of important water resources, while addressing critical issues such as the current and future impacts of changing land use and a changing climate. Figure 8 shows the multitude of factors that can make up the integrated watershed plan. The features and activities listed in Figure 8 are managed under a suite of legislation, both federal and provincial, that assign agency responsibility, and provide the powers and instruments for implementation. MVCA and its partners also operate under a number of plans, policy documents, guidelines and strategies, each focusing on specific programs or features.

**Appendix B** provides tables listing the agencies that have a role in various aspects of watershed planning and the numerous legislations that provide those agencies the authority and/or tools to implement policy.

***Figure 8: Factors in Integrated Watershed Planning***



## Watershed Partners

A watershed plan should reflect the shared values and priorities of the people living, working, and recreating throughout the watershed. The responsibility for water and resource management falls under a multitude of government agencies and legislation. This opens the door for duplication and overlap, or to fragmented and potentially conflicting approaches to addressing various mandates. It can also lead to confusion amongst the public as to which agency is responsible for what.

With limited resources directed to the environment, it is imperative that watershed partners adopt a collaborative integrated approach to the handling of watershed management concerns. Duplication of effort should be avoided wherever possible, and collaborative partnerships that improve the use of resources and the delivery of services should be promoted. Each jurisdiction has its own mandated responsibilities, and it is important that those responsibilities are clearly articulated and understood, and that the related actions are implemented by the appropriate bodies.

## Public Sector Partners

MVCA works with a number of public sector partners in carrying out its watershed responsibilities. Direct partners include the eleven member municipalities, who appoint members to the MVCA Board of Directors, and the Province, through the Ontario Ministry of the Environment, Conservation and Parks (MECP)and the Ontario Ministry of Natural Resources and Forestry (MNRF). The direct partners provide financial support, with more than 50% of the funding coming from the municipalities and the remaining from the province, fees for service, special levies, and grants.

MVCA also has agreement relationships with a number of agencies to provide delegated services. MVCA has an advisory role in providing municipalities with review and comments on land use planning applications made by property owners. As a public commenting body under the *Planning Act*, MVCA has Memorandums of Agreement with both the County or Lanark and the City of Ottawa to address "Provincial Interests" related to Natural Heritage Features and to provide comments that are in the publics best interest. MVCA also has collaborative relationships with organizations involved in other aspects of watershed management. For example, MVCA collaborates with MECP in implementing

the Provincial Water Quality Monitoring Program and with the County of Lanark to help manage its Community Forests program.

## Indigenous Communities

This Watershed Plan provides an excellent opportunity to develop and strengthen relationships with the Indigenous Peoples that have a long-standing connection and relationship with the watershed. MVCA views Indigenous engagement as a key factor to developing a balanced watershed plan and is working with an Indigenous Consultant to implement an Indigenous Engagement Plan to guide this process.

## Non-Government Organization (NGO)

MVCA also shares environmental protection and resource management interests with many Non-Government Organizations (NGOs), local groups and associations. It has collaborative relationships with universities, many lake associations, and a variety of stewardship organizations. These collaborations become increasingly important as Provincial resources and services continue to diminish at the local level. See Appendix A for a listing of MVCA's existing and potential non-government partners.

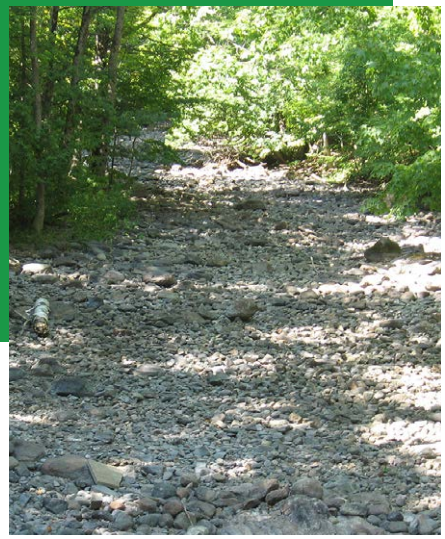
Collaboration is an overriding theme that is carried throughout this Plan. For each watershed plan action, opportunities for partnership and collaboration have been considered and where practical, included as part of the strategy.

Flood Clyde River Sandbagging (source cbc.ca)

## Collaboration Strategic Actions

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **IMC1** | Extend the role of the MVCA Public Advisory Committee (PAC) for the implementation and updating of the Watershed Plan. | MVCA<br>All sectors and communities represented on the PAC (Page 6) | May be made mandatory through 2021 changes to *Conservation Authorities Act*.<br>Will require revised PAC Terms of Reference to clarify roles, responsibilities and terms of engagement. |
| **IMC2** | Undertake meaningful engagement and establish new relationships with Indigenous partners through implementation of an Indigenous Engagement Plan and through ongoing engagement in watershed initiatives. | MVCA<br>Indigenous Communities | Indigenous Engagement Plan (IEP) has been prepared and is being implemented as this Plan is adopted.<br>Following completion of the IEP, the Plan will be reviewed and amended where needed to incorporate Indigenous considerations.<br>The intent is to continue engagement, collaboration and relationship building throughout and beyond the implementation of this Plan. |
| **IMC3** | Continue to collaborate with and promote collaboration among lake associations through networking groups, direct partnerships and stewardship programs. | MVCA<br>Lake Associations and Networks<br>Federation of Cottage Associations (FOCA) | The North Frontenac Lake Association Alliance and The Lake Networking Group are key conduits to grassroots collaboration.<br>Collaborations can include:<br>• Monitoring and stewardship initiatives<br>• Educational workshops, materials and tools<br>• Scientific research projects<br>• Technical and advisory support in developing lake plans |

2012 Drought – Conditions in the Fall River downstream of Sharbot Lake



# Climate Change

STRATEGIC GOAL
**"To increase our resiliency and adaptive response to climate change."**

Objectives:

- Improve our understanding of climate change impacts in the Mississippi River watershed.
- Improve local resiliency to changing climatic and extreme weather conditions.
- Incorporate climate change considerations into planning and management decision-making tools, guidelines, plans and policies.

**Overview**

Climate change has emerged as a prominent focus in developing sound watershed management strategies to guide us through the coming decades. It is an overriding consideration throughout this entire document with many of the strategic actions aimed at building resiliency to extremes in climate and weather through improvements to water management and storage, and protection of natural features.

The MVCA has been a leader among the eastern Ontario Conservation Authorities in looking at climate change impacts from a water management perspective. Beginning in 2007, MVCA collaborated with local experts and stakeholders on a local climate change adaptation initiative (Egginton, P. and B. Lavender. 2008). MVCA subsequently partnered with the province, universities and others on a variety of research projects to undertake vulnerability assessments of:

- fish populations (Casselman, et.al 2011)
- wetlands (Ministry of the Environment and Climate Change, 2014)
- water budget impacts (Kunjikutty, 2014)
- small waterpower facilities (Lehman, et.al, 2015)

## Projected Local Climate Change Impacts

- Increased flooding and erosion, and early spring flooding (freshet)
- More frequent and prolonged drought conditions and more frequent severe weather
- Reduced winter snow cover and river/lake ice
- Water quality changes (ex. warming and increased algae blooms)
- Decreased soil moisture during the growing season
- Reduction in (drying of) wetland areas
- Increases in invasive species, plant pests and diseases
- Changes in aquatic species (more warm water/less cool water species)
- Changes to forest composition and species affecting ecosystem processes and the forest industry

For the Mississippi River watershed, in addition to increases in average annual air temperatures, climate change models project more frequent and extreme rainfall events, an earlier spring freshet, prolonged periods of low summer flow, and more frequent drought-like conditions. Patterns of earlier onset of spring freshet and reduction in the summer low flow season have already been observed in the watershed. The Mississippi watershed has experienced six large floods since 1998, and four droughts, since 2012. Recent occurrences of Harmful Algae Blooms (HAB) on Mississippi and Dalhousie Lakes may be attributed to warmer temperatures in the early fall.

In Ontario, the MECP is the lead agency responsible for overseeing provincial preparedness for climate change. The 2018 A Made-in-Ontario Environment Plan outlines the Province's plan to help communities prepare for climate change. The Plan commits to updating policies and building partnerships to improve local climate resilience through improved flood-proofing measures, resiliency in infrastructure, and support for agriculture/food sector resiliency.

Under the Provincial Policy Statement (2020) for managing growth and development, municipalities are required to prepare for the impacts of a changing climate by:

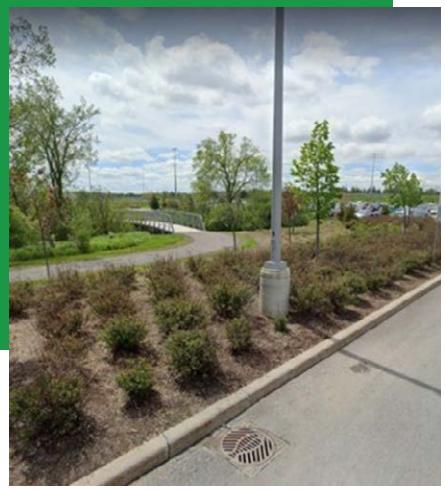
- Incorporating efficiencies in their infrastructure and public service facilities;
- Planning for sewage and drinking water services, and stormwater management (including the use of green infrastructure);
- Protecting, improving or restoring the quality and quantity of water by evaluating and preparing for the impacts of a changing climate to water resource systems at the watershed level; and
- Mitigating potential risk to public health or safety or of property damage from natural hazards, and preparing for increased risks associated with natural hazards.

## Climate Change Strategic Actions

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **CC1** | Apply a climate change lens to all strategic directions within this Plan. | All Partners and Stakeholders listed throughout this Plan | The climate change lens may include:<br>• Monitoring, modelling and analysis of potential impacts.<br>• Determining needs and options for building local resilience, mitigation and adaptation.<br>• Incorporating adaptive and mitigative measures in watershed management activities.<br>• Promoting enhanced carbon capture and reduced carbon footprint throughout the watershed. |

**Note:** As a key overriding theme, many additional strategic actions presented in this document are directed at improved resiliency and adaptation to the implications of climate change.

Low Impact Development (LID) features at Tanger Outlet Mall, Ottawa



# Growth and Development

STRATEGIC GOAL
**"To support environmentally sustainable growth and economic development."**

Objectives:

- Monitor and report on watershed conditions.
- Quantify water use trends and needs by sector and establish priority needs and management practices under extreme conditions.
- Work with watershed partners to develop and implement best practices in the watershed.

**Overview**

Growth and development are tied to a number of economic sectors including agriculture, development (residential, industrial and commercial), forestry and tourism. The Mississippi River watershed is mostly rural with urban development in and around Carleton Place and Almonte, and rural estate-lot growth in the surrounding municipalities. Proximity to Ottawa has been a large contributing factor to growth in this part of the watershed. The 2011 and 2016 Statistics Canada Census data for these municipalities show growth rates at three times the Provincial average. The growth is expected to continue, with Carleton Place and Beckwith populations projected to almost double between 2016 and 2038, and Drummond/ North Elmsley and Mississippi Mills increasing 60% over that same period.

Local municipal Official Plans designate 'Settlement Areas' where future growth is to be directed. Of those, only Carleton Place and Almonte have municipal water and sewer systems. Much of the current growth throughout the watershed is taking place outside of designated settlement areas, in areas without municipal services. Higher concentrations of estate-lot type development on private services (well and septic systems) present potential concerns with respect to groundwater availability and contamination. Through the Source Protection program, most of the watershed has been identified as "Highly Vulnerable Aquifer" suggesting that, over much of the watershed, contaminants

could travel quickly into the aquifers and potentially cause risk to users drawing drinking water from those sources. This is a concern for private wells in the rural parts of the watershed where an estimated 63% of the permanent population use groundwater wells for their drinking water. The high growth areas also contain some of the largest wetlands and groundwater recharge areas of the east watershed, where development has the potential to negatively impact hydrologic conditions.

With development, the loss of wetlands, forest cover and riparian buffers can cause increased soil erosion, impairment of water quality; reduced terrestrial and aquatic habitat; and impaired ecological function (see strategies under Water Quality and Natural Systems). Increased impermeable surfaces also reduce natural infiltration, causing higher runoff surges and more pollutants and sediments flushed into the water.

## Municipal Development Infrastructure

The eleven local municipalities are responsible for a range of infrastructure including: water and wastewater facilities, sanitary and stormwater collection systems, roadways and culverts, and management of public lands. Proper drainage, adequate water supply and good water quality are key infrastructure concerns. With the high growth rates, the eastern municipalities are experiencing increased drinking water, stormwater management and other servicing demands. Asset Management Plans and integrated infrastructure planning are needed to ensure the integrity and appropriate design and operation of water and erosion control structures, municipal water systems, road structures, and drainage infrastructure.

## Waterfront Development

Almost one third of the properties in the watershed are waterfront. The numerous lakes and rivers continue to attract development. With relatively few vacant waterfront lots remaining, waterfront development primarily takes the form of enlargement and/or conversions of seasonal cottages to year round homes. There is ongoing pressure for infill development of properties and areas formerly deemed unsuitable for development because of environmental and physical constraints. Second tier (back lot) developments are also becoming more common.

## Water Management Tools for Sustainable Growth and Development

- Protection of wetlands, for natural storage and other benefits
- Riparian buffers along all waterways including natural features (lakes, rivers, streams), and manmade features (municipal and agricultural drains)
- A 30 metre setback from water (normal high water mark) for structural development and hardened surfaces
- Implementation of low impact development measures (LIDs)
- Protection of natural features and systems

Provincial and municipal planning documents implement a 30 metre "normal high water mark" setback as the minimum distance needed to protect water quality and the aquatic environment. About 3,450 homes/cottages, and another 3,450 auxiliary structures (i.e. garages and sheds) are within the 30 m setback. Some municipalities implement grandfathering provisions allowing for intensification of existing development within the setback. Much of MVCA's municipal plan review service focuses on reviewing applications for development within the 30 m setback area, and trying to work with municipalities to limit further development in this critical area and to achieve a net environmental gain.

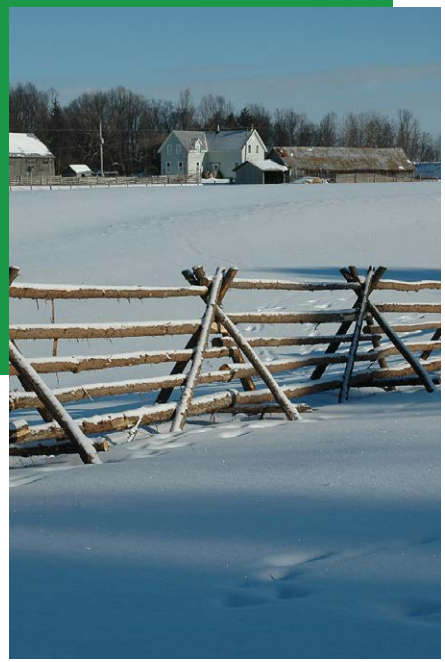
Where the development involves construction, grading or other work on shore or in the water, such as erosion control structures or two-storey boathouses, approvals may also be required from the MNRF under the *Public Lands Act*. The multijurisdictional review of development applications (municipalities, conservation authority, provincial agencies, etc.) can be difficult and cumbersome for applicants to navigate. For shoreline and in-water works, confusion about regulations with regard to which agencies must be involved, and when and where certain regulations apply, is an ongoing issue. Improvement is needed to ensure development review processes are understood and followed, and are timely, effective, and balanced.

## Agriculture

Agricultural land is found throughout the watershed. Most is located in the Lowlands area downstream of Mississippi Lake, where one-third of the land is used for farming. Crop (grain and oilseed) production is the prominent agriculture, but farmlands are also used for dairy and beef cattle and other livestock, maple syrup production, market gardens, and specialty farming operations – a fast growing sector.

The shift from livestock farming to crop farming has led to the consolidation of farmland holdings. Increasing field size has required the removal of hedgerows, woodlots, and wetlands, and changes to drainage features. Practices to drain wetland areas, and to move water quickly off the land in the spring (ex. increased tile drainage) can increase flooding and erosion in the receiving water bodies. Such practices can also impair water quality through sedimentation and the flushing of nutrients and other pollutants into waterways.

Collaboration with the agricultural communities



With mutual goals of sustained water availability (storage, infiltration) and healthy soils, there are opportunities for greater collaboration between MVCA and the agricultural community. This is particularly relevant as we collectively contend with the impacts of climate change which project: more frequent extended wet spring conditions, causing delayed and poor planting; more frequent extreme weather events, causing soil erosion and flushing of nutrients; and more frequent extended hot and dry summers during peak growing seasons. Land use practices that improve the natural storage and infiltration of water are a key priority that can benefit both parties. Priorities include: the design of good agricultural drainage practices; the provision of riparian areas and vegetated buffers next to waterways; and the maintenance/creation of wetland features for water storage.

## Forestry

The Mississippi River watershed is two thirds forested. As well as providing economic, recreational and social benefits, forested lands play a vital role in lessening flooding and erosion, and protecting water quality by filtering runoff. Most of the forest cover is in the west with much less in the east, where the woodlots are generally unconnected fragmented patches. About 70% of the forest is on private land, 28% on crown land, and 2% on municipal/county lands and land trust managed properties. The Ministry of Natural Resources and Forestry (MNRF) manages timber harvest on crown lands. In private woodlots, forestry is generally not regulated and harvest is permitted without license unless the stand is deemed significant under other legislation (ex. significant wetland, or subject to a municipal tree cutting by-law). A key watershed plan consideration with respect to forestry is the management of forests on private lands, particularly in the east part of the watershed where forest cover, forest interior and forested corridors are more scarce.

## Tourism

The Mississippi River watershed offers many nature-based attractions that support tourist operators that are directly marketing an outdoor recreation experience. By attracting visitors to the area, it also generates numerous secondary benefits (grocery, restaurant, gas, other accommodation, etc.). Local tourism is largely focused on the recreational opportunities provided by the many lakes, rivers, and vast areas of crown land. Private

water recreation focused businesses such as resorts, camps, fishing expeditions, marinas and canoe/boat rentals, are mostly located in the west part of the watershed and on Mississippi Lake. The industry depends on the sustained integrity of the lakes and rivers, shorelines, crown land and other natural areas, and vistas and viewscapes.

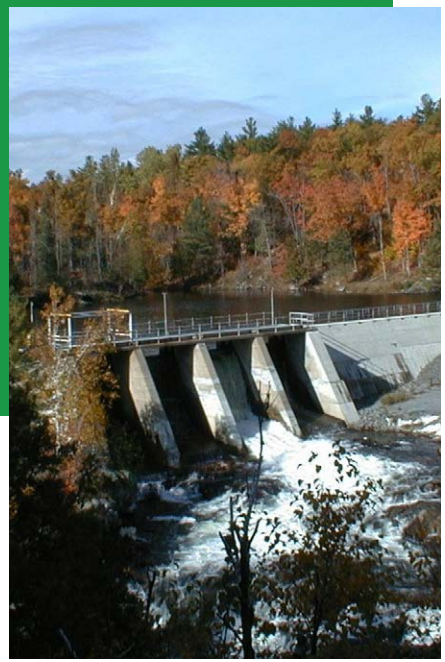
As a largely outdoor recreation-based industry, local tourism is vulnerable due to a number of environmental and human-induced factors that are beyond the control of the tourism operator. Key challenges relate to both climate change and changes in land use, with resulting impacts to water levels, water quality, aquatic habitats, fish and wildlife health and populations, shoreline aesthetics/health, and the quality and availability of natural landscapes.

## Growth and Development Strategic Actions

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **GD1** | Work with all partners to continue to support environmentally sustainable growth for risk mitigation and the protection of watershed values and features. | All partners and stakeholders listed throughout this Plan | Key tools for environmental sustainability are:<br>• the protection of wetlands, for natural storage and other benefits<br>• riparian buffers along all waterways including natural features (lakes, rivers, streams), and manmade features (municipal and agricultural drains)<br>• the 30 metre setback from normal high water mark for structural development and hardened surfaces<br>• the promotion of low impact development measures (LIDs)<br>• the protection of natural features and systems |

**Note:** As a key overriding theme, many additional strategic actions presented in this document are directed at environmentally sustainable management of growth and development.

Crotch Lake Dam



# Water Management

STRATEGIC GOAL
**"To use and manage both surface water and groundwater wisely to meet current and future needs under normal and extreme conditions."**

Objectives:

- Expand our understanding of the water budget of the Mississippi River watershed and the potential impacts of climate change.
- Maintain and enhance the hydrologic balance, including baseflow, groundwater quantity, recharge and discharge, within the Mississippi River watershed.
- Provide water storage throughout the system to improve resiliency during low water/ drought events.
- Work with watershed landowners, communities and industry to balance competing demands for water use in a sustainable manner.

**Overview**

While at the local level, MVCA is the lead in water management, the federal and provincial governments, and municipalities, also have roles and responsibilities in managing surface and groundwater quantity. Responsibilities include monitoring and managing flows and levels, managing water use, and managing water storage and availability. Figure 9 presents a generalized overview of agency roles and Appendix B Table 1 lists the legislation relevant to those roles. (See also Water Quality.)

The Mississippi River is a "managed system", with a series of water control structures (dams and weirs) that are used to regulate water flows and levels for a variety of purposes. In 2006, the **Mississippi River Water Management Plan** (MRWMP) was developed by the Ministry of Natural Resources (MNRF), hydro power producers, and MVCA in accordance with the *Lakes and Rivers Improvement Act*. The plan documents operating ranges (upper and lower water level/flow targets) and management strategies for the major water control structures along the river system.

***Figure 9: Agencies Involved in Water Management***

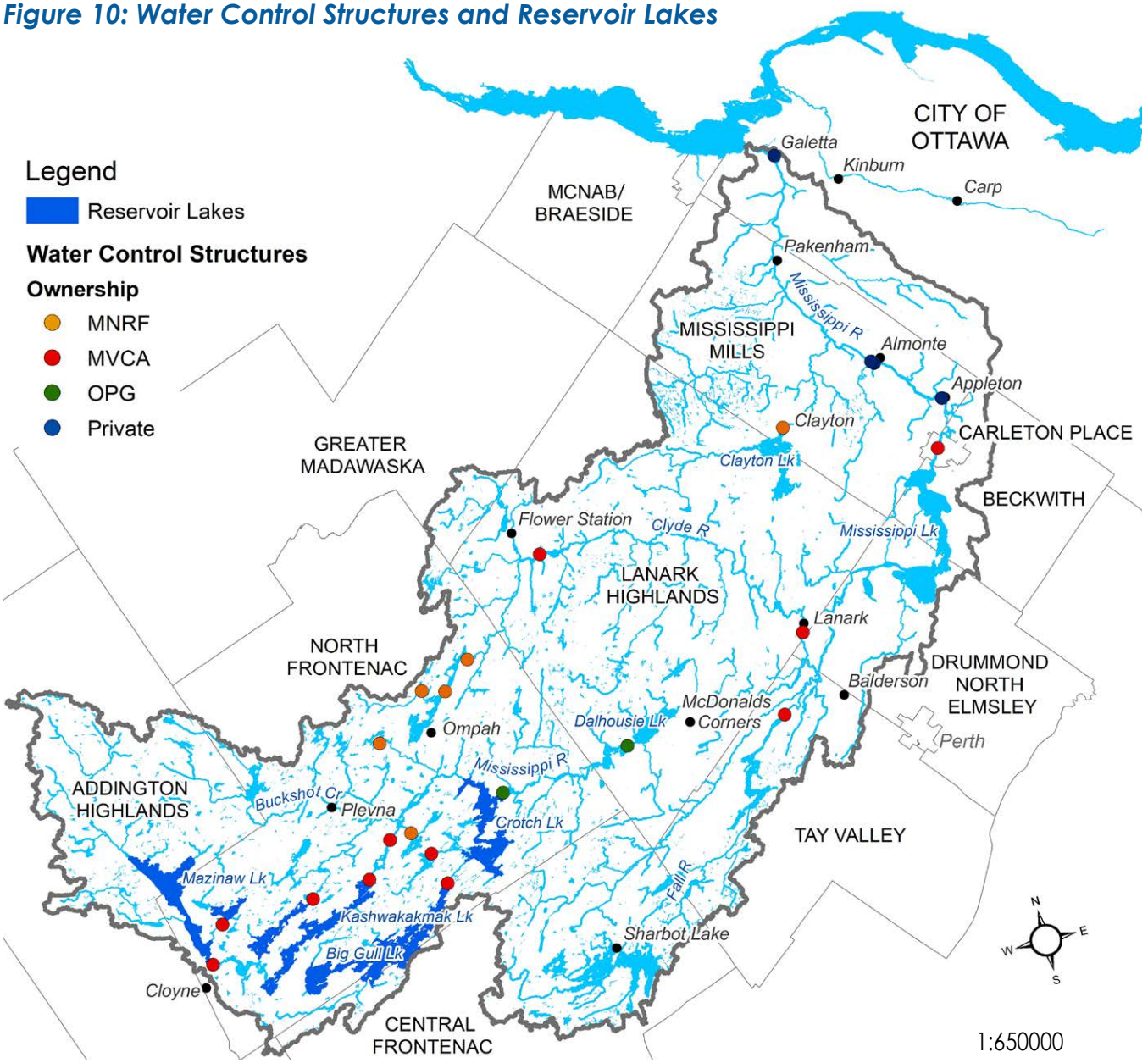
| | |
|---|---|
| Managing Flow/Levels | • **MNRF:** Water Management Plans (WMPs)<br>• **CAs:** WMP Implementation<br>• **Municipalities:** Stormwater management |
| Monitoring Flow/Levels | • **Surface Water:** CAs, MNRF, WSC, Hydropower facilities<br>• **Groundwater:** MECP, Municipalities |
| Managing Storage and Availability | • **CAs:** dam operations, wetland regulation<br>• **Municipalities:** Infrastructure design (infiltration), Wetland and natural area protection |
| Managing Use | • **MECP:** Water taking permits<br>• **Municipalities:** Water conservation measures/directives<br>• **Low Water Response Team**: (Many partners) |

**Water control structures:** MVCA, the MNRF, and hydro producers own and operate a series of dams along the system (Figure 10). The structures are operated for several purposes: to mitigate flooding, erosion, and ice hazards; to provide low flow augmentation; to support recreation, fisheries, and tourism; and to enable sustainable power generation. The MRWMP gives particular consideration to wild rice beds, and lake trout and walleye spawning habitats as all three are highly sensitive to water level fluctuations.

**Reservoir lakes:** shown in Figure 10, six lakes in the west part of the watershed are used as storage both to mitigate flooding and augment low flows. Crotch Lake is the largest "reservoir lake" and provides as much water storage capacity as the other five lakes combined.

**Gauge network:** MVCA partners with Water Survey of Canada (WSC) and MNRF to collect water level and flow data from a network of river/stream gauges located throughout the watershed. Data is used to inform dam operations, flood forecasting and warning; to conduct trend analysis; and to carry out system planning and dam design.

***Figure 10: Water Control Structures and Reservoir Lakes***



**Generating stations:** owned by Ontario Power Generation (OPG), Enerdu Power Systems, Mississippi River Power, and TransAlta are all "run-of-river" facilities that rely on natural river flows.

The eleven local municipalities are responsible for water supply and management through their water and wastewater facilities, sanitary and stormwater collection systems, and rural municipal drains. Proper drainage, flood mitigation, adequate water supply, and good water quality are key infrastructure concerns. The eastern municipalities are experiencing high growth and development, with increased drinking water, wastewater and stormwater management and servicing demands.

## Stormwater Management

In addition to the management of water flows and levels within the lakes and rivers, stormwater is another component of water management. Stormwater comes from urban areas and rural subdivisions/development where the hardening of surfaces from roads, buildings, driveways, and parking lots reduces the capacity for ground infiltration. Precipitation and snowmelt are rapidly flushed off the surface through drains and ditches that eventually outlet into the nearby lakes and rivers. Stormwater is a prime cause of urban and rural flooding and also a major source of water pollution, particularly road salt.

Under the Provincial Policy Statement (PPS, 2020), municipalities are responsible for ensuring proper stormwater management of new developments. For areas of high growth, master stormwater/drainage planning is a tool available to municipalities to guide the management of drainage and stormwater at a comprehensive scale rather than on a site-by-site, development by development basis. As part of its municipal plan review advisory function, MVCA reviews and advises on large scale developments to try to ensure that the design of drainage and stormwater infrastructure addresses future land use, and considers impacts to receiving waterbodies. This is done on a fee-for-service basis through agreements with the municipality.

## Low Flow and Drought Response

Until recently, extended periods of dry, hot weather and low water levels were relatively uncommon, occurring once every decade or so. However, between 2012 and 2021 the watershed has experienced four notable droughts. Severe drought conditions have far reaching impacts to both the natural environment and to human needs for water availability. It causes stress to forests, wetlands and aquatic environments, and stress for industries such as agriculture and tourism that depend on the availability of water. During extreme conditions, droughts could also impact the Carleton Place water intake and the quality of water entering the plant. Under such conditions, system operators (MVCA and the power producers) may need to adjust water levels elsewhere on the river system to protect the Town's water supply with potential impacts to waterfront properties. The outflow from the wastewater treatment plant to the river also requires enough water (level) in the river for assimilation of waste, especially during the low flow season.

In 2001, the MNRF established the Ontario Low Water Response Program to assist in coordination and support of local drought response. It entailed the establishment of local Water Response Team (WRT) coordinated by the Conservation Authority, and made up of representative water users: member municipalities, farmers, businesses, recreation and others. The WRT communicates when necessary to review stream flow information and weather forecasts in order to officially declare drought status and to assist in messaging and response.

## Climate Resiliency and Natural Water Storage

For watershed managers, water storage is a key building block in providing resiliency to both flooding and droughts. With limited capacity to store water in the reservoir lakes and through the operation of the water control structures, the protection and creation of natural storage is increasingly important. Wetlands are the primary and most obvious form of natural storage. They hold water during high water events/seasons and slowly release it back into the system when it's needed during the low water season. A study by the Intact Centre on Climate Adaptation, University of Waterloo, determined that wetlands left in their natural state can reduce the cost of flood damage by 29% in rural areas and 38% in urban areas (Moudrak, et.al. 2017).

Scotch Corners Provincially Significant Wetland

Surface water storage and the recharge of groundwater supplies can also be increased though Low Impact Development practices (LIDs). LIDs include a range of design features that encourage the on-site retention and infiltration of precipitation and snow melt. Examples include bioretention and rainwater collection features like bioswales, raingardens, rain barrels and constructed wetlands, and the use of permeable surfaces in place of traditional pavement and concrete.

## Wetlands Store Flood Waters, Ease Droughts and Support the Ecosystem

Wetlands are an essential part of a healthy ecosystem. They play a critical role in regulating the movement of water within our watersheds and in doing so they provide numerous benefits to the surrounding area and ecosystem. Wetlands:

- Help regulate water levels, storing water in wet periods and releasing it in dry periods, easing flood and drought impacts
- Regulate the movement of water between the surface and underlying aquifers by recharging and discharging groundwater
- Improve water quality by providing natural filtration systems
- Process nitrogen, produce oxygen and have a high capacity to sequester and store carbon
- Enhance biodiversity and provide habitat for numerous species including more than 1/3 of Canada's species at risk
- Provide important wildlife passage corridors between their habitats

## Challenges

**Dam Operations/Mississippi River Water Management Plan (MRWMP, 2006)**

- With extremes in weather, target water levels/flows are increasingly difficult to achieve.
- The scope of the MRWMP (2006) does not address water quality, changes in climate, or changes in land use.
- Ice (both surface and frazil ice) can impact flow management, hydropower-generation operations, and municipal works, and can damage shoreline properties and structures; increased incidences with climate change.

**Aging Infrastructure**

- The dams are at or nearing the end of lifespans and will require major repair or replacement in the next 10-15 years at an estimated cost of $5.9 million (2020).

**Water Storage**

- Water storage is a key limiting factor in mitigating floods and droughts, and the dams and reservoir lakes have limited storage/ flood control capacity.
- Most storage capacity lies in the west watershed, with little available downstream of Crotch Lake. There is a large amount of "uncontrolled" runoff in the east part of the watershed.
- Natural storage from wetlands and on-site infiltration is being reduced through changes in land use, primarily development and agriculture, that have resulted in filling/draining of wetland areas, and hardened surfaces replacing permeable surfaces.

**Water Availability vs Demand**

- An MVCA Water Budget prepared for Source Protection identified deficiencies in data on groundwater use and supply.
- Droughts have recently been more frequent with potential impacts to quantity and quality at the Carleton Place water intake and groundwater supplies.
- Water levels elsewhere on the system may need to be adjusted to protect Carleton Place water supply; this has implications for water management/allocation.
- Growth is increasing the residential and commercial demand for water, while the environment and economic sectors such as agriculture and tourism also depend on the water availability/levels.

**Municipal Drainage Infrastructure**

- Stormwater - rainfall/snow melt can overwhelm the capacity of municipal drainage collection systems such as ditches, culverts and storm sewers resulting in localized "urban" flooding.

## Water Management Strategic Actions

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **WM1** | Prepare a Mississippi River Watershed Model incorporating historical, near real-time, and projected future hydro-climatic data, based on up-to-date information and science. | MVCA (Lead)<br>Power Producers<br>Universities<br>MECP<br>WSC | Apply new climate change scenarios based on the upcoming Intergovernmental Panel on Climate Change (IPCC) Assessment Report. |
| **WM2** | Update the Mississippi River Water Budget to better evaluate water needs and use and incorporate climate change considerations. | MVCA (Lead)<br>MECP | Complete the recommendations of the MRSPP Tier 1 budget assessment.<br>Actual water takings data is recommended for all percent demand calculations. The Province is currently collecting this information for all permitted users. When data is available, the stress calculations should be updated.<br>Flow monitoring downstream of Appleton is recommended. Should this information become available, stress calculations should be performed again.<br>Establish a centralized system of collecting and consolidating groundwater data collected through existing programs and through the subdivision review process, to support updates to water budget.<br>Assess past drought occurrences to determine impacts on river flow, and the conditions under which the target flows could not be achieved.<br>Undertake a climate change analysis to assess future drought implications and what adaptation/mitigation measures will be needed. |

## Water Management Strategic Actions *(Continued)*

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| | | | Use updated budget to define management objectives and set policy for the allocation or "use" of water.<br>Survey (voluntary) industry partners on a regular basis to maintain up to date information on water use, water needs, and water availability. |
| **WM3** | Undertake a Water Storage Capacity and Management Study that considers both man-made (dams and reservoirs) and natural storage (wetlands) options and capacity. | MVCA (Lead)<br>Universities | Undertake an analysis of climate impacts on existing storage capacity.<br>Natural storage component could be done in-house or as a research collaboration with the academic community.<br>Assess groundwater monitoring and data needs to determine whether current data and related information is meeting with MVCA and municipal requirements to fulfil their obligations for Source Water Protection. If not, work with MECP to address identified deficiencies. |
| **WM4** | Update the Mississippi River Water Management Plan to build on modelling, water budget and storage assessments completed under Actions WM1, WM2, and WM3. | MVCA (Lead)<br>MNRF (Lead)<br>Consulting with Indigenous Peoples, Municipalities, and other major water users[2] | Review the findings of the MVCA Climate Change Implications for Small Waterpower Facilities (2015) study to assist in balancing the competing interests for the watershed's water resources. |

[2] Water users taking more than 50,000 litres of water per day must obtain a Permit to Take Water (PTTW) from the MECP under requirements of the *Water Resources Act*. Permit holders include: municipal water and wastewater treatment facilities, agricultural and aquaculture facilities, campgrounds, construction sites, golf courses, hydropower generators, and pit and quarry operations

## Water Management Strategic Actions *(Continued)*

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **WM5** | Develop and implement an Asset Management Plan for the water control structures. | MVCA (Lead)<br>Municipalities | Asset management system for optimizing infrastructure priorities, considering risk, legislation requirements, and available resources.<br>Ensure climate change impacts and potential increases to storage capacity and/or operational flexibility are considered for any planned major redesign/ reconstruction. |
| **WM6** | Improve the MVCA hydrometric (water level and flow monitoring) network, to enhance automated monitoring capabilities and overall efficiency. | MVCA<br>WSC<br>Shared leadership roles | Flow monitoring is needed downstream of Appleton.<br>Improve the efficiency and robustness of the system as new technologies come available.<br>Establish new monitoring stations to capture climate change.<br>Establish an ice monitoring regime. |
| **WM7** | Work with municipalities, agriculture and development communities, landowners and other partners to quantify, value and protect wetlands as hydrologic and natural assets. | MVCA<br>Municipalities<br>Universities<br>DEVEL and AGRI<br>Indigenous Peoples<br>NGOs<br>Shared leadership roles | Explore collaborations with academic community to undertake ecological/environmental valuation research.<br>Explore federal funding opportunities to support valuation research relative to climate change resiliency. |

## Water Management Strategic Actions *(Continued)*

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **WM8** | Work with municipalities, agriculture and development communities, and other landowners and partners to enhance on-site retention and infiltration of water. | Municipalities (Lead)<br>MVCA<br>DEVEL and AGRI<br>NGOs<br>Shared leadership roles | Produce and deliver education and communication programming to demonstrate LID technologies for municipalities and developers.<br>Work with municipalities to determine strategies for the implementation of LIDs at both policy and planning approval levels.<br>Direct stewardship programming to focus on on-site retention/LID design and best management practices. |
| **WM9** | Enhance response planning and readiness through the Low Water Response Team and ensure it includes representation from all key water use sectors. *(CA responsibility falls under Ontario Low Water Response Strategy)*. | LWRT (Lead)<br>Municipalities<br>MNRF | With broad representation of many partners, the LWRT is well positioned to lead projects aimed at:<br>• determining sector specific stresses and needs during drought events to inform water budget and water management considerations.<br>• encouraging the development of water conservation measures and tools among impacted sectors to support self-directed resilience efforts. |
| **WM10** | Support Hydro Producers and municipalities in undertaking an Ice Risk Assessment where deemed beneficial. | MVCA<br>HYDR0 (Lead)<br>Municipalities (Lead) | MVCA to provide a support rather than lead role.<br>Work with hydropower producers and municipalities to determine the need for such a study.<br>Assist in providing data and technical support, and in seeking project research support and/or funding from outside sources. |

Flooding on the Clyde River, Gordon Rapids 1998

# Natural Hazards

STRATEGIC GOAL
**"To minimize risks to human life and property due to flooding, erosion, and unstable slopes and soils."**

Objectives:

- Identify hazards and mitigate risks associated with flooding, erosion, unstable slopes, and unstable soils.
- Undertake water management operations to mitigate flooding and erosion.
- Provide flood storage throughout the system.
- Provide effective flood forecasting and warning.
- Communicate and educate about risks and mitigation strategies associated with flooding, erosion and unstable slope/soils.

**Overview**

Natural Hazards include flood hazards, erosion hazards, unstable soils and hazardous slopes. In Ontario, the Conservation Authorities (CAs) are the primary agency responsible for issues related to natural hazards. Where there is no CA, including the area to the north of MVCA and throughout most of Northern Ontario, it is the responsibility of the MNRF. The CAs are responsible for identifying and mapping natural hazard areas, and for reviewing local municipal Official Plans and Zoning By-laws to ensure they contain appropriate mapping, policies and provisions to direct development outside of hazardous lands and, where permitted, to include appropriate floodproofing, erosion and slope stability control measures. Note: CAs full set of responsibilities specific to flooding are listed and described further on Page 48.

The Provincial Policy Statement (PPS, 2020) is the key policy document for guiding the management of development on hazardous lands. Local municipalities are responsible for implementing provincial natural hazard policies (PPS Sect. 3.1) by restricting development in natural hazard areas. Under agreement with the province (MMAH and MNRF) the

CAs are responsible for reviewing municipal policy documents and development proposals processed under the *Planning Act* to ensure compliance with provincial Natural Hazard policies. MVCA also regulates development in flood and erosion risk areas by implementing its *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses O.Reg 153/06*. In the Mississippi River watershed, both the Mississippi-Rideau Septic System Office (MRSSO), which is an entity of the MVCA and the Rideau Valley Conservation Authority (RVCA), and the local Public Health Units review development applications with respect to sewage system requirements under the Ontario Building Code.

## Flood Hazards

Following provincial standards and guidelines, the flood hazard in the Mississippi River Watershed is defined and mapped based on the 100-Year Flood standard. The 100-Year Flood is defined as a flood event that has a return period of 100 years on average, or has a 1% chance of occurrence in any given year.

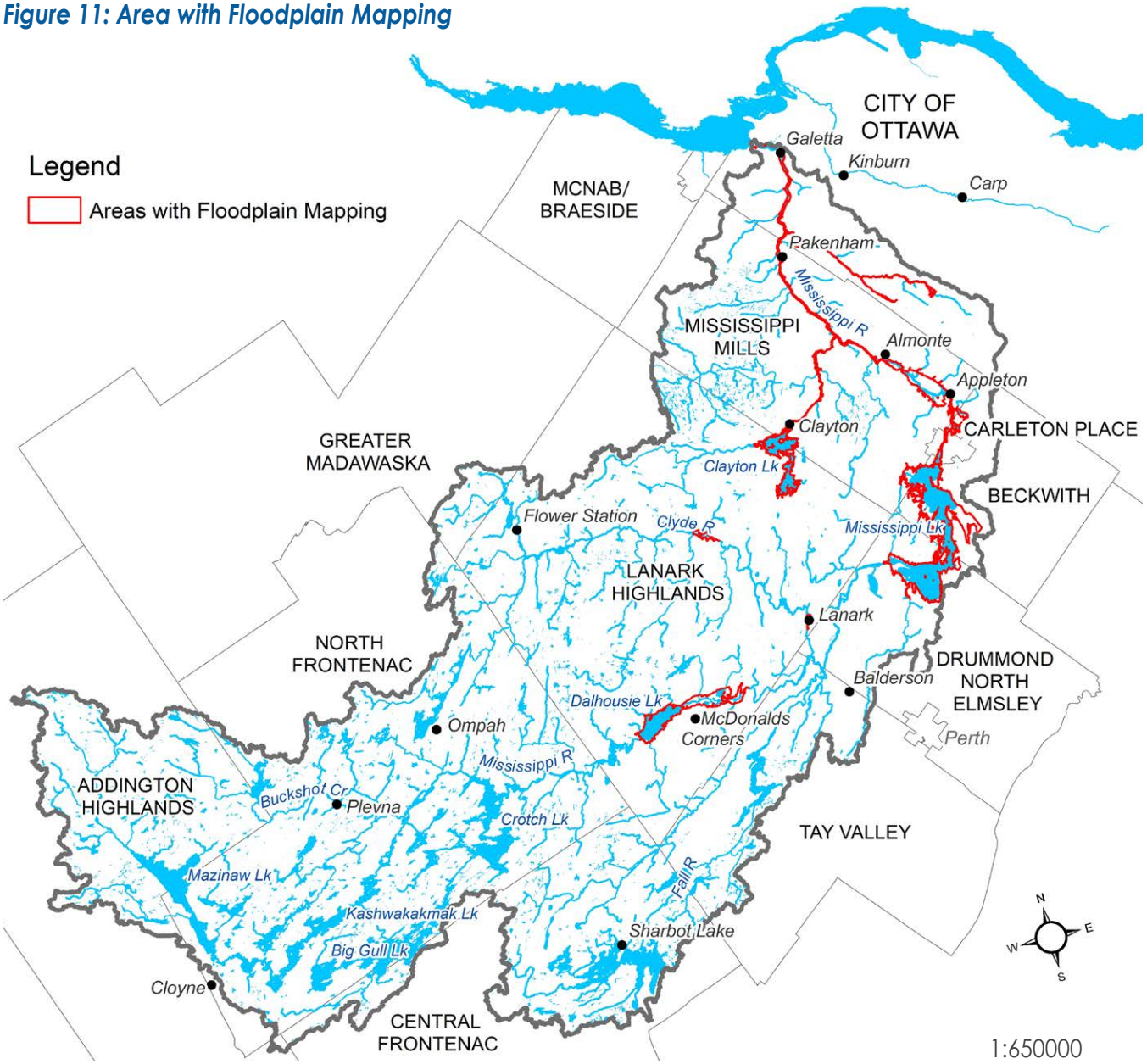
Floodplain mapping has been prepared for urban areas, rural built-up areas (i.e. Dalhousie Lake and Mississippi Lake) and the downstream sections of the Mississippi River, Indian River, and Cody Creek (see Figure 10). Floodplain areas pose a risk to residents, structures, and access roads and were mostly developed before implementation of provincial regulations. MVCA administers O.Reg 153/06 in the mapped floodplain areas to restrict further development and to require landowners to implement floodproofing measures. A "Two-Zone" policy around Mississippi Lake allows for intensification of the "flood fringe" portion of the floodplain where sufficient floodproofing can be demonstrated.

Almost 500 homes/cottages and 1,000 auxiliary structures are within the mapped floodplain areas shown on Figure 11. The areas have seen continued intensification of development, including new residences and accessory structures, and enlargements to existing development.

There are also numerous roadways, both public and private that cross through floodplain areas to provide access for property owners. The private roads, originally built for seasonal cottage access, are now servicing many properties for year-round use. These roads

were often not built to address floodproofing standards and during major flood events they can be rendered inaccessible for local traffic and emergency vehicles. PPS (2020) policy requires the provision of safe access for all new development as a flood protection standard.

***Figure 11: Area with Floodplain Mapping***



## Conservation Authority Responsibilities for Flooding:

- Monitoring flows, water levels and flood conditions (see Water Management)
- Maintaining and operating water control structures (see Water Management)
- Computer modelling and flood forecasting
- Disseminating flood messages
- Advising municipalities on flood contingency planning and response
- Providing planning support and advice to municipalities to minimize the impact of flooding on development
- Regulating development in flood prone areas (see Natural Hazards)
- Protecting natural features such as wetlands that help to control flooding (see Natural Systems)
- Educating the public about natural hazards

## Slope, Erosion and Unstable Soils Hazards

The Mississippi River watershed also has areas that are susceptible to slope and/or soils instability due to: the presence of organic soils; the presence of sensitive marine clays (Leda type clays)or other unstable or highly erosive soil types (sandy or silty soils); and/or erosion from river bank undercutting. Most known slope stability hazards are located in the east watershed between Almonte and Pakenham, and along Cody Creek. Currently, erosion and slope risk areas are only mapped and regulated in areas that have floodplain mapping. Areas with unstable slopes and/or soils, that are located outside of the floodplain hazard mapped areas are not addressed under MVCA regulations, presenting a potential deficiency in natural hazard mitigation and protection.

## Water Management for Flood Mitigation

MVCA's Water Management program and strategies as described on Pages 34 to 44 pertain both to water availability during low flow and drought conditions, and to mitigating flooding and erosion during high flow conditions and extreme flood events.

## Flood Forecasting and Warning

MVCA is the lead agency responsible for flood forecasting and warning. Forecasting uses stream flow, snow pack, and weather data, with modelling, to predict flood events. Enhanced modelling of the watershed is needed to determine if opportunities exist to create new storage capacity or to adjust operating regimes to mitigate existing risks and the projected impacts of climate change (see Action WM1).

MVCA also has in place a Flood Warning System that is activated in the event of a flood to help prevent the loss of life, and to minimize property damage. The warnings are issued to the municipalities, other interested parties and the general public.

## Flood Response

The responsibilities for flood response are shared between the municipalities and the Provincial and Federal governments. Municipalities are responsible for emergency preparedness and flood response and recovery (ex. public communications, making sandbags available, closing flooded roadways, etc.) The Federal and provincial governments are responsible for administering various disaster mitigation, adaptation and recovery assistance funding programs.

## Challenges

**Mapping/Information Limitations**
- Floodplain mapping is costly requiring up-to-date aerial imagery and engineered modelling, and has focused on built up areas/communities of known flood risk and the east watershed.
- Incomplete floodplain mapping coverage in the west watershed may result in flood risk areas that are not officially identified for planning and regulatory purposes.
- Unstable slope and soil hazards mapping is currently limited resulting in incomplete application of regulation relative to slope and erosion hazards across the watershed.

**Water Management and Water Storage for Flood Mitigation**
- See Water Management Pages 34 to 44.

**Regulatory Floodplain and Flood Proofing Standards**
- The original 100-Year Flood standard and associated flood proofing/mitigation standards were developed prior to climate change considerations and may not adequately mitigate impacts during extreme flood events.

**Land Use Intensification in Floodplain Areas**
- Two-zone policies (Mississippi Lake) enable intensification that pushes the limits of development within the floodplain. This is especially challenging on undersized and/or physically constrained properties.

**Planning and Permit Processes**
- Management of development in floodplain areas is administratively challenging for both MVCA and municipalities.
- Municipal planning application review and MVCA regulations are managed in parallel but are not fully and consistently integrated. This can cause frustration for applicants, short and long-term impacts to the environment, and potentially exacerbate the potential impacts of natural hazards.

**Roadways and Unsafe Access**
- Roadways, many privately owned, are prone to flooding during extreme events which may prevent/impede access of emergency vehicles and pose a safety risk to residents.

**Near shore and in-water works/structures (retaining walls, docks, etc.)**
- There are many shoreline structures along lakes and waterways that are vulnerable to fluctuations in water levels, major storms and ice damage.
- They can also cause environmental impacts if designed incorrectly and cause water management conflicts.

## Natural Hazard Strategic Actions

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **NH1** | Maintain up to date hazard mapping to identify and map flood and erosion risk areas, including effects of climate variability and change. | MVCA(Lead)<br>MNRF<br>Municipalities | Work with the province and municipalities to provide updated LiDAR imagery every 10 years.<br>Conduct regular floodplain mapping updates. |
| **NH2** | Work with MNRF to assess and update the current floodplain standard (100 Year), policies, and floodproofing measures. | MVCA<br>MNRF (Lead)<br>Municipalities | Encourage, and where practical, support the province in carrying out the recommendations of the Ontario's Flooding Strategy, 2020 for improved policies and standards.<br>Consult with municipalities regarding known inefficiencies in current floodproofing standards (i.e. evidence/ documentation of structures and roads impacted during flood events). |
| **NH3** | Work with municipalities to undertake a roadway flood vulnerability assessment to: identify flood prone roadways; and properties potentially impacted by unsafe access; and to develop a strategy to address properties potentially impacted by unsafe access. | MVCA (Lead)<br>Property Owners<br>Municipalities | Following assessment, work with municipalities to develop a strategy to address provincial requirements for safe access. |

## Natural Hazard Strategic Actions *(Continued)*

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **NH4** | Develop methodologies for identifying and mitigating potential risks associated with unstable slopes and unstable soils throughout the watershed. | MVCA (Lead)<br>Municipalities<br>MNRF | Undertake preliminary mapping to identify those areas where unstable slopes are likely to occur based on soils, vegetation, etc.<br>Work with municipalities in mitigating potential risks associated with unstable slopes.<br>Identify areas and existing information about marine clays and identify potential risks and triggers.<br>Establish a zone around slopes where a more rigorous geotechnical assessment should be undertaken.<br>Develop a slope stability screening tool (GIS based) for internal use by municipal planners. |
| **NH5** | Support waterfront property owners in implementing adaptive management measures to address potential impacts of variable water levels. | MVCA (Lead)<br>Waterfront Owners and Groups<br>Municipalities | Develop educational materials about adaptative measures for waterfront living (ex. removable vs fixed docks, enhanced deep rooted shoreline vegetation to resist erosion, etc.).<br>Work with water recreation-based businesses, lake associations and municipalities to implement shoreline adaptive management measures |

The water quality of the lakes and rivers impacts overall aquatic health.

# Water Quality

STRATEGIC GOAL
**"To sustain or improve current water quality for all users."**

Objectives:

- Establish surface water quality trends and determine sources of surface water quality impairment.
- Carry out remedial actions to mitigate further degradation and ensure safe drinking water.
- Establish groundwater quality trends and determine sources of groundwater quality impairment.
- Prevent groundwater contamination to ensure safe drinking water supplies.

**Overview**

Safe drinking water, from both surface and groundwater supplies, is critical to human health. The water quality of the lakes and rivers is also critical to local environments and economies, supporting tourism, outdoor recreation, and cottage and waterfront communities that in turn support local business and commerce. There are many agencies that have a role in the protection of water quality (Figure 12).

The MECP is the lead agency responsible through the implementation of the *Water Resources Act*, the *Environmental Protection Act* and the *Clean Water Act* (Source Water Protection). Under the *Clean Water Act*, municipalities are responsible for the implementation of local source protection plans (regulation of development and land use within influence areas) and the Provincial Policy Statement (PPS 2020).

Conservation Authorities (CAs) are responsible for the development and upkeep of local Source Protection Plans for the protection of drinking water. In this role they provide technical expertise and guide local policy. The MVCA Board of Directors act as the Source Protection Authority (SPA). MNRF and DFO are responsible for water quality as it relates to the protection of fish populations and fish habitat. Other agencies

***Figure 12: Agencies Involved in Water Quality***

| Protection | Compliance | Monitoring | Reporting | Stewardship |
|---|---|---|---|---|
| • MECP<br>• CAs<br>• DFO<br>• EC<br>• MNRF<br>• Municipalities<br>• OMAFRA | • DFO<br>• MECP<br>• OMAFRA | • MECP<br>• CAs<br>• Health Units<br>• NGOs | • CAs<br>• MECP<br>• NGOs | • DFO<br>• EC<br>• CAs<br>• MNRF<br>• NGOs |
| Regulating various activities that may harm water quality. | Implementing legislation that is specific to the protection of water quality. | Regularly collecting data on water quality. | Compiling, analyzing and reporting on, water quality data. | Providing activities that protect, restore and/or enhance water quality. |

including OMAFRA, MMAH and the Health Units also have a role. A full list of agencies and applicable legislations is provided in Appendix B – Table 2.

The table on Page 55 lists the water quality monitoring programs taking place within the watershed. MVCA's water quality monitoring and reporting focuses mostly on nutrient levels and trophic status, which provides a measure of the recreational (aesthetic) quality of the lakes and rivers and reflects the overall aquatic ecological condition. The MECP provincial programs monitor for a much broader suite of parameters.

Both surface and groundwater quality in the Mississippi River watershed are generally good. In the lakes, nutrient levels (total phosphorus) fall mostly within the desirable ranges for recreational water quality objectives. PWQMN data also shows that nutrient levels

and other parameters measured in the rivers and streams are generally well within the acceptable limits.

Groundwater quality monitoring is primarily limited to the provincial PGMN program which collects groundwater samples periodically. Some data is also collected through monitoring wells installed for large scale development proposals. Landowners with private wells have access to free bacteriological monitoring of their well water through their local Health Unit.

Water quality is a key concern of waterfront property owners. Harmful Algae Blooms (HABs) have been confirmed on Mississippi and Dalhousie Lakes in recent years. HABs are triggered by a combination of nutrient availability and warm temperatures.

Harmful Algae Bloom
Mississippi Lake, 2016

## Water Quality Monitoring Programs in the Watershed

| Program | Agency | Data Types | Notes |
|---|---|---|---|
| **MVCA Lake Monitoring Program** | MVCA | Trophic status indicators | 44 lakes (63 sites) on 2 to 5 yr. rotation |
| **MVCA Stream Monitoring Program** | MVCA | Benthic invertebrates and stream characterists | Stream sites throughout the watershed |
| **Provincial Water Quality Monitoring Network (PWQMN)** | MECP (Lead)<br>MVCA (Partner in field work) | River water chemistry and parameters | 11 stations<br>MVCA collects samples on behalf of MECP |
| **Provincial Groundwater Monitoring Network (PGMN)** | MECP (Lead)<br>MVCA (Partner in field work) | Groundwater levels and general chemistry | 8 wells measure continuous water levels<br>MVCA collects data in the field on behalf of MECP<br>Annual water quality testing |
| **Beach Water Quality Monitoring** | Public Health Units | Total Coliform<br>E.coli | Testing at public beaches |
| **Private Well Water Testing Program** | Public Health Units | Total Coliform<br>E.coli | Free bacteriological testing of well water to private residents |
| **Citizen Science Programs** | Various | Lake water quality | MECP Lake Partner Program<br>Water Rangers<br>Lake Associations |

## Key tools for the protection of water quality include:

**Riparian/vegetated buffers** along the shorelines of lakes and rivers to intercept and filter pollutants. This is one of the most effective tools in protecting surface water quality. The minimum recommended buffer is 15 metres in width parallel to the shoreline.

A **30 metre development setback** from the normal average high water mark.

**Protection of wetlands** which filter pollutants.

Proper installation, operation and **maintenance of septic systems** to prevent leakage into groundwater and surface water supplies.

Municipal Official Plan policies and Zoning By-law **provisions for minimum lot size and maximum lot coverage** can have a major benefit for protecting water quality by decreasing waterfront development density.

**Stewardship and education programs** to encourage best management practices by property owners (including agriculture, development and waterfront communities) of the tools/best management practices listed above.

## Why the Riparian Buffer and the 30 Metre Water Setback are so Important

A riparian buffer is a vegetated area (a "buffer strip") next to a stream, river or lake, which helps to protect the watercourse or waterbody from the impact of adjacent land uses. The recommended buffer is a 15 metre wide band of vegetated and naturalized area along the shoreline.

**Riparian buffers** play a critical role in protecting water quality by filtering and taking up nutrients and other pollutants before they reach the water. The vegetation's roots stabilize streambanks and reduce floodwater velocity, resulting in reduced downstream flood peaks. Riparian areas also supply food and cover for a large diversity of animals and serve as migration routes and stopping points between habitats for a variety of wildlife.

Provincial guidelines and supporting research also recommend a minimum **30 metre development setback** from the average normal high water mark as a key tool for the protection of water quality. The **30 metre setback** from water provides for infiltration and uptake of nutrients and other pollutants before they reach the water.

A riparian buffer extending 15 metres from shore, and the 30 metre water setback are the two most effective tools in minimizing the impacts of development in waterfront areas. These are implemented through the municipal plan review process and MVCA's Development, Interference with Wetlands and Alterations to Shorelines and Waterways Regulation. They are also implemented on a voluntary basis through various stewardship efforts.

## Challenges

**MVCAs Lake Monitoring Program and MVCA Stream Monitoring Program**

- These programs rely on significant resources and there may be overlap with the MECP Lake Partner Program and other monitoring programs.
- The lake data provides for a general overview of current conditions but is insufficient for trend analysis or in-depth qualitative analysis.

**Drinking water quality and Public Health**

- Source Protection Policies focus on municipal systems. For rural development on private services, protection of surface and groundwater protection relies on education and the implementation of best management practices.
- Source Protection identifies extensive areas of Highly Vulnerable Aquifer throughout the watershed.
- Harmful Algae Blooms (HABs) pose a potential threat to private lakeside water intakes, Carleton Place water supply, and recreational use at public beaches.

**Land use intensification**

- Concentrations of sewage systems in settlement and rural built up areas may lead to drinking water contamination issues.
- Intensification of waterfront development within the 30 m water setback and associated clearing of riparian buffer areas can cause impairment of water quality from faulty septic systems, overland runoff of fertilizers, pesticides, and road salt.

**Riparian Buffers**

- There is limited direct regulation to protect riparian vegetation so implementation is attempted through conditions of approval under the *Planning Act* and the MVCA Regulation.
- The conditions of approval are difficult to enforce and compliance monitoring/enforcement is challenging due to lack of resources.

**Stormwater and Municipal and Agricultural Drainage**

- Stormwater from large scale development (subdivisions, industrial and commercial parks, etc.) including sediments/siltation, road salt, and nutrients is a source of pollution to surface and groundwater.
- Municipal drains through rural areas present a resource management conflict between maintenance needs (dredging and clearing of riparian vegetation vs riparian benefits).
- Agricultural drains that lack riparian buffers are a source of nutrients and other pollutants.

**Stewardship Challenges**

- Stewardship programming faces chronic funding and resource challenges.
- Outside of Ottawa, stewardship program opportunities for the rural/agricultural property owners are limited.
- Uptake for stewardship initiatives is not reaching the properties and locations most in need, such as agricultural lands, higher density development areas and waterfronts.

## Challenges *(Continued)*

**Stewardship Challenges *(Continued)***

- Limited uptake of septic reinspection programming due to funding and property rights concerns.
- Lack of educational resources and outreach to targeted properties/landowners.

## Water Quality Strategic Actions

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **WQ1** | Continue to support the Ministry of Environment, Conservation and Parks (MECP)Provincial Water Quality Monitoring Network (PWQMN) in collecting baseline surface water quality data. | MECP (Lead)<br>MVCA | Recognize the extreme importance of the PWQMN in providing consistent and long-term surface water quality data. |
| **WQ2** | Improve the groundwater monitoring program to meet municipal and private source water protection needs. | MECP (Lead)<br>MVCA<br>Municipalities<br>Health Units<br>Property Owners | Undertake a groundwater data needs assessment to determine whether current monitoring meets municipal and MVCA requirements for their obligations for Source Protection.<br>Where needed, work with MECP to address identified deficiencies.<br>Work with RVCA and the municipalities to establish a centralized groundwater data warehouse to include PGMN data and groundwater data collected through the subdivision review process, the Health Units, and other identified sources.<br>Investigate opportunities for enhanced groundwater data collection through the use of existing private wells, in collaboration with property owners. |

## Water Quality Strategic Actions *(Continued)*

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **WQ3** | Continue to support municipalities in actions prescribed by the Mississippi-Rideau Source Protection Program. | MVCA-SPA (Lead)<br>Municipalities (Lead)<br>Shared leadership roles | Ensure that the Mississippi-Rideau Source Protection Plan is reviewed and updated regularly to address new information and understanding, changes in the watershed and watershed needs. (i.e. climate modelling results, water budget updates, etc.)<br>Work with the Town of Carleton Place to ensure expansion of its water and wastewater facilities can address water supply/ demand, and quality requirements relative to growth and climate change.<br>Work with MVCA Source Protection Authority (SPA) to review the implementation/effectiveness of the MRSPP best practices guidelines and education/outreach initiatives with respect to rural areas.<br>Promote the Well Aware Program, and provide information and links through MVCA's website to increase public awareness about groundwater and wells in rural areas. |
| **WQ4** | Support municipalities in assessing and enhancing stormwater management in new and existing developments. | Municipalities (Lead)<br>Development | Continue to provide municipalities with stormwater management advisory services for new development, to mitigate flood impacts and to provide water quality control to the receiving water bodies.<br>Encourage municipalities to inventory catchment areas lacking or requiring upgraded, stormwater management facilities and work with municipalities to determine best management practices and retrofit solutions for existing stormwater facilities that are deficient in meeting current quantity and quality objectives. |

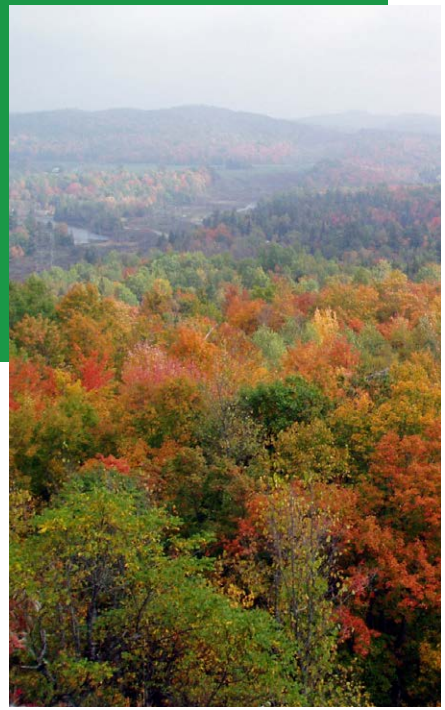
## Water Quality Strategic Actions *(Continued)*

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| | | | Recommend municipal Official Plan policy requiring coordinated stormwater planning for areas of concentrated rural settlement; and promote and participate in the development of master stormwater drainage plans, to address quantity and quality control, for the rural settlement areas where high growth is projected and/or already occurring. |
| **WQ5** | Work with municipalities and the province to improve application and coordination of regulatory tools for the protection of water quality, shoreline and riparian areas. | MVCA<br>Municipalities MECP<br>MNRF | Review municipal Official Plans and Zoning By-laws, MVCA Regulations Policies and Guidelines, and MNRF *Public Lands Act* Work Permit requirements and guidelines, to determine opportunities for improved consistency.<br>Develop a simplified property owners guide for undertaking work on the shoreline. |
| **WQ6** | Continue to offer Septic Approval and Re-Inspection Programs for municipalities and encourage all municipalities to implement septic re-inspection programs in high priority areas such as waterfront and rural settlements. | Municipalities (Lead)<br>MRSSO (Lead)<br>Shared leadership roles | Requires willingness and support, both political and financial, by the municipality.<br>Voluntary programs are easier to implement at the outset.<br>Mandatory programs have been implemented in parts of Central Frontenac and Tay Valley Township, where there has been demonstrated public support within a lake community. |

## Water Quality Strategic Actions *(Continued)*

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **WQ7** | Review existing and potential environmental monitoring programs and identify opportunities for improvement/ collaboration. | MVCA<br>MECP<br>Other Government<br>NGOS<br>Citizen Science<br>Etc. | Examine the potential need for a baseflow monitoring network to measure baseflow conditions at key locations throughout the watershed.<br>Consider realigning monitoring programs, where needed to:<br>• address climate change detection and assessment needs (i.e. to support vulnerability and impact assessments);<br>• facilitate "state of the watershed/subwatershed" trend analysis and reporting, and environmental target assessment;<br>• support nutrient and ecological modelling and other research initiatives.<br>Promote citizen science-based monitoring programs as a complimentary means of collecting environmental data and to provide community engagement and education. |
| **WQ8** | Continue annual analysis and reporting of water quality conditions. | MVCA (Lead) | Continue to use the Watershed Report Card five-year reporting cycle to monitor changes in wetland and forest cover conditions.<br>Review and adjust reporting cycles, parameters, and geographic coverage where needed.<br>Measure wetland, forest and other environmental conditions against Environment Canada and other relevant targets.<br>Continue to produce Integrating Monitoring Reports at the subwatershed scale. |

Scenic view of
Lanark Highlands



# Natural Systems and Land Conservation

STRATEGIC GOAL
**"To maintain, enhance, or restore natural features and systems for all users."**

Objectives:

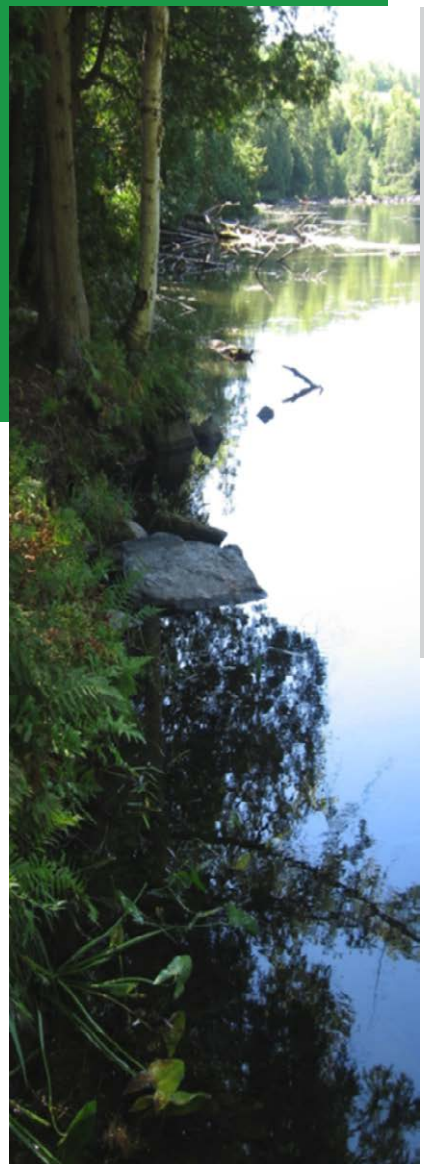
- Protect and enhance the form and function of aquatic habitat and riparian areas.
- Reduce habitat fragmentation and protect, restore and enhance natural cover to improve connectivity, quality, biodiversity and ecological function.
- Optimize use of land acquisition tools and explore new means of acquiring public natural assets.

**Overview**

The watershed has large contiguous expanses of natural area in the west and much smaller fragmented pockets in the east. The interconnectivity between lakes, rivers, riparian areas, wetlands and woodlands is essential to maintaining biological diversity, ecosystem services, and species populations. The Natural Heritage System approach moves from treating natural features as isolated units and provides a more solid foundation in maintaining, restoring and enhancing ecologically sustainable and resilient landscapes to help buffer the impacts of climate change.

In Ontario, many jurisdictions have a role in the management, conservation and protection of natural features and systems. Federally, Fisheries and Oceans Canada is responsible for the protection of aquatic systems and Environment Canada (EC) for Species at Risk and Natural Environment Areas and Migratory Bird Sanctuaries. MNRF is responsible for provincial support and oversight of the protection of natural features and systems through the policies of the *Provincial Policy Statement (PPS, 2020)*, and municipalities are responsible for their implementation through their Official Plans and Zoning By-laws. MNRF is also responsible for fish and wildlife management (populations, regulating harvest, etc.). The MECP is responsible for the Species at Risk in Ontario (SARO) list and for their protection under the *Endangered Species Act*. The Conservation Authorities (CAs), under the *Conservation Authorities Act*, are specifically responsible

A healthy vegetated shoreline



for the regulation of development in and adjacent to wetlands. The legislations and agencies for natural feature protection and land conservation are listed in Appendix B Table 3.

## Aquatic Habitat

Regulatory tools for protecting aquatic systems include: the *MNRF Public Lands Act* and *Lakes and Rivers Improvement Act*; MVCA's *Development, Interference with Wetland and Alterations to Shorelines and Watercourses Regulation*; and municipal implementation of the Provincial Policy Statement, 2020(sect. 2.1). A variety of implementation measures are available including: development setbacks from water, requirements for the maintenance and/or enhancement of a vegetated riparian buffer, sediment controls, in-water timing restrictions, and equipment restrictions for works in/near water. These tools generally only come into play when a property owner is undertaking an activity that requires a formal application process for work on the waterfront. Vegetation clearing and grading activities often take place outside of the regulatory process and can cause significant negative impact on the riparian and aquatic environments.

Education and outreach have proven helpful in furthering the protection of aquatic environments through the promotion of shoreline and waterfront best management practices. There have been numerous local stewardship initiatives to enhance riparian buffers and fish habitat. MVCA has collaborated with a number of partners in carrying out such projects, and many other groups carry out such initiatives on their own and through other partnerships.

## Wetlands

Under the PPS 2020, municipalities are required to protect Provincially Significant Wetlands (PSWs), while protection of other wetlands is at the municipality's discretion. Since 2006, Conservation Authorities have had the responsibility and regulations to regulate wetlands. This extends to the wetlands that are not evaluated as PSWs. At the watershed scale, the current wetland cover of 13% meets Environment Canada (2013) minimum targets of 10%, though if wetland losses continue the watershed could dip below the threshold levels. A local vulnerability assessment also predicts that most watershed wetlands are at risk of shrinking or drying due to climate change (Ontario Ministry of the Environment and Climate Change. 2014).

## Forests

Under Section 2.1 of the PPS (2020), municipalities are required to identify and protect significant woodlands in EcoRegions 6E and 7E (see Page 16). Here, that generally coincides with the Lowlands area that lies off the Shield and where we also see the lowest amounts of forest cover and interior forest. The EC (2013) targets include a minimum of 30% forest cover and 10% interior forest habitat. At the watershed level there is 64% forest cover overall, however there is significant disparity between the 72% forest cover in the Shield area and 31% in the Lowlands. At the watershed level there is 23% forest interior, and the Shield area has 27% forest interior, whereas the Lowlands area has just 6%. In this area there is also a lack of natural corridors and linkages between the woodlands and other natural areas.

While there is extensive crown land in the west, across the entire watershed, 70% of forested lands are in private ownership where regulatory tools for managing harvest are limited.

A painted turtle in its aquatic habitat

## Areas of Natural and Scientific Interest (ANSIs)

Under the PPS 2020, municipalities are required to protect Provincially Significant ANSIs. The protection of other ANSIs is at the municipality's discretion. The thirteen ANSIs classified as provincially significant are protected however, there is inconsistent protection for the nine Regionally Significant, Locally Significant and Candidate ANSIs across the watershed.

## Species at Risk

The protection of Species at Risk and their habitat is primarily captured only for activities that are subject to the *Planning Act* application process. Otherwise, impacts to species at risk resulting from activities on the land and in water are not adequately monitored and addressed.

## Natural Heritage Systems (NHS)

Under the PPS, municipalities are required to identify and include policies in their Official Plans for Natural Heritage Systems (NHS) in EcoRegions 6E and 7E (see Page 16). Several different NHS mapping projects have been produced for various parts of the watershed, but there is no comprehensive systems-wide mapping product to inventory the features and where they are located, and to identify connecting linkages and

corridors. There are other systems-based models, such as the A2A (Algonquin to Adirondacks Collaborative), that promote initiatives to enhance natural system connectivity at a broad regional scale.

## Land Ownership and Land Acquisition

Parts of the watershed benefit from having large tracts of natural area under public ownership and/or long-term agreements (i.e. conservation easements) for the purpose of natural area and feature protection. This provides a degree of protection from development and other land uses that may negatively impact the natural features and functions. Most of this is crown land located in the west/Shield part of the watershed, with comparatively very little public conservation land in the east/Lowlands part of the watershed.

Crown land covers almost 21% of the watershed. Another 5% of the watershed falls under public ownership and/or long-term agreements for conservation and/or recreation purposes including MVCA Conservation Areas, the County of Lanark Community Forests, the Mississippi Madawaska Land Trust properties and the Mississippi Lake National Wildlife Area, owned and managed by Environment and Climate Change Canada (Canadian Wildlife Service). The crown lands are managed under a number of classifications such as Conservation Reserve, Enhanced Management Area and General Use Area. There may be opportunity to work with the Province in identifying crown lands that are rich in ecosystem services, and that should be conserved as crown land over the long term and under the appropriate designations.

Land Trusts are another means of protecting natural areas. The Mississippi Madawaska Land Trust actively seeks to acquire large natural land holdings for long term protection. They currently have six properties within the watershed, some managed as Nature Reserves and Sanctuaries with varying levels of preservation.

A number of conservation incentives are also available to encourage the protection and restoration of natural lands that are in private ownership. The MNRF Conservation Land Tax Incentive Program (CLTIP) provides tax relief for the conservation lands such as Provincially Significant Wetlands. The Managed Forest Tax Incentive Program (MFTIP) assists property owners in sustainable harvest and management of their woodlots.

## Environmental/Ecosystem Valuation

Environmental/ecosystem valuation is a growing field of research. Environmental valuations can be used to: promote findings to foster awareness; encourage municipal governments to incorporate values into land use and policy decisions; incorporate values into subwatershed studies and other reports, plans and strategies; and establish ongoing natural capital accounting for the watershed.

Hiking trail through woods

## Challenges

**Development Impacts to Natural Systems**
- Removal of riparian buffers, remnant forests and other natural features; can lead to increased soil erosion, impairment of water quality, reduced terrestrial and aquatic habitat, and impaired ecological function.
- Regulations/policies to protect natural features are generally only applied through a formal application process.
- The tools for protection are difficult to implement, monitor and enforce.
- Many of the features are on private lands, with a reliance on education and outreach to encourage the voluntary protection of features and function by landowners.

**Wetlands**
- Current cover meets EC (2013) minimum targets, though if wetland losses continue they could dip below the threshold levels (10% for watersheds and 6% for subwatersheds).
- Vulnerability assessment predicts that most watershed wetlands are at risk of shrinking or drying due to climate change.
- Wetlands continue to be drained and filled for other land uses.
- The "ecological services" wetlands provide (easing flooding and drought and recharging groundwater) are generally poorly understood and undervalued.
- Regulatory tools and planning policies alone have proven inadequate in protecting wetlands.

**Forest and Riparian Cover**
- There is historic and continued loss in the east Lowlands part of the watershed and along waterfront.
- The Lowlands area falls below the EC (2013) minimum targets with 29% cover and 6% interior habitat and lacks natural corridors and linkages between the woodlands and other natural areas.
- 70% of forested lands are in private ownership where regulatory tools for managing the harvest/removal of forest cover are limited.

**Areas of Natural and Scientific Interest**
- There is inconsistent protection for the 9 Regionally Significant, Locally Significant and Candidate ANSIs in the watershed.

**Species at Risk**
- Protection primarily only captured through the *Planning Act* application process. Impacts to SaRs from development activities are not adequately monitored or addressed.

**Natural Heritage Systems**
- There is no comprehensive watershed-wide mapping of natural feature systems (identifying corridors and linkages as well as the natural features).

## Natural System and Land Conservation Strategic Actions

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **NS1** | Develop a Land Conservation Strategy to mitigate flood, erosion and other natural hazards, and to support the ecological services provided by natural systems. | MVCA (Lead)<br>MNRF<br>Municipalities<br>Canadian Wildlife Service<br>Agriculture,<br>Development and Forestry Communities<br>Indigenous Peoples<br>Land Trusts<br>Other Conservation Groups | Work with the province, municipalities, agricultural community, development and forestry communities, and other owners of large land holdings in maintaining and improving climate and ecosystem resilience through:<br>• programs and incentives (including tax incentives) for woodland protection and reforestation,<br>• wetland protection and creation, and<br>• low impact development, with a focus on enhancing on-site retention and infiltration of water.<br>Work with municipalities and stewardship groups to improve and increase the recognition and protection of natural heritage (woodlots, waterways and wetlands) within the watershed, with special attention to agricultural and high growth areas.<br>Assist municipalities by preparing comprehensive Natural Heritage Systems Mapping of Ecoregion 6E to address Provincial Policy Statement (PPS, 2020) requirements, on a fee for service basis.<br>Adopt a Natural Heritage Strategy for the east Lowlands area to achieve minimum targets: wetland cover of greater than 30%, forest cover of greater than 30%, and forest interior greater than 10%.<br>Work with MNRF to identify crown holdings within the watershed that are flagged for potential sale, and develop strategies to ensure the protection of crown natural assets.<br>Support the promotion of land trusts as a means of protecting natural features and systems. |

## Natural System and Land Conservation Strategic Actions *(Continued)*

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| | | | Actively pursue ownership, either by MVCA, the municipality, or other appropriate body, of suitable corridor holdings, where the opportunity arises. |
| **NS2** | Encourage and support studies that quantify the ecosystem services and climate resiliency provided by natural asset features and functions (wetlands, woodlands, etc.). | MVCA<br>Universities<br>Provincial and Federal Agencies | Environmental valuations can take many forms including:<br>• watershed modelling assessments to quantify water storage services provided by wetlands;<br>• nutrient modelling to quantify nutrient assimilation services provided by wetlands, riparian buffers and different land uses;<br>• forest cover assessments to quantify carbon sequestering services. |
| **NS3** | Work with municipalities and public agencies to improve the application and coordination of regulatory tools for the protection of wetlands, woodlands and natural systems. | MVCA<br>Municipalities<br>MNRF<br>MECP<br>OMAFRA<br>Shared leadership roles relative to legislative responsibilities | Support counties and municipalities in fulfilling Provincial Policy Statement (PPS 2020) requirements for Natural Heritage Systems. This could entail collaboration on a mapping product.<br>Encourage municipalities, through their Official Plans, to set measurable environmental targets for environmental features based on Environment Canada "How Much Habitat is Enough, 2013" guidelines.<br>Work with municipalities to determine and implement strategies, policies and measures that support stronger implementation and compliance with the 30 metre water setback and shoreline vegetated buffers, for the protection of a natural riparian area and aquatic habitat. |

Children Stream Studies at Mill of Kintail Conservation Area

# Education and Outreach

STRATEGIC GOAL
**"To support learning and environmental stewardship."**

Objectives:

- Quantify the social, economic and ecological value of watershed resources and processes.
- Communicate and educate about the values of the watershed.
- Demonstrate best management and stewardship practices and inspire and enable people to be stewards of the watershed.

**Overview**

As watershed managers, MVCA is well positioned to act as stewards of the environment and to encourage and support others in doing the same. The earlier sections of this Plan have highlighted the fact that watershed features and functions need to be understood and protected in order to improve resiliency to the stresses of changes in climate and inevitable changes in land use. In reviewing the challenges presented throughout this document, it is also clear that in protecting watershed features and functions, we must endeavor to strike a balance between voluntary stewardship and regulatory compliance. When we provide people with the right information and knowledge, they better understand the connections between their actions and the potential impacts, and they are better equipped to adopt best practices outside of a regulatory framework.

MVCA's primary responsibility in environmental stewardship is to improve knowledge and understanding about public safety associated with natural hazards and water quality. This includes improving understanding of the watershed; the interactions between climate, water and the land; and the value of natural features and systems in keeping us healthy and making us more resilient to the impacts of climate change. Understanding and awareness can only be achieved through clear communication and positive engagement. This requires support and collaboration whether through formal education and stewardship programs, or through day-to-day interactions. Teaching opportunities include positive community engagement through social media, workshops and other special events. Stewardship incentives such as grants and tax reductions (like the Conservation Land Tax Incentive Program), are also effective tools.

## Stewardship

While MVCA has had no comprehensive Stewardship Program or Strategy, stewardship initiatives have been delivered through a number of separate services that are either MVCA driven or are shared with other partners. They include:

- **MVCA's Shoreline Naturalization Program:** a small scale program that offers native plants and planting of riparian areas on private properties. Tree/plant giveaways are provided in coordination with lake associations.
- **Special Projects:** "one-off" projects that are generally funded through grants from various government and non-government sources. They range from large shoreline plantings on public properties to in-stream restorations and fish habitat projects.
- **The Rural Clean Water Program (RCWP):** a collaboration between Mississippi, Rideau and South Nation CAs, and the City of Ottawa, that delivers grants to rural property owners for a variety of stewardship activities primarily aimed at protecting water quality, with a focus on agriculture. This program is currently available only in Ottawa.
- **City Stream Watch Program:** enlists volunteers to help monitor environmental conditions in streams within the City of Ottawa. It includes an education and stewardship component implemented through special volunteer engagement events (i.e. stream clean ups, invasive species removals, etc.)
- **Green Acres Program:** a City of Ottawa program managed by RVCA, provides large scale tree planting on rural properties (greater than 1 acre). MVCA supports its implementation in the Ottawa part of the watershed.

MVCA also actively promotes other groups that carry out stewardship activities in the watershed including: Watersheds Canada, the Lanark County Stewardship Council, Lake Associations, and others.

## Communications and Education

As watershed managers we share information that is often quite complex, scientific and fact based. The messaging must be clear and understandable; it must paint the picture, make the connections, and tell the story. MVCA uses a variety of communication

tools to share information and knowledge for a range of audiences. Each of these tools provides the opportunity to raise awareness, provided the message resonates:

- **MVCA website** – the first place many look to learn about MVCA and the watershed.
- **Social Media** – regular MVCA messaging through Facebook, Instagram and Twitter.
- **Water Level Advisories** – issued regularly to disseminate information about water level conditions (both high and low water levels) using a standardized format and protocol.
- **MVCA video series** – produced and released in 2019/2020 to raise awareness about the watershed and watershed management.
- **Watershed Report Card** – released every 5 years, uses a grading system to quantify and report on several key indicators of watershed health, and Subwatershed Reports presented annually, but also on a 5-year cycle.
- **Special event**s – workshops, trade show displays, and stewardship initiatives, often in collaboration with other partners.

Shoreline planting along the Mississippi River in Carleton Place

## Challenges

**Funding**

- MVCA delivery of stewardship has suffered from a lack of dedicated staff and funding.
- A reliance on external grants makes it difficult to provide consistent programming and support from year to year.
- Without staff specifically dedicated to stewardship programming, reliance on summer students and temporary placements has made it difficult to provide the continuity needed to establish and build strong working relationships with the various communities.

**Effective Delivery**

- In delivering stewardship programs for private landowners there is chronic difficulty in engaging participation by the properties that would benefit most. Uptake is often with properties where the owner is already working to implement good practices.
- Similarly, educational initiatives (i.e. workshops and special events) often result in a "preaching to the choir" scenario and can tend to miss the target audience.
- There is limited follow-up monitoring and reporting after the stewardship project/program has been delivered to determine effectiveness.

Shabomeka Lake in the Fall

## Education and Outreach Strategic Actions

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **EO1** | Develop and implement a 3-Year MVCA Stewardship Program Pilot for hazard mitigation, climate change resiliency, and the protection of water quality, wetland cover, forest cover, and other environmental features and functions. | MVCA<br>Stewardship Groups<br>Sector Contacts<br>Indigenous Peoples<br>Agriculture,<br>Development and Forestry Communities | Formalize MVCA's role and direction in delivering a stewardship program, that includes both MVCA's own stewardship programming and promotes participation in existing stewardship initiatives delivered by other groups; and update every 5 years to redirect stewardship efforts where needed, based on water quality, wetland and forest cover target reporting.<br>Work with Stewardship Council(s) to review current stewardship programs, to determine stewardship needs, and to identify programming overlap and gaps.<br>Work with the Indigenous Communities to understand and educate the greater public about the interconnectedness of the Indigenous Communities and this land and the importance of their inclusion in protecting and preserving it.<br>Find and work with champions in the agriculture community to develop an Agricultural Outreach strategy focused on supporting farmers in implementing stewardship best practices for climate change adaptation and the protection of water quality.<br>Promote participation in land conservation incentive programs such as the RVCA Tree planting Program, Conservation Land Tax Incentive Program (CLTIP), the Managed Forest Tax Incentive Program (MFTIP) and the Alternative Land Use Services (ALUS) program. |

## Education and Outreach Strategic Actions *(Continued)*

| Action No. | Actions/Strategic Directions | Partners | Implementation Considerations and Options |
|---|---|---|---|
| **EO2** | Develop and implement an MVCA Communication Strategy in support of mandatory programs and services. | MVCA<br>All Partners | Develop and implement innovative approaches to communicating the fundamentals of Mississippi River water management for a broad audience. (A possible example: computerized graphic representations of the impact of different water level/flow and weather scenarios).<br>Develop and implement a Communications Strategy to raise awareness and understanding about watershed hazards, water quality and quantity, ecosystem services, and management and protection of watershed values and functions.<br>Consult with specific communities (agriculture, development industry, Indigenous community, lake communities, etc.) to determine tailored strategies for effective communication and messaging.<br>Investigate opportunities to establish Best Management Demonstration Projects at MVCA properties (Administration Centre and Conservation Areas) or other public properties (i.e. municipal lands). |
| **EO3** | Develop and implement an MVCA Education Strategy | MVCA<br>Schools | Develop programming for school groups in partnership with school boards and subject matter experts.<br>Host spring and summer camps, events and tours.<br>Collaborate on student work-term projects/assignments. |

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# Appendix A: Record of Engagement

**Phase 2:** In Feb/Mar 2021 the following communications tools were used to engage the community and stakeholders using the Discussion Papers described on Page 8 as the basis for discussions. The list of groups and communities reached is provided below.

- Direct Emails
- Advertisements and Articles in local newspapers
- Social Media Campaign
- Promotional Videos
  - Agriculture
  - Forestry
  - Waterfront Property
  - Tourism
- Targeted Forums (for):
  - Municipal Planners – 10 participants
  - Municipal Public Works – 7 participants
  - MVCA Staff
- Webinars (4 in total, open to public)
  - Water Management – 25 participants
  - Waterfront Property – 37 participants
  - Natural Systems – 17 participants
  - Land Development – 21 participants
- Public Survey – 62 participants

**Phase 3:** In May and June a Draft Watershed Plan was released for public review. The plan was sent to all individuals, groups and communities listed below. Advertisements were placed in local newspapers to invite people to review and provide comment on the draft plan. They were also invited to participate in an informational webinar that was held on June 2nd and again on June 10th 2021. This final version of the plan was drafted based on the additional input received.

## Existing and Potential Partners

### Government Organizations and CAs

Environment Canada – Canadian Wildlife Service

Ministry of Agriculture, Food and Rural Affairs (OMAFRA)

Ministry of Environment, Conservation and Parks (MECP)

Ministry of Municipal Affairs and Housing (MMAH)

Ministry of Natural Resources and Forestry (MNRF)

Local Health Units

Quinte Conservation

Rideau Valley Conservation Authority

South Nation Conservation

### Municipalities

County of Lanark

County of Frontenac

County of Lennox and Addington

Renfrew County

City of Ottawa

Township of Addington Highlands

Township of Beckwith

Town of Carleton Place

Township of Central Frontenac

Township of Drummond/North Elmsley

Township of Greater Madawaska

Township of Lanark Highlands

Town of Mississippi Mills

Township of North Frontenac

Tay Valley Township

## Existing and Potential Partners *(Continued)*

### Non-Government (organizations and individuals)

*Agricultural Groups*

- Arnprior Federation of Agriculture
- Dairy Farmers of Ontario
- Food Core LGL
- Gerry Rook, Christian Farmers of Ontario
- Grain Farmers of Ontario Lanark
- Lanark County 4H
- Lanark County Cattlemen's Assoc.
- Lanark County Holstein Club
- Lanark Federation of Agriculture
- National Farmers Union
- North Lanark Agricultural Society
- Ontario Landowners Association
- Ontario Sheep Farmers
- Ontario Soil and Crop Assoc. Lanark

*Conservation and Environment Groups*

- Algonquin to Adirondacks Collaborative A2A
- Climate Network Lanark
- Lanark Stewardship Council
- Mississippi Madawaska Land Trust
- Mississippi Valley Field Naturalists
- Watersheds Canada
- Ducks Unlimited Canada
- Lanark and District Fish and Game Club
- Ontario Heritage Trust

Lake Associations and Lake Networking Groups

*Forestry Groups*

- Eastern Ontario Model Forest
- Mazinaw-Lanark Sustainable License
- Canadian Institute of Forestry
- Regional Forest Health Network (under EOMF)
- Lanark Maple Syrup Producers
- Ontario Woodlot Association (OWA)

*Hydro Producers*

- Enerdu
- Mississippi River Power Corp.
- Ontario Power Generation (OPG)
- TransAlta

# Appendix B: Agencies and Legislation

***Table 1: Key Legislation Related to Water Quantity/Water Management***

| Legislation | Administering Agency | Description | Implementing Agency |
|---|---|---|---|
| Provincial Legislation | | | |
| ***Conservation Authorities Act*** | MNRF | • Authorizes Conservation Authorities to prohibit or regulate fill, construction and watercourse alteration<br>• Allows for construction and maintenance of flood and erosion control structures<br>• Authorizes Conservation Authorities to regulate, and appoint officers to enforce regulation of water use, development, and interference with watercourses or wetlands within their jurisdiction | CAs |
| ***Drainage Act*** | OMAFRA | • Facilitates construction, operation and maintenance of rural drainage works<br>• Provides legal mechanism where riparian landowners can drain their lands and divide the costs among themselves | OMAFRA, Municipalities |
| ***Lakes and Rivers Improvement Act*** | MNRF | • Empowers MNRF to regulate the construction and operation of water works<br>• Requires that new water works be approved | MNRF |
| ***Public Lands Act*** | MNRF | • Authorizes MNRF to construct and operate dams and acquire land for their purposes<br>• Authorizes power generation projects on crown land | MNRF |
| ***Municipal Act*** | MMAH | • Allows municipalities to enact bylaws for the construction, repair and maintenance of drains<br>• Prohibits the injury or fouling of drains in rivers<br>• Empowers municipalities to pass bylaws governing the construction and maintenance of dams and the straightening of water courses for flood protection | Municipalities, MMAH |

***Table 1: Key Legislation Related to Water Quantity/Water Management (Continued)***

| Legislation | Administering Agency | Description | Implementing Agency |
|---|---|---|---|
| Provincial Legislation | | | |
| ***Public Utilities Act*** | MMAH | • Empowers municipalities to acquire and operate water works and divert a lake or river for their purposes | Municipalities, MMAH |
| ***Ontario Water Resources Act*** | MECP | • Requires the issuance of a permit for the taking of more than a total of 50,000 litres of water in a day from a ground or surface source of supply<br>• Allows the MECP Director to refuse to issue, cancel, impose terms and conditions in issuing a permit or alter the terms and conditions of a permit after it is issued<br>• Requires the issuance of a permit for the construction of a well<br>• Allows municipalities to establish or replace water works with ministerial approval | MECP |
| ***Tile Drainage Act*** | OMAFRA | • Provides for low interest loans to farmers from municipalities for tile draining their properties | Municipalities, MMAH |

***Table 1: Key Legislation Related to Water Quantity/Water Management (Continued)***

| Legislation | Administering Agency | Description | Implementing Agency |
|---|---|---|---|
| Federal Legislation | | | |
| ***Fisheries Act*** | DFO | • Protects fish habitat by prohibiting habitat disturbance<br>• Ensures construction of a fishway around any obstruction in a waterway | DFO, MNRF |
| ***Navigable Waters Protection Act*** | DFO | • Prohibits dumping wastes that may interfere with navigation<br>• Prohibits construction in navigable waters | DFO |
| ***Canada Water Act*** | EC | • Authorizes agreements with provinces for the delineation of flood plains and hazardous shorelines for flood and erosion control | EC |
| ***International River Improvement Act*** | External Affairs EC | • Prohibits damming or changing the flow of a river flowing out of Canada | EC |

Crotch Lake Dam

***Table 2: Key Legislation Related to Water Quality***

| Legislation | Administering Agency | Description | Implementing Agency |
|---|---|---|---|
| Provincial Legislation | | | |
| ***Conservation Authorities Act*** | MNRF<br>MECP | • Establishes Conservation Authorities with the mandate to operate dams for the water quality enhancement, undertake water quality surveys, and comment on planning documents, and to regulate, and appoint officers to enforce regulation of water use, development, and interference with water courses or wetlands within their jurisdiction | CAs |
| ***Ontario Water Resources Act*** | MECP | • Allows for the regulation of water supply<br>• Allows surveillance and monitoring of all surface and ground water in Ontario<br>• Regulates sewage disposal and controls water pollution<br>• Allows MECP to construct and operate wastewater facilities or require it be done by an industry or municipality | MECP |
| ***Environmental Protection Act*** | MECP | • Forbids discharge of any contaminant to the environment in amounts exceeding regulations<br>• Prohibits discharge of any substance likely to impair the environment<br>• Requires spills of pollutants be reported and cleaned up promptly and establishes a liability on the party at fault | MECP |
| ***Environmental Assessment Act*** | MECP | • Requires environmental assessment of any major public or designated private undertaking | MECP |

***Table 2: Key Legislation Related to Water Quality (Continued)***

| Legislation | Administering Agency | Description | Implementing Agency |
|---|---|---|---|
| Provincial Legislation | | | |
| ***Clean Water Act, 2006 (and Source Protection Plans)*** | MECP | • Result of the Walkerton Inquiry to address drinking water safety<br>• Ensures communities protect their drinking water supplies through prevention – by developing collaborative, watershed-based source protection plans<br>• Established source protection areas, source protection regions<br>• Created a source protection committee for each area, required to identify significant existing and future risks to their municipal drinking water sources and develop plans to address the risks.<br>• Identifies municipalities as the implementers and enforcers of the plans. | CAs (technical support)<br>Municipalities (Source Protection Plan Implementation) |
| ***Lakes and Rivers Improvement Act*** | MNRF | • Ensures proposed water works do not adversely affect water quality or cause undue erosion and silting | MNRF |
| ***Planning Act*** | MMAH | • Guides municipal planning activities (e.g. requires local governments to assess the impact of a proposed subdivision on existing water supplies) | Municipalities, MMAH |
| ***Municipal Act*** | MMAH | • Grants municipalities the power to pass by-laws that prohibit the injuring or fouling of drains and sewer connections | Municipalities, MMAH |
| ***Pesticides Act*** | MECP | • Controls use of chemicals for the destruction of plant and animal pests and investigates possible harmful effects of pesticides on the environment | MECP |

***Table 2: Key Legislation Related to Water Quality (Continued)***

| Legislation | Administering Agency | Description | Implementing Agency |
|---|---|---|---|
| Federal Legislation | | | |
| ***Fisheries Act*** | DFO | • Protects fish habitat by prohibiting habitat disturbance and disposition of deleterious substances in water frequented by fish | DFO, MNRF |
| ***Canada Water Act*** | EC | • Authorizes agreements with provinces for designation of water quality management areas and other projects | EC |
| ***Canadian Environmental Protection Act*** | EC | • Controls manufacture, transportation, use, disposal of chemicals and wastes not adequately regulated by other legislation | EC |
| ***Pest Control Products Act*** | Agriculture Canada | • Regulates products used to control pests via registration according to prescribed standards | Agriculture Canada |

Mill of Kintail Conservation Area Indian River

***Table 3: Key Legislation Related to Land Use Management and Conservation***

| Legislation | Administering Agency | Description | Implementing Agency |
|---|---|---|---|
| Provincial Legislation | | | |
| ***Endangered Species Act*** | MECP | • Enables the establishment of the Committee on the Status of Species at Risk in Ontario (COSSARO)<br>• Provides COSSARO with the authority to identify and classify Species at Risk<br>• Allows the Minister to make regulations for the protection and recovery of Species at Risk | MECP |
| ***Fish and Wildlife Conservation Act*** | MNRF | • Provides for restrictions, licensing and safety requirements for hunting, trapping, fishing and other related activities<br>• Provides for regulation of handling, sale and transport of live wildlife and fish | MNRF |
| ***Planning Act*** | MMAH | • Provides for and governs land use planning<br>• Deals with provincial administration in land use planning and local planning<br>• Requires that decisions affecting planning matters be consistent with statements of provincial interest issued under the Act to be regarded in the planning process | Municipalities, MMAH |
| ***Public Lands Act*** | MNRF | • Authorizes MNRF to manage and control activities on crown land | MNRF |
| ***Mining Act*** | MNDMF | • Registers mining lands and lands forfeited to the crown<br>• Exempts lands and mining rights from taxes | MNDMF, MNRF |

***Table 3: Key Legislation Related to Land Use Management and Conservation (Continued)***

| Legislation | Administering Agency | Description | Implementing Agency |
|---|---|---|---|
| Provincial Legislation | | | |
| ***Beds of Navigable Waters Act*** | MNRF | • Declares the beds of navigable waters as the crown's responsibility | MNRF |
| ***Public Transportation and Highway Improvement Act*** | MTO | • Requires a permit for any work carried out within the right-of-way of a provincial highway | MTO |
| ***Conservation Authorities Act*** | MNRF | • Empowers Conservation Authorities to manage, regulate or acquire floodplains, hazardous shorelines and conservation lands | |
| ***Environmental Assessment Act*** | MECP | • Requires environmental assessment of any major public or designated private undertaking | MECP |

Woodlands in Mazinaw-Lanark Forest Management Area

### *Table 3: Key Legislation Related to Land Use Management and Conservation (Continued)*

| Legislation | Administering Agency | Description | Implementing Agency |
|---|---|---|---|
| Federal Legislation | | | |
| ***Fisheries Act*** | DFO | • Controls the erosion and sedimentation for the purpose of fish habitat preservation | DFO, MNRF |
| ***Species at Risk Act*** | EC | • Sets species assessment process to ensure the protection and recovery of species<br>• Measures providing for sanctions for offences under SARA<br>• Supports the public's habitat protection and species at risk recovery initiatives<br>• Provides for the issuing of permits or the conclusion of agreements for certain scientific or educational activities and for the implementation of special emergency measures | EC<br>DFO<br>Parks Canada |

### *Emergency Related Legislation*

| Legislation | Administering Agency | Description | Implementing Agency |
|---|---|---|---|
| ***Emergency Management and Civil Protection Act*** | EMO | • May take action and make such orders as he or she considers necessary to implement the emergency plans to protect property and health, safety and welfare of inhabitants of the emergency area | MNRF, Municipalities |

## Notes:


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