Policy & Priorities Committee

Virtual Meeting | 1:00 pm | April 30, 2021

AGENDA

ROLL CALL

Adoption of Agenda

Declaration of Interest (written)

1. Approval of Minutes – March 26, 2021
2. Update of MVCA Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Policies, Staff Report 3130/21 (Matt Craig)
3. Draft Mississippi River Watershed Plan, Staff Report 3131/21 (Alyson Symon)

Other Business

ADJOURNMENT

POLICY AND PRIORITIES ADVISORY COMMITTEE

Via Zoom **MINUTES** March 26, 2021

MEMBERS PRESENT:
J. Atkinson, Chair
F. Campbell, Vice-Chair
R. Darling
G. Gower
J. Inglis
J. Karau
C. Kelsey
J. Mason
K. Thompson

MEMBERS ABSENT: B. Holmes
STAFF PRESENT: S. McIntyre, General Manager
A. Millar, Treasurer
E. Levi, Recording Secretary

OTHERS PRESENT:

J. Atkinson called the meeting to order at 1:04 p.m.

PPAC26/03/21-1
MOVED BY: J. Inglis
SECONDED BY: G. Gower
Resolved, That the Agenda for the Policy and Priorities Advisory Committee meeting be adopted as presented.

"CARRIED"

BUSINESS:

1. Minutes – Policy & Priorities Advisory Committee Meeting – November 13, 2020

PPAC26/03/21-2
MOVED BY: F. Campbell
SECONDED BY: R. Darling
Resolved, That the minutes of the Mississippi Valley Policy & Priorities Advisory Committee meeting held on November 13, 2020 be received and approved as printed.

"CARRIED"

2. Election of Officers

PPAC26/03/21-3

MOVED BY: J. Karau
SECONDED BY: K. Thompson
Resolved, That Sally McIntyre be appointed as Chair for the Election of Chair for 2021.
"CARRIED"

J. Mason nominated J. Atkinson for position of Chair.

PPAC26/03/21-4
MOVED BY: J. Mason
SECONDED BY: G. Gower
Resolved, That nominations for the position of Chair be closed.
"CARRIED"

J. Atkinson agreed to stand for Chair and was duly elected by acclamation.

J. Atkinson opened nominations for position of Vice-Chair. K. Thompson nominated F. Campbell.

PPAC26/03/21-5

MOVED BY: R. Darling
SECONDED BY: J. Karau
Resolved, That nominations for the position of Vice-Chair be closed.
"CARRIED"

F. Campbell agreed to stand for Vice-Chair and was duly elected by acclamation.

3. Electronic Meetings

S. McIntyre reviewed Staff Report 3118/21 regarding potential long-term use of telephone and video-conference technology for Board and Committee meetings. Upgrades would be needed to the boardroom system to ensure reliable audio/video quality during a meeting to accommodate a mix of members on site and participating remotely.

J. Inglis commented he would be in favour of allowing remote participation when emergency is over, but was opposed to creating rules about the number of in-person meetings required and also opposed to spending a large sum of money on new equipment.

G. Gower commented that in camera meeting have been held over Zoom at the City council meetings with no issue. He noted the issue of confidentiality was no different than members bringing cell phones to the meeting. There is trust that members are not recording on their phones or other devices. He also mentioned he was in favour of maintaining virtual participation as there are often time constraints with attended meetings in-person.

J. Mason noted the price point for equipment upgrades seems substantial and wasn't budgeted for however she would be in favour of upgrades contingent on affordability.

S. McIntyre clarified that it was the audio in the board room which needed to be upgraded to accommodate use with electronic participation J. Karau suggested researching grants which may be available for that type of upgrade.

J. Atkinson suggested contacting the Clerk in Carleton Place as the town was in middle of a proposal to upgrade their audio system prior to the pandemic.

PPAC26/03/21-6

MOVED BY: G. Gower
SECONDED BY: F. Campbell
Resolved, That the Policy & Priorities Committee direct staff to:

1. **Obtain quotes for the recommended equipment upgrades to the Boardroom;**
2. **Poll Board members regarding the proposed criteria/parameters for remote participation;**
3. **Table a draft amendment to the Administrative By-laws and a final quote for boardroom equipment changes for consideration by the Board.**

"CARRIED"

4. Consent Agenda

S. McIntyre summarized Staff Report 3119/21 regarding possible use of consent agendas to streamline Board meetings and provide members with greater time to understand and discuss more important items.

G. Gower commented that the idea is worthwhile as many items have been discussed at the committee level prior to reaching the Board. S. McIntyre confirmed that agenda items are reviewed with the Chair and Vice-chair prior to meeting.

R. Darling agreed that consent agenda items should be at the discretion of the General Manager and that the inclusion of the Chair and Vice-chair is also of benefit.

J. Karau commented that RVCA used to use one however discontinued due to procedural confusion. He commented that documents should be available in a timely fashion. He would prefer longer meeting times to accommodate discussion and less lengthy presentations.

J. Mason noted that Conservation Ontario uses them and quite well. She commented that consent agenda items can be requested for inclusion in discussion at the time of the meeting. She disagreed with the notion of watershed tours being offered biennially based on the information obtained during those tours and interaction with staff.

Members discussed longer meeting times, distribution of meeting documentation well in advance of meeting including a potential members-only internet-based solution, and

reducing staff presentation time.

J. Karau offered a cautionary note about the importance of keeping staff engagement with the Board and the potential conflict with using consent agenda items in that regard.

Staff were directed to look into an online-based solution for document distribution to members and that documents be available to members at least a week in advance of meetings. Staff were also directed to provide agenda packages a full week ahead of meetings.

PPAC26/03/21-7

MOVED BY: G. Gower
SECONDED BY: F. Campbell
Resolved, That the Policy & Priorities Committee recommend that the Board direct staff to:

1. **Draft amendments to the MVCA Administrative By-law to allow for consent agenda.**
2. **Include item summaries or PowerPoints in Board Agenda Packages for verbal updates.**

"CARRIED"

3. **Hold the watershed tour biannually, and on alternate years meet as the Board.**

"DEFEATED"

5. Committee Structures & Governance

S. McIntyre reviewed staff report 3120/21 regarding establishment of an *ad hoc* Governance Committee that could report to the Board with recommendations on future committee structures and mandate.

J. Inglis commented that the Policy and Priorities Advisory Committee mandate allows for the functions being proposed for the Governance Committee.

K. Thompson noted a Governance Committee may be useful to streamline the way meetings are held.

G. Gower suggested amending the Terms of Reference for the Policy and Priorities Advisory Committee to include issues relating to governance instead of setting up a new committee.

J. Karau agreed that the Policy and Priorities Advisory Committee is well positioned to what is being sought. He commented whether this should be held until more regulatory clarity is available from the province to avoid the need to revisit. S. McIntyre advised that if the province provided the first round of regulations soon, that the committee could be operational by May of this year.

PPAC26/03/21-8

MOVED BY: G. Gower

SECONDED BY: R. Darling

Resolved, That the Policy & Priorities Advisory Committee recommend to the Board of Directors that Terms of Reference for the Policy & Priorities Advisory Committee be amended to clarify its ability to consider and make recommendations concerning committee structures.

"CARRIED"

ADJOURNMENT

The meeting was adjourned at 2:11 p.m.

PPAC26/03/21-9
MOVED BY: F. Campbell
SECONDED BY: G. Gower
Resolved, That the meeting be adjourned.

"CARRIED"

"E. Levi, Recording Secretary J. Atkinson, Chair"

REPORT	3130/21
TO:	Policy & Priorities Advisory Committee, MVCA
FROM:	Matt Craig, Manager of Planning and Regulations
RE:	**Update of MVCA *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Policies***
DATE:	April 23, 2021

Recommendations:

That the Policies and Priorities Committee recommend that the Board of Directors:

1. Direct staff to conduct public consultation regarding the new section concerning provision of vehicle access through provincially significant wetlands (PSWs), and to report back to the Board with final recommendations; and
2. Approve all other changes to the MVCA *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Policies* as presented.

1.0 BACKGROUND

MVCA's *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Policies* provide staff and landowners with direction on how Section 28 of *Ontario Regulation 153/06* is to be implemented. Clear documentation is needed to support transparency and consistency in policy application across a wide variety of situations. Periodic update of the document is used to improve clarity and to address gaps or emerging issues.

Most changes proposed in this report are housekeeping in nature and address:

- unclear or gaps in definitions.
- issues identified during review of applications emanating from the 2017 and 2019 floods.
- issues identified since adopting the wetland policies in 2017.

The only new policy introduced through this report pertains to vehicle access through a PSW. MVCA has no policy governing this matter, which became an issue during a recent permit application. All other changes clarify or document current practice. No other matters of

substance are recommended for change at this time due to anticipated changes to regulations arising from Bills 108 and 229.

2.0 ACCESS THROUGH A PSW

Currently, no practice or policy exists that permit vehicle access through a PSW to access adjacent land on an existing lot of record. This has the potential to sterilize land where the entire frontage is a PSW. Staff have been able to provide direction and advice for these types of applications where the wetland is not designated provincially significant, but lack the policy direction to work with landowners where the land is a PSW.

The new policy identifies the circumstances underwhich an access route may be permitted. While there is concern that providing access through a PSW could lead to future development pressures on the wetland, that potential would need to be addressed during subsequent planning and permit approval processes. Nothing in the proposed policy mandates that staff shall permit access through a PSW; it only provides them with the framework needed to determine whether access can be reasonably permitted.

Because this represents a new policy direction, it is recommended that staff consult with the public before the Board approves the policy.

3.0 ADMINISTRATIVE/HOUSEKEEPING CHANGES

The following sections were amended:

Section 4 - General Policies Regarding Implementation and Interpetation
(iii) Further enchrachment towards towards a hazard not supported
(iv) Filling activity
(vi)Permits and Enforcement
Section 6.1.3 - Development with 15 metre Adjacenet Allowance (new Section)
Section 6.2.1 - Fill and Grading in Floodway
(vii) one time load of fill permitted
Section 6.2.5 - Major Additions to Existing Buildings – Section deleted
*Section 6.2.[1]5 - Replacement of Buildings Destroyed by Fire or Natural Causes - w*ording to evaluate rebuilding on case by case basis
Section 6.2.7 – Foundation Reconstruction - clarification on replacement of foundation
Section 6.2.12 - Portable (Mobile) Buidlings – seasonal buildings permitted in flood hazard
Section 6.3.4 - Major Additions to Residential Buidlings – no increase in dwelling units

[1] Numbering changing through these changes.

Section 9 – changed introduction wording
Section 9.3.8 – 9.3.9 - Access and Boardwalk construction in PSW's
Section 9. 5.1. 11) & 9.5.3 - Boardwalks and Access in other wetlands
Section 9.6 – Compensation and Offsetting – added MZO wording
Appendix A – Added definitions for Detached, Shoreline ecological functions, unsafe building
Appendix B – deleted flood plain mapping section
Appendix B - Clarrification to Access, Fill Aprons and Drainage Swales sections
Appendix E – added h) erosion protection and i) rapid drawdown
Appendix I – new section on Meander Belt Assessments

Adoption of these revisons will:

- provide landowners and staff with clear, concise direction on procedures and policy;
- provide for consitency in reviews and approvals;
- allow for faster processing times; and
- reflect revisions to adminstrative procedures identified in the last flood events.

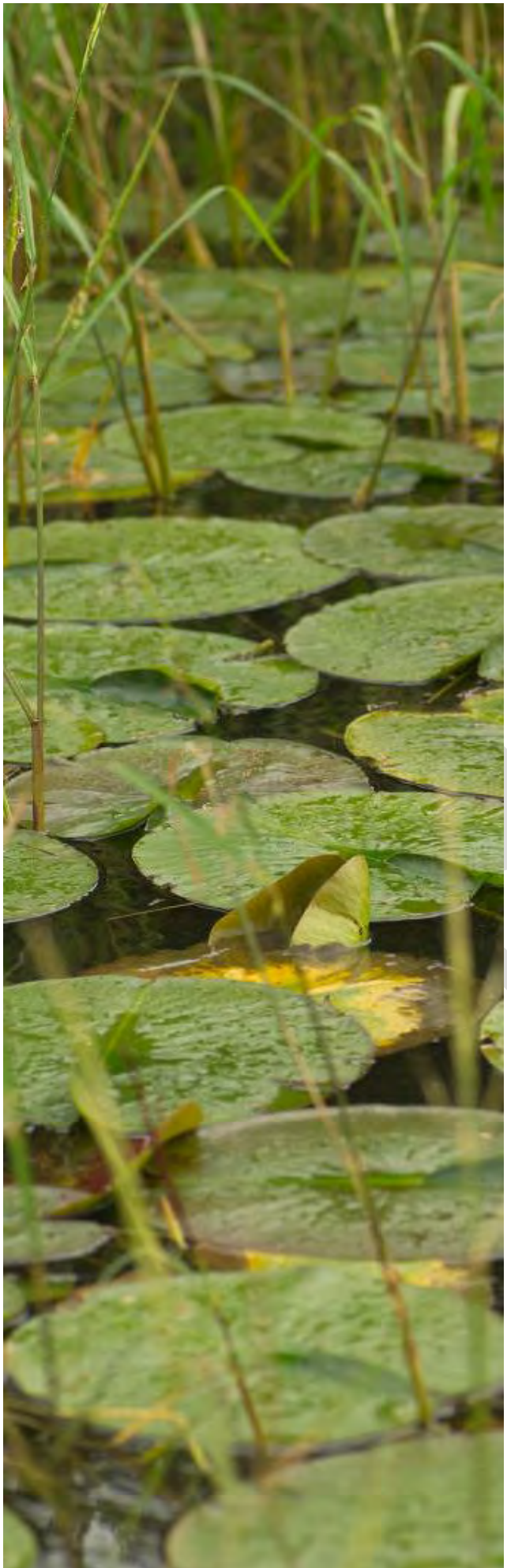
4.0 NEXT STEPS

Proposed external consulation for the revisions include:

- Notify the public and member municipalities of the proposed PSW access policies and post for comment on the MVCA website.
- Return to the Board with a final recommendation.
- Notify member municipalities of the administrative updates to the policy document and upload to the MVCA website.

ATTACHMENTS:

Regulations Policies (Proposed Changes)



Development, Interference with Wetlands and Alteration to Shorelines and Watercourses

Regulation Policies

Adopted by MVCA Board of Directors
Updated September 2019

Mississippi Valley Conservation Authority

Notes to Readers

This document was prepared under direction of the Board of Directors of Mississippi Valley Conservation Authority (MVCA) to provide clarification and consistency in the implementation of Ontario Regulation 153/06, MVCA's *Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation,* adopted pursuant to S. 28 of the *Conservation Authorities Act* of Ontario. It received approval from the Board of Directors on September 2019.

A definition is provided in Appendix A.

Table of Contents

1.0 Background

In Ontario, water and related land management are the responsibility of Conservation Authorities working in partnership with municipalities. A principal mandate of Conservation Authorities is to prevent the loss of life and property due to flooding and erosion, and to conserve and enhance natural resources. The Development, Interference with Wetlands & Alterations to Shorelines & Watercourses Regulation is a key tool in fulfilling this mandate because it allows the Conservation Authority to regulate development in areas where the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected.

Mississippi Valley Conservation Authority (MVCA)'s authority to implement the Development Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation is provided under Section 28 of the *Conservation Authorities Act*. There are a number of other provincial acts and related regulations and policy statements which deal with planning, development and activities associated with water resources. They include among others: the *Planning Act, the Building Code Act, the Public Lands Act, the Lakes and Rivers Improvement Act, the Ontario Water Resources Act*, and the *Drainage Act*. Policies and regulations made by the Conservation Authority do not take precedence over the regulations or policy statements made under these acts or any other regulations. As such, recommendations or approvals granted by the Mississippi Valley Conservation Authority, under the following policies, do not preclude compliance with any other applicable regulations or agency requirements.

1.1 Conservation Authorities Act

The *Conservation Authorities Act* was originally created in 1946 in response to emergency situations and land conservation problems resulting from flooding and erosion. The Act recognizes that these and other natural resource initiatives are most effectively managed on a watershed basis. The Act provides Conservation Authorities with the legislative responsibility to regulate certain development activities in and adjacent to watercourses (including valley lands), wetlands, shorelines of inland lakes and hazardous lands (unstable soils and bedrock). The development activities that are subject to the regulation are described in Section 3.3. In general, permits (permissions) may be granted where, in the opinion of the Conservation Authority, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land is not affected.

Mississippi Valley Conservation Authority adopted its first "Fill, Construction and Alteration to Waterways" Regulation in 1988. In the late 1990's, as part of the *Red Tape Reductions Act* initiative, the provincial government undertook a review of the *Conservation Authorities Act* and its associated Section 28 regulations. While the *Red Tape Reductions Act* was primarily aimed at streamlining and bringing clarity and consistency to existing provincial government acts and regulations, another key objective was to maintain and improve upon legislation that protects public health, safety and the environment.

Revisions to the *Conservation Authorities Act* were approved by the Ontario Legislature in December 1998. The revisions to the act brought about changes in both what and where

Conservation Authorities can regulate, by providing more concise and broadened definitions for identifying flood and erosion susceptible areas and by expanding the regulated areas to include wetlands. A new process for approving and amending Conservation Authority Section 28 Regulations was also introduced. While traditionally, Section 28 regulations described regulated activities in terms of "fill, construction and alteration to waterways", the regulated activities are now phrased in terms of "development, interference with wetlands and alterations to shorelines and watercourses". The Fill, Construction and Alteration to Waterways Regulation, was amended and renamed the Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation, Ontario Regulation 97/04.

1.2 Planning Act and Provincial Policy Statement (PPS)

The Provincial Policy Statement (PPS) 2020 provides policy direction on matters of provincial interest related to land use planning and development. The Provincial Policy Statement (PPS) is referenced when a *Planning Act* application such as a severance, a plan of subdivision or a zoning by-law or official plan amendment is considered. It provides guidance on planning matters related to Natural Hazards and Natural Heritage as well as other matters of provincial interest. The PPS states that development shall generally be directed to areas outside hazardous lands adjacent to river, stream and small inland lake systems which are impacted by flooding hazards and/or erosion hazards. It also directs that development shall not be permitted within provincially significant wetlands, and that development may only be permitted on lands adjacent to the wetland where it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Section 3 of the *Planning Act* requires that a decision of the council of a municipality, a local board, a planning board, a minister of the Crown and a ministry, board, commission or agency of the government, including the Land Planning Appeal Tribunal (LPAT), in respect of the exercise of any authority that affects a planning matter “shall be consistent” with the policy statement. It also requires that comments, submissions or advice that affect a planning matter that are provided by the council of a municipality, a local board, a planning board, a minister or ministry, board, commission or agency of the government "shall be consistent with" the policy statement.

1.3 Relation of Regulation to Planning Act and PPS

The following regulation policies have been developed to reflect the intent of the PPS and other related provincial and municipal guidelines and policies. It is the Authority's intent to administer this regulatory program in a manner that is consistent with the Provincial Policy Statement of 2020 and compatible with municipal requirements related to the undertaking of development adjacent to the shorelines of lakes, rivers and streams.

Staff responsible for the Section 28 applications must note that the principle of development will be established through prior approval of related planning applications where necessary, in advance of Section 28 approval from MVCA. The principal of development is established through the *Planning Ac*t approval process, whereas the Conservation Authority permitting process provides for technical implementation of matters pursuant to Section 28 of the *Conservation*

Authorities Act (CA Act). Concerns regarding the principle of development should be conveyed to the municipality/planning approval authority during the *Planning Act* approvals process and are not normally addressed through the *CA Act* . Conversely, municipalities in their planning approval role should recognize that the principle of development should be addressed first through the Planning Act process. Landowners who are interested in undertaking development activities that may be subject to the *CA Act* regulations should first review and address the requirements for any approvals under the Planning Act.

It should be noted that approval of any work under the Regulation does not exempt the landowner/applicant from obtaining other necessary permits from other approval bodies or individuals, public or private.

2.0 Program Objectives

In implementing the policies of this document, the Authority will provide an objective, impartial and consistent review of all applications submitted under the regulation. The objectives of the "Development, Interference with Wetlands and Alterations to Shorelines and Watercourses" Regulation program are to:

a) Prevent loss of life as a result of flood or erosion hazards.

b) Minimize property damage and social disruption resulting from flooding or erosion.

c) Minimize public and private expenditure for emergency operations, evacuation, disaster relief and restoration.

d) Prevent hazardous development within flood plains, flood and erosion susceptible shorelines and unstable slopes which in future years may require expensive protection measures.

e) Ensure that development does not increase risks to upstream and downstream landowners.

f) Prevent the filling and/or draining of natural storage areas, and development that may limit flood plain storage capacity, increase flood elevations and/or decrease slope stability.

g) Prevent pollution or other degradation of rivers and other water bodies, and existing and potential aquifer and aquifer recharge areas where the location of such resources is known.

h) To apply this regulation in a manner that complements the Ontario government's "Provincial Policy Statement" made under the authority of section 3 of the *Planning Act* (as approved by the Lieutenant Governor in Council) as well as their attendant Implementation and Technical Guidelines.

3.0 Section 28 Regulations

3.1 Powers Under Section 28 Regulation

Conservation Authorities powers under the regulation include the ability to:

a) Prohibit, regulate or provide permission for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering with a wetland.

b) Prohibit, regulate or provide permission for development if the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by the development. (*Conservation Authorities Act*, *R.S.O. 1990 Chapter 27, S. 28*)

3.2 Areas Subject to the Regulation

The regulation applies to the following:

(i) **Hazardous Lands:**
As defined under the *Conservation Authorities Act*, hazardous land means lands that could be unsafe for development because of naturally occurring processes associated with flooding, erosion, dynamic beaches or unstable soil or bedrock.

In accordance with the "Mississippi Valley Conservation - *Development, Interference with Wetlands and Alteration to Shorelines and Watercourses Regulation (Generic Regulation) Implementation Policy (Approved by the Board of Directors on November 10th, 2005),* under this regulation, MVCA will regulate development in hazardous lands where there is engineered flood plain mapping. The extent of regulated area associated with hazardous lands is identified by a Regulation Limit. The Regulation Limit has been mapped for all watercourses in MVCA's watershed for which engineered flood plain mapping is available.

(ii) **Wetlands:**
MVCA regulates development in and adjacent to all wetlands as outlined in Section 9.

As defined under Section 28 of the *Conservation Authorities Act*, a "wetland means land that:

a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface;

b) directly contributes to the hydrological function of a watershed through connection with a surface watercourse;

c) has hydric soils, the formation of which has been caused by the presence of abundant water; and

d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water, but does not include periodically soaked or wet land that is used for agricultural purposes and no longer exhibits a wetland characteristic referred to in clause (c) or (d). ("terre marécageuse") 1998, c. 18, Sched. I, s. 12."

The regulation applies to development activities, as defined in Section 3.3 that may result in interference with the hydrologic functions of a wetland.

(iii) **Shorelines and Watercourses:**

This component of the regulation applies to all watercourses or parts of watercourses including lake shorelines within the Mississippi Valley Conservation Authority watershed. These areas are not required to be defined through mapping or schedules.

3.3 Activities Subject to the Regulation

Mississippi Valley Conservation Authority regulates the following activities:

(i) **Development**

Development activities are regulated in all hazardous lands, wetlands and lands adjacent to wetlands as delineated by the Regulation Limit and are shown on map schedules prepared by the Authority. The Regulation applies to the following development activities as defined under the *Conservation Authorities Act*:

a) the construction, reconstruction, erection or placing of a building or structure of any kind;

b) any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure;

c) site grading; or

d) the temporary or permanent placing, dumping or removal of any material, origination on the site or elsewhere. *(Conservation Authorities Act, R.S.O. 1990 Chapter 27, S. 28)*

(ii) **Alterations to Shorelines and Watercourses**

Activities that are regulated include straightening, changing, diverting or interfering with the existing channel of a river, creek, stream or watercourse.

(iii) **Interference with Wetlands**

Interference with wetlands includes any development activities as listed above that may result in impacts to the hydrologic or hydrogeologic function of the wetland.

4.0 Section 28 Policies

4.1 General Policies Regarding Implementation/Interpretation

The implementation of this policy document will be guided by the following general policies:

(i) Development activity will not be undertaken in a regulated area without written permission from the Authority with the exception of the activities specifically identified under Section 5.1 that are deemed to have permission by the approval of these policies by the MVCA Board of Directors.

(ii) Where the regulated lands contain more than one regulated feature (i.e. part of a Provincially Significant Wetland that is also within the regulatory flood plain), the more restrictive policies will apply.

(iii) Further encroachments towards a hazard are not supported.

(iv) Approved filling activity in the flood plain, that inadvertently results in a change in the flood plain zone (e.g. floodway to flood fringe or non-floodplain), is not intended to facilitate future development. These lands will retain their original (pre-filling) designation for the purpose of implementing MVCA's Regulation Policies.

(v) The Appendices form part of the policies of this document.

(vi) Permits and Enforcement

Development in areas described in Ontario Regulation 153/06, requires a permit from MVCA. Each application shall be evaluated on its own merits, on a case-by-case basis, and consistent with the policies outlined in this document.

Development and/or interference undertaken in Regulated Areas without MVCA permission are in violation of the *Conservation Authorities Act.* Every person who contravenes Ontario Regulation 153/06 may be subject to a fine of not more than $10,000 or to a term of imprisonment of not more than three months (*Conservation Authorities Act,* R.S.O. 1990, c. C.27, s. 28 (16)).

If convicted, the party may be ordered to remove the development/interference at their own expense. The party may also be subject to a court order to rehabilitate.

Retroactive permits will require double the required fee as outlined in the approved Fee Schedule.

Note: *With the exception of works falling under Section 10.0 (Alterations to Shorelines and Watercourses), where feasible, the Authority will encourage the implementation of a minimum setback of 30 metres from the high water mark of any watercourse or wetland for new*

(constructed and/or hardened) development. Exceptions may be considered on a site-specific basis in areas of existing development, where the works will not encroach into the setback any further than the existing building/structure and where because of the size, configuration and physical layout of the property, no other alternative exists. Additional setbacks may be required as per other agency approvals, by-laws, regulations or guidelines.

5.0 Hazardous Lands - General Policies

As defined under the *Conservation Authorities Act*, hazardous land means lands that could be unsafe for development because of naturally occurring processes associated with flooding, erosion, dynamic beaches or unstable soil or bedrock. The following policies generally apply to all flood and/or erosion prone lands that are subject to this regulation. Additional policies for new and existing development are presented for each classification of hazard land further on in this document. The policies under this section do not apply to wetlands (See Section 9 for wetland policies).

Consistency with Provincial Policy Statement
These policies are intended to be consistent with the Section 3.1 of the Ontario government's "Provincial Policy Statement" issued under Section 3 of the *Planning Act* on May 1, 2020 and the "Technical Guide: River & Stream Systems Planning Policy Statement - Implementation Guidelines" (M.N.R., 2002). MVCA staff may also refer to the Technical Guide for guidance on more specific matters that may arise through the implementation of these policies.

5.1 Activities Deemed to Have Permission By Approval of These Policies

(i) The policies under this section do not apply to regulated areas associated with wetlands. (See Section 9 for wetland policies)

(ii) The following activities or works that are passive in nature and would not pose a threat to public safety if subject to flooding or erosion may be permitted within the Regulation Limit and by the approval of this policy document have the permission of Authority under Section 28 of the *Conservation Authorities Act*:

a) Passive non-structural activities involving no grading or alteration to the landscape, such as public or private recreation areas, agricultural crop land, or grazing.

b) Small Accessory Structures -One non-habitable accessory structures with a gross floor area less than 10 square metres. The Authority encourages that a minimum 7.5 m setback from the top of slope or the toe of a valley slope and/or a 15 m setback from the channel bank of any watercourse is maintained.

c) Fencing is considered exempt from permission required under the Section 28 regulation. However, where fencing is required in a regulated area where it could aggravate potential flood or erosion hazards, MVCA will recommend that the fencing is constructed in such a manner that it will not impede the conveyance of flow and will limit the potential for collection of debris during high flow/flooding events. Stone or concrete walls are not included under this exemption.

d) Minor Fill Placement - A onetime placement of fill, less than or equal to 10 m^3 in volume provided the following criteria are met:

- a minimum setback of 7.5 m from the top of slope and a minimum setback of 15 m from the channel bank of any watercourse, is maintained:
- the filled and re-graded area is immediately stabilized: and
- the fill does not have an effect on Regulatory Flood elevations as demonstrated to the satisfaction of the Authority.

e) Resurfacing of existing driveways and parking lots, where the final grade is within 50 mm of the existing grade.

f) The repair of an existing foundation.

g) Other minor development activities that, based on the size and scale of the proposal and the specific site conditions, the authority determines will not result in a negative impact to flood, erosion or the conservation of land.

5.2 Prohibited Uses

(i) Due to potential public safety concerns, the following uses, will be prohibited within the regulatory flood plain, the stable slope limit and the erosion hazard limit:

a) uses associated with the manufacture, collection, storage, disposal, and/or consumption of hazardous substances that may pose an unacceptable threat to public safety if they were to escape their normal containment/use as a result of flooding, failure of flood-proofing and/or protection works and/or erosion;

b) institutional and associated uses such as hospitals, nursing homes, pre-schools, day cares and schools, which may pose a significant threat to the safety of the inhabitants if involved in an emergency evacuation situation as a result of flooding, failure of flood-proofing and/or protection works, and/or erosion;

c) uses associated with essential services such as those provided by fire, police and ambulance stations and electrical substations that may be impaired during a flood emergency as a result of flooding, failure of flood-proofing, and/or protection works;

d) new stormwater management facilities

5.3 General Policies for Fill Placement, Excavation and Lot Grading

Activities subject to this section include but are not limited to placement of fill, excavations, stockpiling, site grading, the installation of sewage disposal systems, and other grade altering activities. The following polices apply to fill placement, excavation and lot grading where permitted by other policies within this document.

(i) Fill placement may be considered on flood plain lands only if flood plain storage volume impacts are addressed and upstream and downstream water levels and/or flow velocities related to increased flood risk or damage are unaffected. An acceptable hydraulic analysis may be required, at the discretion of the Authority, to ensure that these matters have been addressed.

(ii) Fill placement, excavation and lot grading activities must not adversely affect the flood and/or erosion susceptibility of buildings or properties located at the fill site, or upstream or downstream of the fill site.

(iii) Only clean fill may be placed.

(iv) Controls will be required to ensure that sediment transport from the fill site into adjacent watercourse, wetlands and other water bodies shall not occur. These controls must be in place before and during construction and until the site is permanently stabilized.

(v) For regulated areas in which fill placement, excavation or lot grading activities could result in slope instability, geotechnical analysis may be required at the landowner/applicant's expense.

(vi) Permitted fill placement, excavation and lot grading activities may be seasonally restricted and subject to a specified time frame.

(vii) Upon completion of permitted fill placement, excavation, and lot grading activities, the landowner/applicant may be required to submit a plan to the Authority showing that finished grades are in accordance with the grading plan approved by the Authority. This plan shall be prepared and certified by a Professional Engineer or Ontario Land Surveyor and must be referenced to geodetic datum. The submission must be received within 30 days following completion of the fill operation.

(viii) Fill placement, excavation and lot grading activities will not be permitted where it may result in pollution and/or adversely affect conservation of land.

(ix) The authority may waive any of the above requirements where there will clearly be no detrimental effects on the control of flooding, erosion, pollution or the conservation of land.

(x) Fill placement, excavation and lot grading activities for septic systems must be limited to the required area and depths as specified by the approving agency under Part 8 of the Ontario Building Code (OBC).

(xi) Under certain circumstances an incrementally balanced cut and fill may be considered according to the guidelines set out under Appendix C.

(xii) Fill imported on site for grading, backfilling, floodproofing or road construction may require confirmation for suitability by a Professional Engineer or a Professional Geoscientist licensed in the Province of Ontario.

6.0 Flood Plain Policies

6.1 General Flood Plain Policies

(i) The limits of the regulatory flood plain are defined by the 1:100 year flood level.

(ii) With the exception of those areas subject to the policies under 6.1(iii) and 6.3, the flood plain shall consist of one zone defined by the Regulatory Flood Standard. Where the one zone concept is applied, the entire flood plain is treated as floodway (Figure 1.)

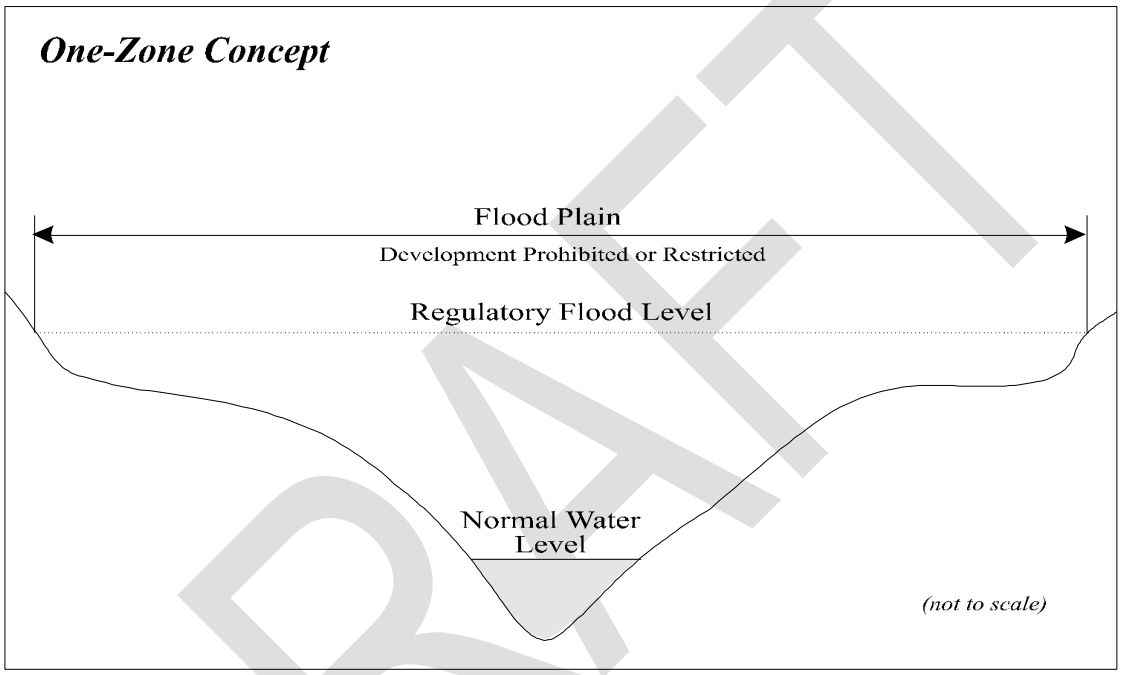


Figure 1. One-Zone concept flood plain and regulatory flood levels

(iii) The two-zone (floodway-flood fringe) concept shall be applied only in specific areas where it has been adopted by the Conservation Authority, in cooperation with the member municipality. The areas where the two-zone concept has been adopted are described in Appendix D.

(iv) For proposals involving a building, where the exterior wall or a portion of that wall abuts the limit of the regulatory flood plain or a portion of the building encroaches into the flood plain the following shall apply:

a) Where the existing grades are such that the structure would be subject to greater than 0.3 m (1 ft) depth of flooding during a 1:100 year flood event or more than 50% of the existing footprint is in the floodplain, the structure will be considered as flood susceptible and the flood plain policies under Section 6 of this document shall apply.

b) Where the existing structure would be subject to less than 0.3 m (1 ft) depth of flooding during a 1:100 year flood event and less than 50% of the existing footprint is in the floodplain, the Authority may consider permitting expansions, enlargement or redevelopment of the existing structure in accordance with the policies under 6.3.3, 6.3.4, 6.3.5 and 6.3.6.

6.1.1 Agricultural Uses

(i) Within the flood hazard limits (regulatory flood plain and associated regulation limits), the use of land for ongoing cropland, grazing, orchards and nurseries, and associated activities such as plowing and fencing, are not considered site alterations provided there is no alteration to existing grades.

(ii) The construction of farm buildings (excluding residences, commercial greenhouses and large-scale enclosed livestock facilities) may be considered within the flood hazard limit, where there is no reasonable site for the proposed works outside of the flood hazard limit and where the buildings will be floodproofed.

6.1.2 Parking Lots, Driveways and Roads

(i) A parking lot, driveway or road may be permitted within the flood hazard limit (regulatory flood plain and associated regulation limit) subject to the following criteria:

a) where the flood plain is within an apparent valley, a parking lot, driveway or road is permitted only within a property containing existing development where there is acceptable access to the site;

b) where the flood plain is within a non-apparent valley, the parking lot, driveway or road must be located outside of the meander belt allowance*;*

c) the existing pre-development grade is not more than 0.3 metres below the regulatory flood elevation;

d) the parking lot, driveway or road is designed to account for access and egress under regulatory flood conditions;

e) driveways and access routes to access high points of land completely surrounded by the Regulatory flood plain within flood susceptible properties shall not be permitted;

f) to minimize the amount of fill and grading used in the construction of the parking lot, driveway or roadway, the Authority will require at-grade construction wherever feasible.

6.1.3 Development within 15 Metre Adjacent Allowance

(i) Development may be permitted within the 15 metres allowance adjacent to the flood plain, subject to information and site plans being submitted to demonstrate the following:

a) the development does not create or aggravate the flood hazard;

b) the development does not change drainage or vegetation patterns that would impact the flood plain;

c) safe access in accordance with the guidelines under Appendix B;

d) floodproofing in accordance with Appendix B, may be required;

e) fill placement and/or lot grading does not modify the extent of the flood plain or impact adjacent properties.

6.2 Floodway Policies

The policies under this section apply to:

a) The entire flood plain in all areas where the One-Zone concept is applied.

b) The floodway, as defined in Appendix A, in all areas where the Two-Zone concept is applied (Appendix D).

6.2.1 Fill and Lot Grading in the Floodway

Filling in the flood plain can result in negative impacts on water flow and storage capacity of the flood plain which can cause or increase flooding and/or erosion on other nearby properties. Filling in the flood plain can also cause sedimentation which can impact water quality. To prevent these negative impacts, fill placement and lot grading activities within the floodway are generally restricted to what is required for floodproofing purposes. The placement of fill for landscaping purposes is generally not permitted.

In addition to policies 5.3, proposals involving fill and/or lot grading in the floodway shall be subject to the following:

(i) Fill and lot grading activities shall not be permitted within a floodway except as permitted under, or in association with, the following policies.

(ii) Minor site grading, without the introduction of new material, may be permitted provided there is no change in the flood-fringe or floodway designation. A vegetated buffer in the near shore riparian area must be maintained or established.

(iii) Fill placement and lot grading may be permitted for floodproofing purposes to the minimum amount required in accordance with guidelines under Appendix B in relation to constructed development as permitted under Section 6.2.3 (minor additions) and Sections 6.2.6 and 6.2.7 (replacement buildings).

(iv) Fill placement and lot grading may be permitted and site-servicing works including access as permitted under Section 6.1.2 (see floodproofed access requirements under Appendix B) or the replacement of a sewage disposal system if an alternative site outside of the flood plain does not exist.

(v) Fill placement and lot grading for septic systems shall be limited to the required area and depths as specified by the septic system approval agency. The design of the septic system should minimize the amount of fill placement in the flood plain.

(vi) The placement of fill at the shoreline for shoreline stabilization and/or erosion control purposes may be permitted in accordance with the policies under Section 10.

(vii) A one-time placement of less than or equal to 10 m^3 of imported fill is permitted in the flood plain provided the flow of flood water is not impeded.

6.2.2 New Buildings

(i) New buildings (including residential, commercial, industrial and institutional uses) shall not be permitted in the floodway except as permitted under Section 6.2.5, 6.2.6, 6.2.8 6.2.9, and 6.2.13.

6.2.3 Additions to Existing Buildings

(i) An enclosed minor addition onto an existing building may be permitted in any part of the flood plain including the floodway where it can be demonstrated that:

a) the size of the addition does not exceed 20% of the gross floor area of the existing building or 20 square metres (215 square feet), whichever is less;

b) the number of dwelling units is not increased;

c) all habitable floor space is at or above the existing ground floor elevation, no basement is proposed and any crawl space is non-habitable and designed to facilitate services only in accordance with floodproofing requirements under Appendix B.

(ii) An addition resulting in an increase of between 20% and 50% in gross floor area but not exceeding 50 square metres (538 square feet) may be permitted in the floodway provided

all of the following provisions are met:

a) the addition meets the floodproofing provisions outlined in Appendix B; and

b) the number of dwelling units is not increased;

c) access is safe as per Appendix B.2 (Safe Access / Egress).

(iii) Additions that exceed 50 square metres are not permitted in the floodway.

(iv) Additions that will result in a cumulative enlargement exceeding (i) and/or (ii) and/or (iii) above, as based on the original gross floor area, shall not be permitted (in the floodway). This will be determined based on the total floor area of all additions constructed after the date that the original MVCA Regulation came into effect on May 15, 1988.

(v) Where possible, the addition shall be located outside the flood plain or to the least flood susceptible location within the property.

(vi) Additions that are open and peripheral in nature such as an open deck or carport shall be subject to the policies under Section 6.2.4(attached) and 6.2.9(detached).

6.2.4 Open Additions (attached)

The following policies apply to any addition designed as an open construction (such as a deck, porch, and carport) or at grade patio that is to be attached to an existing structure. For the purposes of these policies, an open structure is defined as a structure with no walls, which is constructed on piers or an above-grade foundation, for use as outdoor living area or storage area.

(i) An open addition onto an existing building maybe permitted in the floodway subject to all of the following criteria:

a) the total building area of all attached open structures (existing and new) shall not exceed 20 square metres. Where there are existing open structures attached to the building that already exceed 20 square metres in building area, additional open structure shall not be permitted;

b) the structure is properly anchored to the ground to prevent flotation in the event of a flood;

c) water storage will not be reduced and flood flows not be impeded;

d) it is designed to allow for the free flow of water, under, over and around the structure.

(ii) The enclosure of an existing open addition shall be treated as a minor addition and shall be subject to the policies of Section 6.2.3. Enclosure is defined as any of the following activities:

a) the construction of a foundation under the structure, and/or

b) the construction of walls on any side(s) of the structure.

(iii) The extension of a roof or awning over on open addition is permitted.

(iv) Open structures that are not attached to the main building are subject to the policies under Section 6.2.9.

6.2.5 Replacement of Buildings Destroyed by Fire or Natural Causes

Any building located in the flood plain that has been destroyed by forces beyond the owner's control, other than flooding, may be rebuilt provided all of the following criteria are met:

(i) The former building was in a habitable condition prior to its destruction and the permit application for reconstruction/replacement of the destroyed building is received by Mississippi Valley Conservation Authority within 18 months of the date that the structure was destroyed. Evidence of this must be provided by the landowner/applicant to the satisfaction of the Authority.

(ii) Buildings located in the floodway will be permitted to be replaced subject to the following:

a) the replacement building is designed so that it is not more flood susceptible than the original building (i.e. the floor elevation of the replacement dwelling is at the same elevation or higher than the original building);

b) the gross floor area and the footprint of the replacement building is the same or less than the original building;

c) the resulting use of the replacement building is the same or a less intensive than the use of the original building; and

d) the replacement building contains the same number of, or fewer, dwelling units.

(iii) Proposals involving the reconstruction of an existing building to a larger size will be subject to the policies for additions under 6.2.3 and 6.2.4.

(iv) The replacement/reconstruction of a building destroyed as a result of natural flooding from the watercourse will be considered as new construction and the corresponding policies for new buildings generally shall apply. Any new construction will be evaluated on a case by case basis and will consider velocity and flood plain storage impacts.

(v) The Authority will require, that the replacement building be floodproofed to the regulatory flood standard or and relocated outside the flood plain or to the least flood susceptible location within the property.

6.2.6 Replacement/Reconstruction of Existing Buildings

The following section applies to the voluntary replacement/reconstruction of existing buildings that have not been destroyed by fire or natural causes. This does not apply to unsafe abandoned buildings. In reviewing proposals to reconstruct existing buildings located in the floodway, it is the Authorities goal to achieve a net gain in terms of reducing the level of risk associated with

the development. It is the intent of the Authority to allow the continued existing use of the building provided the following policies are addressed:

(i) Where possible, the replacement building is located outside the flood plain or to the least flood susceptible location within the property.

(ii) Proposals involving the reconstruction of an existing building to the same or smaller gross floor area and the same or smaller footprint of the original building shall be permitted provided the number of dwelling units is not increased.

(iii) Proposals involving the reconstruction of an existing building to a larger size will be subject to the policies for additions under 6.2.3, 6.2.4 and 6.2.5.

(iv) The reconstruction must be floodproofed in accordance with the floodproofing guidelines outlined in Appendix B.

(v) For buildings that have been demolished prior to the date of submission of the application, the landowner/applicant must provide proof to the satisfaction of the Authority, confirming that the building existed within the 18 months prior to the date of the submission of the application and confirming the gross floor area and location of the building.

(vi) Permission will not be granted for the reconstruction of unsafe abandoned buildings in the floodway.

6.2.7 Foundation Reconstruction

(i) The construction of a new foundation under an existing building located within the regulatory flood plain will be permitted provided that accepted floodproofing and erosion control measures are incorporated into the foundation design.

(ii) Applications for the construction of a new foundation in combination with the construction of an addition shall also be subject to the applicable policies for additions as set out in this document.

(iii) Repair of existing foundation is permitted if less than 50% of the existing foundation is replaced.

6.2.8 Auxiliary Buildings

(i) Non-residential auxiliary buildings with a gross floor area larger than 10 square metres and up to 50 square metres (total of all combined auxiliary structures) may be permitted in the floodway provided that:

a) it is located in an area where the depth of flooding does not exceed 0.3 metres and it is firmly anchored to withstand the effects of flooding without structural damage;

b) it is floodproofed;

c) the building contains no habitable space;

d) the building is detached.

(ii) Agricultural buildings may be exempt from the above requirements depending on location, use, local conditions, etc. (see also the policies under Section 6.1.1).

(iii) Permitted auxiliary buildings shall be located outside the flood plain or to the least flood susceptible location within the property.

6.2.9 Open Structures (detached)

The following policies apply to any stand-alone (detached) structure of open construction, such as a deck, carport, gazebo or picnic shelter.

(i) For the purposes of these policies, an open structure is defined as a structure with no walls, except for use as outdoor living area, recreational area or storage area.

(ii) To be considered detached it must be located at least 1.5 metres from the main building. Any open structures within 1.5 metres of a building shall be considered attached and shall be subject to the policies under Section 6.2.4.

(iii) An open structure may be permitted in the floodway provided the following policies are met:

a) the primary use is already established on the property (ex. there is already a dwelling on the property);

b) the total building area of all detached open structures (existing and new) shall not exceed 20 square metres;

c) the structure is properly anchored to the ground to prevent flotation in the event of a flood;

d) the structure is designed to allow for the free flow of water, under, over and around the structure; and

e) water storage will not be reduced and flood flows not be impeded.

(iv) The enclosure of an existing open structure shall not be permitted. Enclosure includes the following activities:

a) the construction of a foundation under the structure, and/or

b) the construction of walls on any side(s) of the structure.

(v) The construction/installment of a roof, awning or other covering over on open addition may be permitted.

6.2.10 Institutional Uses and Emergency Services

(i) Development associated with institutional uses and emergency services as described under Section 5.2 are not permitted in the floodway.

6.2.11 Swimming Pools

(i) The construction/placement of an above-ground or in-ground pool is not permitted in the floodway.

6.2.12 Portable (Mobile) Buildings

(i) Permanent placement of portable (mobile) building is not permitted in the floodway.

(ii) Temporary placement for seasonal/recreational use is permitted provided the building is moved out of the hazard area before spring freshet.

6.2.13 Boathouses

(i) A boathouse with a gross floor area larger than 10 square metres and up to 50 square metres may be permitted in the floodway provided that:

a) the design of the boathouse meets the definition of a boathouse in Appendix A;

b) the boathouse contains no habitable space;

c) the boathouse is detached;

d) electrical servicing is floodproofed;

e) there is a maximum of one boathouse per lot.

6.3 Flood-fringe Policies

In areas where the Two-Zone Concept is applied, the flood fringe means the outer portion of the flood plain between the floodway and the regulatory flood line (Figure 2). Flood depths and velocities tend to be less severe in the flood fringe as compared to those in the floodway. The flood fringe defines the area where development may be permitted subject to appropriate floodproofing.

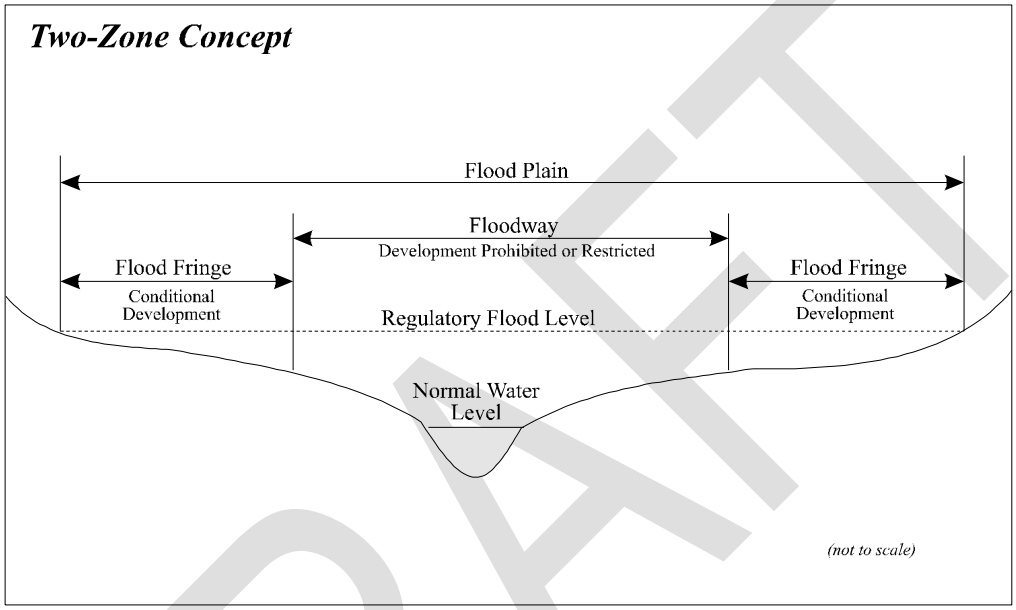


Figure 2. Two-Zone concept regulatory flood levels

The following policies apply only to the flood fringe portion of the flood plain in areas where the Two-Zone concept is applied, as described in Appendix D. For development proposed in the floodway portion of the flood plain, the policies for floodway under Section 6.2 shall apply.

6.3.1 Fill and Lot Grading in the Flood Fringe

The following policies for fill placement and/or lot grading in the flood fringe are in addition to the general fill and lot grading policies under Section 5.3 and applicable policies for access/parking (6.1.2) and for floodproofing (Appendix B).

(i) Fill placement and or lot grading for the purpose of floodproofing may be permitted in the flood fringe provided all of the following criteria can be met.

a) Fill placement and/or grading must be carried out in a way that will not result in additional runoff/drainage being directed onto adjacent properties.

b) Where a lot is being filled and/or graded to an elevation that exceeds the grade of an adjacent property, and where an adequate drainage swale does not already exist, a grassed drainage swale may be required for the area between the fill area and the lot line.

c) Where a drainage swale is required it must be designed in accordance with the guidelines under Appendix B.

d) Fill placement and lot grading for the purpose of providing a fill apron shall also be subject to the guidelines under Appendix B.

6.3.2 New Residential Buildings

The following polices apply to residential buildings and/or buildings all or part of which are used for human habitation. For commercial, industrial or agricultural buildings see the applicable policies under Section 6.3.10.

(i) A new residential building may be permitted in the flood fringe provided that:

a) wherever possible, the new residential building should be located outside the flood plain or to the least flood susceptible location within the property;

b) the building is floodproofed in accordance with Appendix B;

c) access is safe in accordance with Appendix B.

6.3.3 Minor Additions to Residential Buildings

(i) In two zone flood plain areas, a minor addition onto an existing building may be permitted in any part of the flood plain, subject to the following:

a) In the floodway, minor additions shall be subject to the policies for minor additions under Section 6.2.3.

b) In the flood fringe, an addition that will increase the original gross floor area of the existing building by less than 20%, the addition shall not be more vulnerable to flooding than the existing building (where possible protection to the 100 year flood level should be provided).

c) In the flood fringe, an addition that will increase the original gross floor area of the existing building by 20% to 50%, to a maximum of 50 square metres, the addition shall be floodproofed in accordance with the floodproofing guidelines as outlined in Appendix B.

d) All additions constructed after May 15, 1988 will be counted toward the maximum allowable increase in floor area and footprint.

e) It is located outside the flood plain or to the least flood susceptible location within the property.

Note: In areas serviced by private on-site services, certification from the applicable septic system approval authority may be required to confirm the existing septic system will sustain the proposed use.

6.3.4 Major Additions to Residential Buildings

(i) In two zone flood plain areas major additions may be permitted in the flood fringe only, subject to following:

a) the addition is located within the flood fringe only and no part of the addition extends into the floodway;

b) for an addition that will increase the original gross floor area of the existing building greater than 50% or 50 square metres, the addition must be floodproofed in accordance with the floodproofing guidelines as outlined in Appendix B and the landowner/applicant must demonstrate that every reasonable effort has been made to floodproof the original gross floor area of the building;

c) access is floodproofed in accordance with the guidelines of Appendix B;

d) it is located outside the flood plain or to the least flood susceptible location within the property.

e) the replacement building contains the same number of, or fewer, dwelling units.

Note: In areas serviced by private on-site services, certification from the applicable septic system approval authority may be required to confirm the existing septic system will sustain the proposed use.

6.3.5 Open Additions

The following policies apply to any addition designed as an open construction, such as a deck, porch, and carport, or above grade patio, which may be either attached or detached from the main structure. For the purposes of these policies, an open structure is defined as a structure with no walls, except for railings, which is constructed on piers or an above-grade foundation, for use as outdoor living area or storage area.

(i) An open addition onto an existing building may be permitted in the flood fringe subject to all of the following criteria:

a) the structure is properly anchored to the ground to prevent floatation in the event of a flood;

b) water storage will not be reduced and flood flows not be impeded;

c) it is designed to allow for the free flow of water, under, over and around the structure.

(ii) The enclosure of an existing open addition shall be treated as an addition and shall be subject to the applicable policies under Section 6.3.3 (minor additions) or 6.3.4 (major additions), depending on the size of the area to be enclosed. Enclosure is defined as any of the following activities:

a) the construction of a foundation under the structure, and/or

b) the construction of walls on any side(s) of the structure.

(iii) The extension of a roof or awning over on open addition is permitted.

6.3.6 Replacement/Reconstruction of Residential Buildings

The replacement/reconstruction of an existing residential building in the flood fringe shall be subject to the policies for New Residential Buildings, under Section 6.3.2, the policies for Minor Additions to Residential Buildings, under Section 6.3.3 and the policies for Major Additions to Residential Buildings, under Section 6.3.4.

6.3.7 Foundation Reconstruction or Replacement

See policies under Section 6.2.7

6.3.8 Auxiliary Buildings

(i) A non-residential auxiliary building with a gross floor area larger than 10 square metres and up to 50 square metres may be permitted in the flood fringe provided that:

a) it is firmly anchored to withstand the effects of flooding without structural damage;

b) it is floodproofed in accordance with the guidelines of Appendix B;

c) the building contains no habitable space;

d) the building is detached.

(ii) The auxiliary building shall be located outside the flood plain or to the least flood susceptible location within the property.

(iii) Agricultural buildings may be exempt from the above requirements depending on location, use, local conditions, etc. (see also the policies under Section 6.1.1).

6.3.9 Open Structures (detached)

See policies under Section 6.2.9

6.3.10 Commercial and Industrial Buildings

(i) A commercial or industrial building may be permitted in the flood fringe provided that:

a) the building is floodproofed in accordance with the floodproofing guidelines outlined in Appendix B;

b) there is no storage/ containment of hazardous materials or chemicals which could pose an unacceptable threat to public safety (ex. contamination/deterioration of water quality);

c) a foundation design and site grading plan is prepared by a professional engineer, at the applicant's expense, to the satisfaction of the Authority.

(ii) The Authority will also recommend that the building shall be located outside the flood plain or to the least flood susceptible location within the property.

(iii) Additions onto existing commercial or industrial buildings in the flood fringe shall be subject to the applicable floodproofing guidelines under Appendix B.

6.3.11 Portable (Mobile) Buildings

(i) The permanent placement of a portable (mobile) building may be permitted in the flood fringe provided that the building is floodproofed in accordance with the floodproofing guidelines as outlined in Appendix B; it is firmly anchored to withstand the effects of flooding without structural damage; and access is safe in accordance with Appendix B.

(ii) The Authority will require that where possible, the mobile building shall be located outside the flood plain or to the least flood susceptible location within the property.

6.3.12 Swimming Pools

(i) Swimming pools will be permitted within the flood fringe area subject to the following:

a) where an alternative area outside of the flood plain does not exist;

b) electrical servicing must be floodproofed;

c) potential impacts to flood conveyance may impact the location and design.

Concerns regarding swimming pools in the flood plain are outlined in Appendix B.

6.3.13 Boathouses

(i) A boathouse with a gross floor area larger than 10 square metres and up to 50 square metres may be permitted in the flood fringe provided that:

a) the design of the boathouse meets the definition of a boathouse in Appendix A;

b) the boathouse contains no habitable space;

c) the boathouse is detached;

d) electrical servicing is floodproofed;

e) there is a maximum of one boathouse permitted per lot.

6.4 Safe Access/Egress Policies

In areas where the property has suitable area to construct above the 1:100 year flood plain; however, access to the property does not meet safe access standards, development may be permitted subject to the following:

(i) a new or replacement residential building may be permitted provided that access is made safe in accordance with the guidelines under Appendix B.2.

(ii) a minor addition onto an existing building may be permitted, subject to following:

a) the addition will not increase the original gross floor area of the existing building by more than 50 square metres,

b) all additions constructed after May 15, 1988 will be counted toward the maximum allowable increase in the original gross floor area.

(iii) a major addition (i.e. greater than a 50 square metres of the original gross floor area) may be permitted, provided that safe access is established in accordance with the guidelines of Appendix B.

7.0 River Bank and Steep Slope Policies – Apparent Valley

The policies under this section apply in areas where there is an apparent valley and where potential erosion and/or slope instability are the operative hazards. For development within the erosion hazard (meander belt) of a not apparent river or stream valleys refer to the policies in Section 8.0.

7.1 General Policies

(i) As defined in the Mississippi Valley Conservation Authority - Reference Manual for the Preparation of Regulation Schedules, February 2005 (3.2(I)) the regulation limit of banks associated with watercourses is based on three components: an erosion allowance; a stable slope limit; and a 15 m allowance setback (Figure 3).

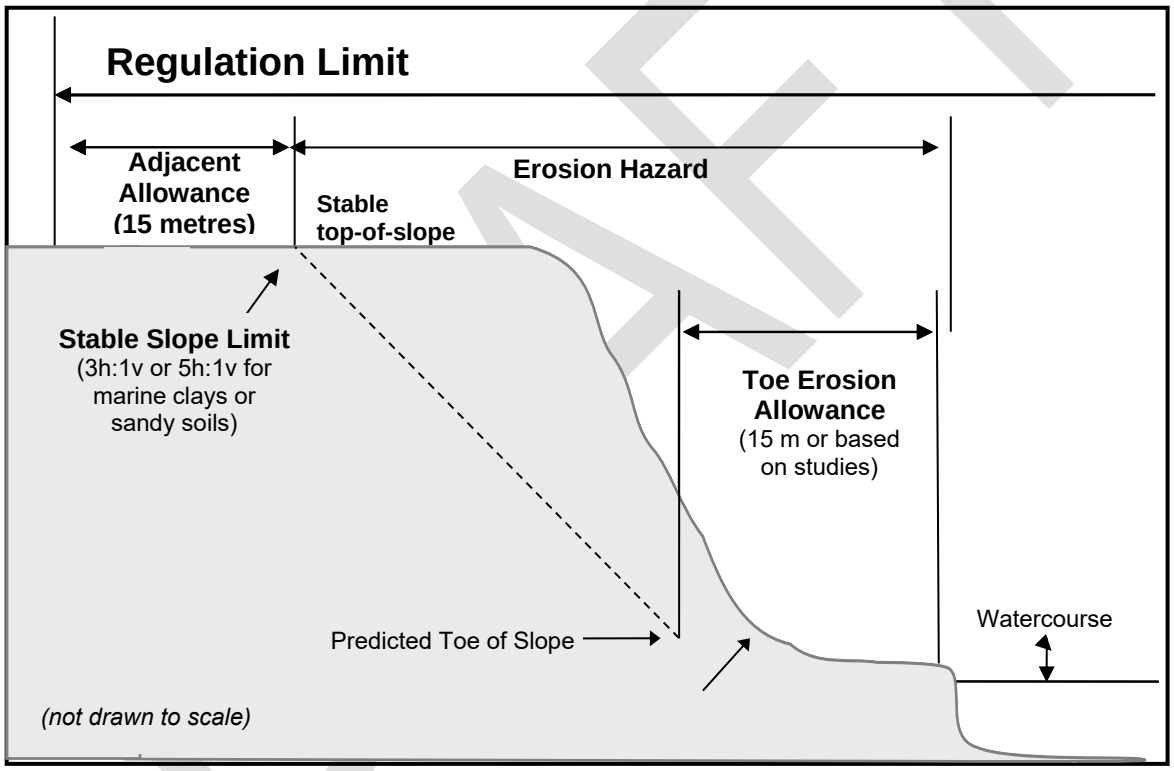


Figure 3. Cross Sectional Diagram Showing Components of Slope Regulation Limit

(ii) Where these standard criteria for determining the hazard limits are deemed insufficient or where the identified setbacks come into question, a geotechnical slope evaluation by a Professional Engineer (Appendix E) may be required, at the landowner/applicant's expense, for any new development proposed in the vicinity of a steep bank or slope.

(iii) Development and/or land uses that may be susceptible to damage from erosion or may cause or aggravate bank erosion or slope failure will not be permitted.

7.2 Development Policies

In areas of known risk where, based on soils mapping or through more detailed geotechnical analysis, the soil composition is identified as a sensitive marine (Leda) clay, the following shall apply:

a) A geotechnical assessment, completed by a qualified accredited professional at the landowner's cost to confirm that the lot can be safely developed and to address all of the requirements outlined in Appendix E, must be prepared for review and approval by the Authority.

7.2.1 Development within 15 Metre Adjacent Allowance

(i) Development may be permitted within the 15 metre allowance, without the need for a geotechnical assessment, subject to information and site plans being submitted to demonstrate the following:

a) The development does not create or aggravate an erosion hazard;

b) the development is set back a sufficient distance from the stable top of bank to avoid increases in loading forces on the top of the slope;

c) the development does not prevent access to and along the top of the valley slope (wherever feasible the development should be designed to provide a minimum 6 metre access allowance along the top of the slope);

d) the development does not change drainage or vegetation patterns that would compromise slope stability or exacerbate erosion of the slope face;

e) the potential for surficial erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans; and

f) natural features and/or ecological functions contributing to the conservation of land are protected, pollution is prevented and flooding hazards have been adequately addressed.

(ii) To ensure slope stability will not be compromised, standard mitigation measures may be required as part of the submitted plans and/or as conditions of approval. They may include:

a) measures to address potential drainage impacts;

b) requirements to ensure that access (for emergency vehicles, equipment and machinery for repair and maintenance work, etc.) to and along top of slope is maintained;

c) stabilization and/or sediment control measures to prevent surficial erosion.

(iii) Plans should be designed to maintain an access allowance along the stable top of bank in order to provide access during emergencies and for regular maintenance or repair of failed structure or slopes. In keeping with the Natural Hazard guidelines for the Provincial Policy Statement an access allowance of 6 metres from the stable top of bank is recommend as a sufficient safety zone for people, vehicles and equipment to enter and exit an area during an emergency such as a slope failure and to provide room for equipment to carry out maintenance repairs to the building or the slope.

(iv) Where the above requirements under 7.2.1(i) have not been met to the satisfaction of the Authority, it may be a requirement that geotechnical assessment completed by a qualified accredited professional be carried out at the landowner's cost to confirm that the lot can be safely developed and to address all of the requirements outlined in Appendix E.

(v) Swimming pools may only be permitted subject to the following criteria :

a) a geotechnical assessment by a qualified engineer (at the expense of the applicant), may be required to determine the location of the stable top of bank and to determine if the proposed development would have a negative impact on slope stability; and

b) a 6 metre setback from the stable top of bank is provided in order to provide for an erosion access allowance as per the Provincial Policy Statement.

7.2.2 Development within the Erosion Hazard

7.2.2.1 Development Not Permitted

(i) Development associated with the following uses will not be permitted within the erosion hazard of an apparent river valley:

a) Institutional uses associated with hospitals, nursing homes, preschool, school nurseries, day care and schools, where there is a threat to the safe evacuation of the sick, the elderly, persons with disabilities or the young during an emergency as a result of erosion and/or failure of protection works/measures; or

b) Essential emergency services such as those provided by fire, police and ambulance stations and electrical substations which would be impaired during an emergency as result of erosion, or any other hazard associated with erosion and/or as a result of failure of protection works/measures; or

c) Uses associated with the disposal, manufacture, treatment or storage of hazardous substances.

7.2.2.2 Permitted Development

(i) The following may be permitted within the erosion hazard if it has been demonstrated to the satisfaction of the Conservation Authority that the control of flooding, erosion, pollution, or the conservation of land will not be affected :

a) Development associated with public parks (e.g. passive or low intensity outdoor recreation and education, traill systems);

b) Minor development associated with existing uses as per the applicable policies for minor additions, replacement structure, replacement septic systems;

c) Minor removal and placement of fill and site grading;

d) Stream bank, slope and valley stabilization to protect existing development or conservation or restoration projects, subject to the activity being approved through a satisfactory Environmental Assessment process for large scale projects;

e) Public infrastructure (e.g. roads, sewers, flood and erosion control works) and various utilities (e.g. pipelines) subject to the activity being approved through a satisfactory Environmental Assessment process.

In all cases, the provisions for safe access as outlined in Appendix B must be met.

7.2.2.3 New Buildings

(i) New buildings are not permitted within the erosion hazard of an apparent river or stream valley.

(ii) Minor encroachments: Where there is insufficient area to place the development entirely outside of the stable slope limit, the authority may permit minor encroachment of part of a new building into the stable slope limit provided it is located where it will be least susceptible to damage and subject to the following requirements:

a) A geotechnical assessment completed by a qualified accredited professional must be carried out at the landowner's cost to confirm that the lot can be safely developed and to address all of the requirements outlined in Appendix E must be prepared for review and approval by the Authority.

b) The new development must incorporate all structural, landscaping and surface drainage requirements that are recommended through the geotechnical evaluation.

7.2.2.4 Additions to Existing Building

(i) Within the stable slope allowance, but outside of the toe erosion allowance, a minor addition to an existing building may be permitted subject to the following criteria:

a) the size of the minor addition does not exceed 20% of the original gross floor area, or 40 square metres whichever is less;

b) the addition does not extend any further into the stable slope limit than the existing building;

c) the addition does not extend into the toe erosion allowance;

d) the Authority may require that the proposal is supported by a geotechnical evaluation demonstrating that the development activities will not aggravate the hazard and that the slope is stable enough to support both the existing dwelling and the addition.

(ii) Additions exceeding 20% of the gross floor area or 40 square metres may be permitted subject to all of the following criteria being met:

a) the size of the minor addition does not exceed 50% of the original gross floor area, or 50 square metres whichever is less;

b) a geotechnical assessment completed by a qualified accredited professional at the landowner's cost to confirm that the lot can be safely developed and to address all of the requirements outlined in Appendix E must be prepared for review and approval by the Authority;

c) the new development must incorporate all structural, landscaping and surface drainage requirements that are recommended through the geotechnical evaluation;

d) the addition does not extend any further into the stable slope limit than the existing building;

e) the addition does not extend into the toe erosion allowance.

7.2.2.5 Reconstruction/Replacement of an Existing Building

(i) The reconstruction or replacement of a building within the erosion hazard of an apparent river or stream valley may be permitted provided that it has not been damaged or destroyed by erosion and it has been demonstrated to the satisfaction of the Conservation Authority that the control of flooding, erosion, pollution or conservation of land will not be affected. The submitted plans should demonstrate that the building:

a) cannot be relocated to an area outside the erosion hazard and if there is no feasible alternative site, that it is located in an area of least (and acceptable) risk;

b) will be protected from the erosion hazard through incorporation of appropriate building design parameters; and

c) the replacement does not encroach any closer to the stable top of bank than the existing development at its closest point.

(ii) Where the existing development is closer than 6 metres to the stable top of bank, the replacement structure must be situated at least 6 metres of the top of bank to provide for an erosion access allowance.

(iii) A geotechnical study may be required at the expense of the applicant, by a qualified geotechnical engineer to determine the location of the stable top of bank and to determine if the proposed development will have a negative impact on slope stability.

(iv) Reconstructions and replacement which propose an increase in gross floor area or footprint that exceed the original structure shall be subject to the policies for additions under Section 7.2.2.4.

7.2.2.6 Sewage Disposal Systems

(i) The replacement of sewage disposal systems may only be permitted within the erosion hazard of an apparent river or stream valley where all of the following criteria can be met:

a) there is no feasible alternative location outside of the erosion hazard;

b) the septic system does not extend into the toe erosion allowance and it is located in the area of lowest risk;

c) a geotechnical assessment completed by a qualified accredited professional is carried out at the landowner's cost to confirm that the development activities will not aggravate the hazard and that the slope is stable enough to support the development that is proposed;

d) the design of the system must incorporate all structural, landscaping and surface drainage requirements that are recommended through the geotechnical evaluation.

(ii) A new sewage disposal system shall not be permitted with the erosion hazard of an apparent river or stream valley.

7.2.2.7 Access, Driveways, Private Roads

(i) Development associated with the construction of a driveway or access way through the erosion hazard of an apparent river or stream valley in order to provide access to lands outside of the apparent river or stream, valley, may be permitted subject to the following:

a) there is no viable alternative outside of the regulated area, and

b) the provisions for safe access as outlined in Appendix B are addressed.

(ii) Depending on the site characteristic and the scale of the proposed access, the Authority may require that the application is supported by a geotechnical evaluation demonstrating that the development activities will not aggravate the hazard and that the slope is stable enough to support both the development that is proposed.

7.2.2.8 Fill Placement, Excavation or Grading Activities

(i) Minor lot grading excavation or fill placement may be permitted where it is undertaken in association with any of the uses permitted above and/or for slope stabilization, erosion control or floodproofing purposes may be permitted within the erosion hazard.

(ii) Depending on the site characteristic and the scale of the proposal, the Authority may require that the application is supported by a geotechnical evaluation demonstrating that the development activities will not aggravate the hazard and that the slope is stable enough to support the development that is proposed.

7.2.2.9 Swimming Pools

(i) Swimming pools shall not be permitted with the erosion hazard of an apparent river or stream valley.

8.0 Policies for Meander Belt (Erosion Hazard) - Not Apparent Valley

8.1 Development within the Adjacent Allowance – Not Apparent Valley

The following policies apply to the allowance adjacent to the erosion hazards associated with not apparent valleys. For development within the erosion hazard (meander belt) of a not apparent river or stream valleys refer to the policies in Section 8.2.

(i) Development may be permitted within the allowance adjacent to the meander belt if it has been demonstrated to the satisfaction of the Conservation Authority that the control of flooding, erosion, pollution or the conservation of land will not be affected. The submitted plans should demonstrate that:

a) the development does not create or aggravate the erosion hazard;

b) the development does not prevent access to and along the meander belt;

c) the potential for surficial erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans;

d) natural features and/or ecological functions contributing to the conservation of land are protected, pollution is prevented, and flooding hazards have been adequately addressed.

8.2 Development within the Erosion Hazard (Meander Belt)

The following policies apply to the erosion hazards associated with not apparent valleys.
For development within the allowance adjacent to not apparent (unconfined) river or stream valleys refer to the policies in Section 7.

8.2.1 Development Not Permitted within the Erosion Hazard (Meander Belt)

(i) Except as permitted under 8.2.2. new development shall not be permitted within the meander belt of a not apparent river or stream valley.

(ii) Development associated with the following activities or uses shall not be permitted within the erosion hazard (meander belt) of a not apparent river or stream valley.

a) institutional uses, essential emergency services and/or uses associated with hazardous substances as specified in 5.2;

b) stabilization works to allow for future/proposed development or to provide for an increase in development envelope/area;

c) stormwater management facilities.

8.2.2 Development Permitted within the Erosion Hazard (Meander Belt)

(i) Notwithstanding 8.2.1 certain development within the erosion hazard (meander belt) may be permitted under the policies of 8.2.2(ii), 8.2.2.1, 8.2.2.2, 8.2.2.3 and 8.2.2.4 if it has been demonstrated to the satisfaction of the Conservation Authority that the control of flooding, erosion, pollution or the conservation of land will not be affected. The submitted plans should demonstrate that:

a) the development does not create or aggravate the erosion hazard;

b) the development does not prevent access to and along the meander belt;

c) the potential for surficial erosion has been addressed through proper drainage, erosion and sediment control and site stabilization/restoration plans;

d) natural features and/or ecological functions contributing to the conservation of land are protected, pollution is prevented and flooding hazards have been adequately addressed.

(ii) Development associated with the following activities/uses may be permitted within the erosion hazard (meander belt) of a not apparent river or stream valley subject to the activity being approved through a satisfactory Environmental Assessment process (if required):

a) development associated with public parks (e.g. passive or low intensity outdoor recreation and education, trail systems);

b) public infrastructure (e.g. roads, sewers, flood and erosion control works) and various utilities (e.g. pipelines) subject to the activity being approved through a satisfactory Environmental Assessment process (if required);

c) stream bank, slope and valley stabilization to protect existing development or for conservation or restoration projects subject to the activity being approved through a satisfactory Environmental Assessment process (if required);

d) minor removal of fill or placement of fill or site grading, as specified in 5.1.d) and subject to policies 8.2.1.

8.2.2.1 Access through the Erosion Hazard

(i) Development associated with the construction of a driveway or access way through the erosion hazard of an apparent river or stream valley in order to provide access to lands outside of the apparent river or stream valley, may be permitted where:

a) it has demonstrated that there is no viable alternative outside of the regulated area; and

b) the provisions for safe access as identified in Appendix B have been met.

8.2.2.2 Development Associated With Existing Uses

(i) Development associated with existing uses located within the meander belt, such minor additions, non-habitable accessory buildings, pools, landscaping retaining walls, grading, decks, etc., may be permitted where it has been demonstrated to the satisfaction of the Conservation Authority that:

a) there is no feasible alternative site outside of the meander belt and the proposed development is located in an area of least (and acceptable) risk;

b) the development will not prevent access into and through the meander belt in order to undertake preventative actions/maintenance or during an emergency;

c) the development will have no negative impacts on natural stream meandering/fluvial processes;

d) the potential for surficial erosion has been addressed through the submission of proper drainage, erosion and sediment control and site stabilization/restoration plans;

e) natural features and/or ecological functions contributing to the conservation of land are protected, pollution is prevented and flooding hazards have been adequately addressed;

f) non-habitable structural development would not be susceptible to stream erosion; and

g) minor additions to habitable structures would not be susceptible to stream erosion within the 100 year planning horizon.

8.2.2.3 Reconstruction/Relocation of a Building

(i) Development may be permitted for the reconstruction or relocation of a building within the meander belt provided that it has not been damaged or destroyed by erosion and if it has been demonstrated to the satisfaction of the Conservation Authority that the building:

a) cannot be relocated to an area outside the erosion hazard and if there is no feasible alternative site, that it is located in an area of least (and acceptable) risk; and

b) will be protected from the erosion hazard through incorporation of appropriate building design parameters; and

c) will not exceed original habitable floor area or the original footprint area of the previous structure.

9.0 Wetland Policies

Wetlands have hydrologic, ecosystem and human benefits:

(i) From a hydrologic function perspective, wetlands retain water during the spring freshet and storm events, allowing water to slowly release into watercourses, infiltrate into the ground, and to evaporate.
(ii) When located within the flood plain of a watercourse, wetlands also reduce the energy of moving water including boat wakes, and mitigate associated shoreline erosion.
(iii) From an ecosystem perspective, wetlands sustain biodiversity by providing wildlife habitat including for species at risk, and support maintenance of natural cycles (carbon, water, nitrogen) and food chains.
(iv) From a human perspective, wetlands provide social and economic value including flood attenuation, improvement of water quality, recharge of ground water supplies, support for fishing and other recreational activities, production of valuable products (e.g. wild rice), and educational opportunities.

Section 9 policies address three types of areas: wetlands, other/adjacent land, and provincially significant wetlands.

Wetlands are defined in Section 28(25) of the *Conservation Authorities Act*. That definition is repeated verbatim in the Appendix A of this document and forms part of the MVCA policy. MVCA regulates all wetlands greater than 0.5 ha in size that have hydraulic connectivity.

Other land abutting or linked hydrologically to wetlands play an important role in maintaining the integrity of wetlands. For this reason, provincial laws, regulations, and policy statements and MVCA policies provide for the regulation of buffer areas to protect the hydrologic, ecological and human functions of a wetland. MVCA regulates land lying within 120 meters of a provincially significant wetland and within 30 meters of all other regulated wetlands.

Provincially significant wetlands are a subset of wetlands that have been evaluated by the Ministry of Natural Resources and Forestry (MNRF) using the *Ontario Wetland Evaluation System* (OWES) and found to exceed a specific score. The evaluation system provides a standard approach, methodology and scoring system, and is the basis for designating PSWs, and regulating them under *Ontario Regulation 153/06*.

Most wetlands within the watershed have not been evaluated due to financial constraints. Of those that have been evaluated and deemed provincially significant, not all are identified in municipal planning documents. O.Reg. 153/06 and MVCA PSW policies apply regardless of whether a PSW is identified in municipal planning documents. MVCA applies PSW policies to land that:

(i) has been evaluated using the OWES; and
(ii) achieves an OWES score indicating provincial significance; and
(iii) meets the *CA Act* definition of a wetland.

9.1 Application

The *Conservation Authorities Act*, O.Reg 153/06 and Section 9 policies apply to the development and interference of wetlands as illustrated in Figure 4. Where additional hazards exist on a site such as flood hazards or unstable soil or slope hazards, other applicable policies of this document shall also be addressed.

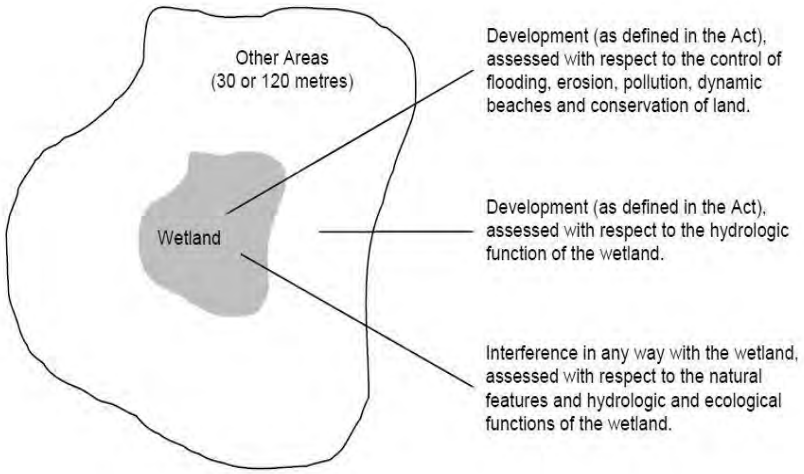


Figure 4. Three ways in which wetlands and other areas are regulated

9.2 PSW – Boundaries

Wetland boundaries have been established by and are maintained by the Ministry of Natural Resources and Forestry (MNRF) based on the Ontario Wetland Evaluation System (OWES). Data is held within the provincial Land Inventory Ontario database. Should the precise location of a PSW boundary be contested, the PSW must be evaluated by a qualified professional trained in application of the OWES to delinate the PSW boundary. Where a wetland boundary identified on-site differs from the approved MNRF boundary, the proponent is responsible for submitting information and obtaining acceptance of the new wetland boundary from the MNRF.

Ontario Regulation 153/06 and Section 9 policies apply to a PSW effective the date that the PSW boundary is approved by the MNRF.

9.3 PSW – Permitted Uses

I. Development and site alteration shall not be permitted in Provincially Significant Wetlands.
II. No person shall change or interfere in any way with a PSW without a valid permit from the MVCA.
III. New stormwater management facilities shall not be permitted within Provincially Significant Wetlands.

IV. Except as may be permitted elsewhere in this section, new ponds, new drains and peat extraction shall not be permitted within Provincially Significant Wetlands.

V. Notwithstanding Section 9.3.1., public infrastructure (e.g. roads, sewers, flood and erosion control works) and various utilities (e.g. pipelines) may be permitted within Provincially Significant Wetlands provided that:

(i) There is a satisfactory completion of an Environmental Assessment under the *Environmental Assessment Act*; and

(ii) Alternative locations have been evaluated to the satisfaction of the MVCA, and it has been determined that there is no reasonable location for the infrastructure outside of the wetland; and

(iii) The interference with natural features and the hydrologic and ecological functions of the Provincially Significant Wetland is deemed as acceptable by MVCA; and

(iv) It has been demonstrated that the control of flooding, erosion, pollution or the conservation of land will not be affected, to the satisfaction of the MVCA.

VI. Notwithstanding Section 9.3.1 the following activities may be permitted within Provincially Significant Wetlands provided it has been demonstrated to the satisfaction of the MVCA that the control of flooding, erosion, pollution or the conservation of land will not be affected, and the interference on the natural features and hydrologic and ecological functions of the Provincially Significant Wetland have been deemed to be acceptable by the MVCA. Permitted activities include:

(i) Conservation and restoration projects;

(ii) Development associated with public parks (e.g. passive or low intensity outdoor recreation and education, trail system);

(iii) Flood and erosion control works adjacent to lacustrine or riverine wetlands that are proposed to protect private land, where alternate approaches such as stewardship activities (including intensive naturalization of the riparian zone) are not feasible;

(iv) Repair, renovation or maintenance of existing marine facilities;

(v) Maintenance of an existing public or private road;

(vi) Replacement, reconstruction or minor additions to existing structures subject to satisfaction of the following factors:

a) the viability of relocating the structure outside the wetland boundary is evaluated and determined to be unfeasible ; and

b) any expected hydrological impacts can be mitigated ; and
c) any expected ecological impacts can be *mitigated*.

Completion of an Environmental Impact Study (EIS) of a scope appropriate to the nature of the feature and the scale of the project may, however, be required at the Authority's discretion to the satisfaction of the MVCA, to identify mitigation and enhancement opportunities. See the Appendices to this document for information on the content and approach of an EIS or HIS.

Existing agricultural activities within the wetland boundary

Nothing in this policy is intended to limit the ability of existing agricultural uses to continue. No new agricultural activity, buildings, or structures are permitted within a Provincially Significant Wetland.

9.3.1 Drainage Works

New drainage works within a provincially significant wetland are not permitted. Repair and/or maintenance to existing drainage works under the *Drainage Act* may be permitted provided the work results in the restoration of the drain to the specifications described in the approved Engineers Report for that drain.

9.3.2 Access

Constructed access through a PSW may be permitted for a Lot of Record provided that:

(i) The parcel and the proposed access have frontage on an opened road allowance.

(ii) The proposed development is on the same parcel as the regulated feature.

(iii) The proposed development meets municipal zoning requirments and all other requirements of this document.

(iv) There is no other compliant route available to access the developable area of the parcel from the opened road allowance.

(v) The proposed alignment minimizes encroachment into the regulated area to the greatest extent possible.

(vi) The control of flooding, erosion, pollution, or the conservation of land will not be affected;

(vii) The interference of the natural features and hydrologic and ecological functions of the wetland have been determined to have no negative impact through the submission of the

appropriate studies (e.g. Environmental Impact Study, geotechnical study, hydrogeological study) prepared to the satisfaction of the MVCA; and

(viii) A mitigation plan is prepared to the satisfaction of the MVCA to compensate for the loss of wetland features and function.

(ix) A compensation/offsetting agreement is executed, where appropriate.

9.3.3 Boardwalks

Development of boardwalks (e.g. narrow, raised planked trails) may be permitted within a PSW where:

(i) The control of flooding, erosion, pollution or the conservation of land will not be affected; and
(ii) Any interference on the natural features and hydrologic and ecological functions of the wetland are deemed acceptable.

MVCA alone will determine whether conditions 9.3.9 (i) and (ii) are met through review of an Environmental Impact Study (EIS) submitted by the applicant in accordance with Appendix F. The EIS shall also demonstrate that the proposed boardwalk will be:

(i) Above the applicable flood elevation; and
(ii) No greater than 1.5 metres wide; and
(iii) Constructed with materials that will not leach hazardous substances to the natural environment; and
(iv) The design and construction method should minimize the development footprint in the wetland.

In water and near shore works may be prohibited at certain times of year to prevent interference with spawning, hatching and rearing of young fish. These restrictions may vary according to the identified nature of the fishery (e.g. cold and warm water).

9.4 Development within Other Areas adjacent to wetlands

The following policies apply to other areas adjacent to wetlands identified as being within 120 metres from the boundary of Provincially Significant Wetlands. In these areas, development will be evaluated with a view to its expected effects on interference with the hydrologic function of the wetland.

9.4.1 Area Within 30 Metres of the *Provincially Significant Wetland*

I. Development shall not be permitted within 30 metres of the boundary of a Provincially Significant Wetland.

II. Notwithstanding Section 9.4.1., the following developments may be permitted within 30 metres of a Provincially Significant Wetland if the interference with the hydrologic functions of the wetland has been deemed to be acceptable by the MVCA**:**

(i) Development associated with public parks (including, for instance, passive or low intensity outdoor recreation and education, trail system);

(ii) A marine facility;

(iii) Stormwater outlets;

(iv) Public infrastructure (e.g. roads, sewers, flood and erosion control works and various utilities (e.g. pipelines) that is supported by an appropriate Environmental Assessment or a Comprehensive Environmental Impact Study which demonstrates that there will be no adverse effect on the hydrologic function of the wetland to the satisfaction of the MVCA.

III. Notwithstanding Section 9.4.1., the following additional developments may also be permitted within 30 metres of a Provincially Significant Wetland if the interference with the hydrologic functions of the wetland has been deemed to be acceptable by MVCA. Best Management Practices as prescribed by MVCA shall be implemented to address expected interference with the hydrologic function of the wetland. The completion of an HIS with a scope appropriate to the nature of the feature and the scale of the proposed development may be required as per Appendix F. Development activities include:

(i) Development of a single detached dwelling and/or related auxiliary structure and associated grading activity on an existing vacant lot of record with insufficient lot depth to accommodate a setback greater than 30 metres and no alternative location options exist;

(ii) Repairs, reconstruction and/or one-time minor additions to existing buildings and structures;

(iii) Replacement or construction of a new sewage system in accordance with Part 8 of the OBC; tertiary treatment systems may be required to minimize site disturbance as well as adverse effects on the hydrologic function of the wetland);

(iv) Maintenance of existing public or private access roads;

(v) Maintenance of existing conservation or wetland restoration projects;

(vi) A one-time development involving fill (not to exceed 100 m^3) or minor site grading / landscaping activities associated with an existing use.

IV. Existing agricultural activities within 30 metres of the boundary of a provincially significant wetland. These policies are not intended to limit the ability of existing agricultural activities to continue.

V. Where, in the opinion of the MVCA, measures beyond standard Best Management Practices will unlikely mitigate expected impacts, the completion of an HIS with a scope appropriate to the nature of the feature and the scale of the proposed development shall be required as per Appendix F.

9.4.2 Areas between 30 and 120 Metres of a *Provincially Significant Wetland*

1. Development may be permitted in the area between 30 and 120 metres of a provincially significant wetland, if the interference with the hydrologic functions of the wetland has been deemed to be acceptable by MVCA. Best Management Practices as prescribed by MVCA shall be implemented to address expected interference with the hydrologic function of the wetland. The completion of an HIS with a scope appropriate to the nature of the feature and the scale of the proposed development may be required as per Appendix F.

2. Where no feasible alternatives exist, the following typical developments may be permitted in the area between 30 and 120 metres of a provincially significant wetland where Best Management Practices acceptable to MVCA are used to mitigate potential impacts to the hydrologic function of the wetland feature. Representative activities include:

(i) New single detached residential dwelling and associated small accessory buildings;

(ii) Repairs, reconstruction and/or one-time minor additions to existing buildings and structures;

(iii) New accessory structures to an existing single detached residential dwelling including deck, shed, swimming pool;

(iv) Replacement or construction of a new sewage system in accordance with Part 8 of the OBC; where no other alternative sewage envelope exists on the property;

(v) Maintenance of existing public or private access roads;

(vi) Maintenance of existing conservation or wetland restoration projects;

(vii) A one-time development involving fill (not to exceed 100 m^3) or minor site grading / landscaping activities associated with an existing use;

(viii) A new agriculture building/structure or expansions to existing facilities where the gross floor area of the building is equal to or less than 500 m^2 (5382 ft^2) in size;

(ix) Public infrastructure (e.g. roads, sewers, flood and erosion control works and various utilities (e.g. pipelines) that is supported by an appropriate Environmental Assessment or a Comprehensive EIS and impacts to the hydrologic function of the wetland feature are to be appropriately addressed.

3. Existing agricultural activities in the area between 30 and 120 metres of a provincially significant wetland. These policies are not intended to limit the ability of existing agricultural activities to continue.

4. Where, in the opinion of the MVCA, measures beyond standard Best Management Practices are required to mitigate expected impacts, the completion of an HIS with a scope appropriate to the nature of the feature and the scale of the proposed development shall be required as per Appendix F**.**

9.5 Other Regulated Wetlands

Section 9.5 applies to wetlands that:

(i) Are greater than 0.5 ha (1.2 acres) in size; and
(ii) Have hydraulic connectivity to a waterbody/watercourse, and;
(iii) Meet the definition of a wetland under Section 28 (25) of the *Conservation Authorities Act.*

MVCA has maps that delineate known and potentially regulated wetlands. Wetland boundaries are approximate and subject to on-the-ground confirmation. Maps are updated as resources allow and are intended for reference use only. It is the responsibility of landowners to determine whether their property contains a wetland that is subject to regulation.

9.5.1 Permitted Uses

1) **No development** shall occur within a wetland that impacts the control of flooding, erosion, pollution or the conservation of land.

2) No person shall change or interfere in any way with a wetland without a **valid permit** from the MVCA.

3) **New ponds and drainage works** within other wetlands may be considered where it is demonstrated that the wetland is not provincially significant and that the pond and drainage work will not cause adverse effects on the ecological or hydrologic function of the feature.

4) Repair and/or maintenance to **existing drainage works** under the *Drainage Act* may be permitted provided the work results in the restoration of the drain to the specifications described in the approved Engineers Report for that drain.

5) Excavation of **existing ponds** within a wetland is permitted subject to the appropriate flood plain hazard policies and provided: the dredging does not have an adverse impact on the wetland feature and function, all dredging material is placed at a suitable distance from the wetland, and the interference on the natural features and hydrologic and ecological functions of the *wetland* has been deemed to be acceptable by the MVCA;

6) In general, **stormwater management facilities** shall not be permitted within wetlands;

7) Notwithstanding Section 9.5.1 1), **public infrastructure** (e.g. roads, sewers, flood and erosion control works) and various utilities (e.g. pipelines) is permitted within a wetland if it has been demonstrated to the satisfaction of the MVCA that the control of flooding, erosion, pollution, or the conservation of land will not be affected and the interference on the natural features and hydrologic and ecological functions of the wetland has been deemed to be acceptable by the MVCA;

8) Notwithstanding Section 9.5.1 1), ***erosion* control works** and conservation or restoration projects is permitted within a wetland if it has been demonstrated to the satisfaction of the MVCA that the control of flooding, erosion, pollution, or the conservation of land will not be affected and the interference on the natural features and hydrologic and ecological functions of the wetland has been deemed to be acceptable by the MVCA;

9) Notwithstanding Section 9.5.1 1), development associated with **public parks** (e.g. passive or low intensity outdoor recreation and education, trail system) is permitted within a wetland if it has been demonstrated to the satisfaction of the MVCA that the control of flooding, erosion, pollution, or the conservation of land will not be affected and the interference on the natural features and hydrologic and ecological functions of the wetland has been deemed to be acceptable by the MVCA;

10) Reconstruction of **existing structures** is permitted provided the replacement structure is reconstructed to its original footprint or smaller and there is no feasible alternative location on the subject lot outside of the wetland.

11) A single dwelling and accessory building are permitted on an **existing vacant lot** of record within a wetland provided:
    (i) The use, erection and location is permitted by the applicable municipal zoning by-law;
    (ii) There is no alternative location for the dwelling on the subject lot outside of the wetland;

(iii) Hazards related to organic soils can be addressed; and

(iv) The applicant demonstrates, to the extent possible, that the development will not adversely affect the wetland feature and functions. An Environmental Impact Statement will be required to assess the ecology of the wetland and identify mitigation measures and best efforts to minimize impacts. If best efforts are not demonstrated to the satisfaction of MVCA, a permit may not be issued.

12) Development of **boardwalks** (e.g. narrow, raised planked trails) may be permitted within a regulated wetland where:

(i) the control of flooding, erosion, pollution or the conservation of land will not be affected; and

(ii) any interference on the natural features and hydrologic and ecological functions of the wetland are deemed acceptable.

MVCA alone will determine whether conditions a) and b) are met through review of an Environmental Impact Study (EIS) submitted by the applicant in accordance with Appendix F. The EIS shall also demonstrate that the proposed boardwalk will be:

(i) above the applicable flood elevation; and

(ii) no greater than 1.5 metres wide; and

(iii) constructed with materials that will not leach hazardous substances to the natural environment.

In water and near shore works may be prohibited at certain times of year to prevent interference with spawning, hatching and rearing of young fish. These restrictions may vary according to the identified nature of the fishery (e.g. cold and warm water).

13) Constructed **access** through a regulated area may be permitted for a Lot of Record provided that:

(i) The parcel and the proposed access have frontage on an opened road allowance.

(ii) The proposed development is on the same parcel as the regulated feature.

(iii) The proposed development meets municipal zoning requirments and all other requirements of this document.

(iv) There is no other compliant route available to access the developable area of the parcel from the opened road allowance.

(v) The proposed alignment minimizes encroachment into the regulated area to the greatest extent possible.

(vi) The control of flooding, erosion, pollution, or the conservation of land will not be affected;

(vii) The interference of the natural features and hydrologic and ecological functions of the wetland have been determined to have no negative impact through the submission of the appropriate studies (e.g. Environmental Impact Study, geotechnical study, hydrogeological study) prepared to the satisfaction of the MVCA; and

(viii) A mitigation plan is prepared to the satisfaction of the MVCA to compensate for the loss of wetland features and function.

(ix) A compensation/offsetting agreement is executed, where appropriate.

14) Land uses with **existing *Planning Act* approvals** as of adoption of this policy are permitted. Notwithstanding Section 9.5.1 1), work associated with the following is permitted:

a) Works approved through existing an Municipal Class Environmental Assessment
b) Activities on Crown Land
c) Existing agricultural uses
d) Selective tree harvesting for private use
e) Accessory buildings under 10 m^2

9.*5.2* Areas within 30 Metres of a *Wetland*

1) In general, development shall not be permitted within 30 metres of the boundary of a wetland;

2) Notwithstanding Section 9.5.2 1), public infrastructure (e.g. roads, sewers, flood and *erosion* control works) and various utilities (e.g. pipelines) is permitted within 30 metres of a wetland if the interference on the hydrologic functions of the wetland has been deemed to be acceptable by the MVCA;

3) Notwithstanding Section 9.5.2 1), conservation or restoration projects are permitted within 30 metres of a wetland if the interference on the hydrologic functions of the wetland has been deemed to be acceptable by the MVCA;

4) Notwithstanding Section 9.5.2 1), development associated with public parks (e.g. passive or low intensity outdoor recreation and education, trail system) is permitted within 30 metres of a wetland if the interference on the hydrologic functions of the wetland has been deemed to be acceptable by the MVCA;

5) A single dwelling on an existing vacant lot of record, minor additions to existing buildings/structures, accessory building/structures (less than 50 m^2), and reconstruction of existing buildings are permitted provided it has been demonstrated to the satisfaction of MVCA that:

(i) all development (including grading) is located outside the wetland and maintains as much buffer as feasible;
(ii) a minimum vegetated buffer of 15 metres from the wetlands is established;
(iii) disturbances to natural vegetation communities contributing to the hydrologic function of the wetland are avoided;
(iv) the overall existing drainage patterns will be maintained;
(v) disturbed area and soil compaction is minimized;
(vi) where appropriate, development is located above the high water table;
(vii) all septic systems are located a minimum of 15 metres from the wetland and a minimum of 0.9 metres above the water table;
(viii) impervious areas are minimized;
(ix) best management practices are used to:
    i. Maintain water balance
    ii. Control sediment and erosion
    iii. Buffer wetlands
    iv. Limit impact of development on wildlife species

6) Notwithstanding Section 9.5.2 1), development associated with the importation of fill for the construction of a private access road, associated filling and lot grading is permitted within 30 metres of a wetland on a constrained lot if the interference on the hydrologic functions of the wetland has been deemed to be acceptable by the MVCA, the development does not affect the control of flooding, and MVCA floodproofing guidelines and access standards can be achieved. A technical study is requested to assess the hydrologic impact.

7) Notwithstanding Section 9.5.2 1), structural repairs to an existing building or structure is permitted within 30 metres of a wetland if the interference on the hydrologic functions of the wetland has been deemed to be acceptable by the MVCA;

8) Notwithstanding Section 9.5.2 1), development is permitted within 30 metres of a wetland if the proposed development does not encroach further into the setback from the wetland boundary than existing development and if the interference on the hydrologic functions of the wetland has been deemed to be acceptable by the MVCA;

9) In instances where there are two or more natural hazards associated with a development proposal, the greater setback allowance will be applied.

9.6 Compensation and Offsetting

Where a land use is permitted per Sections 9.3.4 and 9.3.5 or a Ministerial Zoning Order (MZO), or where appropriate, MVCA may require compensation or offsetting to address matters related

to the control of flooding, erosion, pollution and the conservation of land. The type and scale of compensation/ offsetting required shall be based upon the following:

(i) the ecological and hydrologic characteristics and the significance of the regulated area affected; and
(ii) the characteristics of the proposed land use; and
(iii) the scale, proximity to, and severity of the impacts on the regulated area.

Applicants shall follow the impact assessment procedures contained in the Appendices in order to allow MVCA to determine appropriate compensation and offsetting requirements.
All costs incurred by MVCA for the negotiation, drafting, review, and registration of compensation and offsetting agreements shall be born by the applicant. Approval by the MVCA Board of Directors may be required before entering into such an agreement.

10.0 Alterations to Shorelines and Watercourses

Alterations to shorelines and watercourses activities include altering, straightening, changing, diverting or interfering, in any way, with the channel of any watercourse within the watershed. This may also include shoreline rehabilitation and erosion control on lakes.

The Authority supports the application of "Natural Channel Design" principles in all proposals, public or private, in recognition of the environmental, human health, economic and aesthetic benefits of the approach. Where opportunities exist to restore, enhance or re-establish natural conditions those opportunities should be utilized as maintaining healthy and functional channel processes will serve to minimize the need for future restoration and mitigation.

The Authority's review of riverfront protection / improvement applications will be conducted in cooperation with the appropriate District / Area Office of the Ontario Ministry of Natural Resources and Forestry. The Authority will consult with the Ministry of Natural Resources and Forestry, the Department of Fisheries and Oceans (Canada) or other partners where proposed work may interfere with fish habitat.

10.1 General Policies

(i) Shoreline hardening techniques such as the use of concrete, steel, railway ties, gabion baskets, armour stone (cap rock, limestone blocks) and other vertical structures will generally not be permitted.

(ii) The design of projects involving shoreline alterations where natural heritage features such as Areas of Natural or Scientific Interest (ANSI) and shoreline wetlands may be present, will be required to take into consideration the ecological functions of the watercourse while allowing for compatible development.

(iii) In water or near shore works may be prohibited at certain times to prevent interference with spawning, hatching and rearing of young fish. Timing restrictions may vary according to the identified nature of the fishery (cold and warm water).

(iv) Base flows must not be adversely affected by any work.

(v) All surplus excavated material must be immediately removed from the flood plain to an approved area outside of all regulatory limits (wetlands, erosion hazards) and at a minimum of 30 metres from the waterbody.

(vi) Erosion and sediment control measures are to be in place before and during construction and until the site is permanently stabilized. This will include, where applicable, the use and maintenance of check dams, silt screens, sediment ponds, buffer strips or other effective measures.

(vii) It is the responsibility of the landowner/applicant to provide any studies or reports necessary for the Authority's review and evaluation of the proposal.

(viii) The Authority may waive any requirements where there will clearly be no detrimental effects on the control of flooding, erosion, pollution or the conservation of land.

10.2 Alterations to Shorelines

Shorelines are the interface where land meets a body of water. Shorelines are dynamic in nature and are subject to fluvial and coastal processes. They act as a natural water quality filter for surface runoff and often absorb certain nutrients and contaminants, as well as trap sediment.

Naturalized shorelines with an abundance of vegetation provide erosion protection by assisting with the mitigation of surface runoff. Plant and tree root systems also bind the soil in place preventing further erosion of earthen material that is often lost due to natural processes such as wave action or changes in water level.

1) In general, alterations to a shoreline shall not be permitted.

2) In general, shoreline hardening will not be permitted unless there is active erosion occurring along a shoreline or watercourse and the site is not suitable for bio-engineering or the re-establishing of natural conditions are not feasible options.

3) Notwithstanding Section 10.2 2), where natural conditions cannot be re-established due to active erosion or site-specific constraints, shoreline alteration proposals may be permitted provided that:
   (i) upstream water levels (backwater effects) will not be increased;
   (ii) alignment will not affect river hydraulics or base flows;
   (iii) proposed protection will not alter local erosion, debris accumulation or undesirable changes in local currents or sediment transport nor impact abutting shoreline properties.
   (iv) where the shoreline is in the vicinity of marginally stable or unstable slope, professional geotechnical engineering input may be required at the Authority's discretion and at the landowner/applicant's expense; and
   (v) the shoreline alterations are constructed in accordance with Appendix G.

4) Notwithstanding Section 10.2 1) & 2), an alteration to a shoreline or development that by its nature is located along the shoreline such as the construction or reconstruction of a marine facility and erosion control measures may be permitted if it has been demonstrated to the satisfaction of the MVCA that the control of flooding, erosion, pollution, dynamic beaches or the conservation of land will not be adversely affected. The MVCA may request a technical study to ensure that the development is not subject to unacceptable risk. The submitted plans must demonstrate that:

(i) the potential for surficial erosion has been considered and addressed;
(ii) impacts of ice force on the development have been considered and addressed;
(iii) wave uprush impacts have been considered and addressed;
(iv) structures and erosion control measures meet requirements under Appendix G.

5) Notwithstanding Section 10.2 1), dredging may be permitted along the shoreline if it has been demonstrated to the satisfaction of the MVCA that the interference will not be adversely affect the natural features and hydrologic and ecological functions of the *watercourse* and the control of flooding, erosion, pollution, dynamic beaches or the conservation of land. The submitted plans must demonstrate that:
(i) all dredged material is removed from the waterbody and placed in an upland area (i.e., outside of the regulatory flood plain and/or a minimum of 30 metres from the watercourse);
(ii) the dredged material is transported in a contained fashion; and
(iii) Appropriate *erosion* and sediment control measures are implemented.

10.3 Channel Realignments, Road Crossings, Diversions Dams

(i) Projects such as channelization, bridges, culverts, dams, dykes, weirs, outlet structures, etc. and shoreline works associated with stormwater treatment facilities and other related activities will require a design prepared by a Professional Engineer, at the landowner/applicant's expense, addressing the hydrotechnical aspects of the proposal including backwater effects and upstream water levels, local streamflow velocities and erosion protection measures, and implications for lost channel and / or flood plain storage volume.

(ii) It is advised that projects should be designed to incorporate "Natural Channel Design" features as much as possible including the creation of pools, riffles, gravel beds, and natural stream meanders. In this regard, professional ecological services may have to be retained by the proponent to ensure that the appropriate measures are incorporated into the design.

Appendix A: Definitions

Agricultural uses: means the growing of crops, including nursery and horticultural crops; raising of livestock; raising of other animals for food, fur or fibre, including poultry and fish; aquaculture; apiaries; agro-forestry; maple syrup production; and associated on-farm buildings and structures.

Agriculture-related uses: means those farm-related commercial and farm-related industrial uses that are small scale and directly related to the farm operation and are required in close proximity to the farm operation.

Alternative energy systems: means sources of energy or energy conversion processes that significantly reduce the amount of harmful emissions to the environment (air, earth and water) when compared to conventional energy systems.

Apparent valley: are those where the watercourse is located within a valley corridor, either with or without a flood plain, and is confined by valley walls. The watercourse may be located at the toe of the valley slope, in close proximity to the toe of the valley slope (less than 15m) or removed from the toe of the valley slope (more than 15 m). The watercourse can contain perennial, intermittent or ephemeral flows and may range in channel configuration, from seepage and natural springs to detectable channels. A river or stream valley is apparent if

- the slope is 3 metres or greater in height and
- the slope is 5 :1 or steeper

Area of interference: means those lands where development could interfere with the hydrologic function of a wetland.

Areas of natural and scientific interest (ANSI): means areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education.

Basement: The area of a dwelling located below the main floor habitable space that is equal or greater than 1.8 metres in height measured from the lowest point of the main floor assembly (underside of floor joist) to the ground or other surface below and is used for any occupancy.

Bank: means any steep acclivity, whether rising from a river, a lake or the sea, or forming the side of a ravine, or the steep side of a hillock on a plain. When we speak of the earth in general adjoining a lake or the sea, we use the word shore; but a particular steep acclivity on the side of a lake, river, or the sea, is called a bank. *The Imperial Dictionary* (1854), vol. 1, p. 154

Best management practice (BMPs): design, construction, and maintenance practices and criteria that can minimize the impact of a project on the hydrology and/or ecology within the Regulated area.

For wetlands a combination of site specific mitigation measures intended to reduce the effect of a development on the hydrologic function of a wetland. Such measures typically include building

site selection, limitations on fill, drainage management and the preservation and augmentation of vegetation on site to ensure that post development site conditions closely emulate the pre-development condition with no adverse hydrologic effects.

Boathouse: an accessory *building* that does not contain habitable living space; has an opening to the waterbody of an appropriate size to accommodate a boat; and is connected to the waterbody by a boat slip, boat lift, or marine railway. Any component of the boathouse that is in contact with the waterbody at any time of the year must consist of untreated material (e.g. cedar, tamarack, hemlock, rocks, plastic, etc.). Treated lumber may contain compounds that can be released into the water and become toxic to the aquatic environment.

Building: The Building Code Act (Ontario) defines a building as:

a) a structure occupying an area greater than ten square metres consisting of a wall, roof and floor or any of them or a structural system serving the function thereof including all plumbing, works, fixtures and service systems appurtenant thereto;

b) a structure occupying an area of ten square metres or less that contains plumbing, including the plumbing appurtenant thereto;

c) plumbing not located in a structure;

(c.1) a sewage system; or

d) structures designated in the building code; ("bâtiment").

Buffer: An area or band of permanent vegetation, preferably consisting of native species, located adjacent to a natural heritage feature and usually bordering lands that are subject to development or site alteration. The purpose of the buffer is to protect the feature and its functions by mitigating impacts of the proposed land use and allowing an area for edge phenomena to continue. The buffer may also provide area for recreational trails and provides a physical separation from new development that will discourage encroachment. (Adapted from a definition in Fisher and Fischenich, 2000, citing Castelle et al., 1994 in Natural Heritage Reference Manual, MNR 2010)

Carport: A roofed enclosure used for the storage or parking of motor vehicles with a maximum 40 per cent of the total perimeter enclosed by walls, doors or windows. A minimum of 60 per cent must remain unenclosed in the form of full or half open walls.

Conservation of Land: For purposes of this document means the protection, management, or restoration of lands within the watershed ecosystem for the purpose of maintaining or enhancing the natural features and hydrologic and ecological functions within the watershed.

Conservation activities: means projects intended to maintain, enhance, or restore the functions of a wetland, or to create a wetland where one did not exist previously. Projects and activities

can include for example: plantings, wetland creation or alteration, landscaping, grading, hydrologic manipulation, and invasive species removal.

Conservation projects: means projects intended to maintain, enhance or restore the functions of a wetland, or to create a wetland where one did not exist previously. Projects and activities can include, for example: plantings, wetland creation or alteration, landscaping, grading, hydrologic manipulation, and invasive species removal.

Crawlspace: The area of a dwelling that is less than 1.8 metres in height measured from the lowest part of the main floor assembly (underside of floor joist) and the ground or other surface below

Cumulative effects assessment: cumulative effects represent the sum of all individual effects occurring over space and time, including those that will occur in the foreseeable future (Natural Heritage Reference Manual). An assessment includes consideration for the incremental effects of an action on the environment when the effects are combined with those from other past, existing and future actions (Cumulative Effects Assessment Practitioners Guide, Hegmann *et al.* 1999).

Development:

a) the construction, reconstruction, erection or placing of a building or structure of any kind;

b) any change to a building or structure that would have the effect of altering the use or potential use of the building or structure, increasing the size of the building or structure or increasing the number of dwelling units in the building or structure;

c) site grading; or

d) the temporary or permanent placing, dumping or removal of any material, originating on the site or elsewhere (S. 28 (25) CA Act of Ontario).

Detached: to be considered detached is a structure must be located at least 1.5 metres from the main building

"Development, Interference with Wetlands and Alterations to Shorelines and Watercourses" regulation: A regulatory authority under Section 28 of the *Conservation Authorities Act* of Ontario related to activities on hazard lands, in wetlands or along watercourses as defined. Replaced the "**Fill, Construction and Alteration to Waterways"** regulation.

Dry floodproofing: the object of dry floodproofing is to keep a development and its contents completely dry during flood events. Dry, passive floodproofing includes the use of fill, columns or design modification to elevate openings in the structure above the level of the regulatory flood so that there is no need for action to put the flood protection into effect. Dry, active floodproofing

requires some action to keep the development dry during flood events by use of water tight doors and seals or sandbagging to prevent water from entering openings below the regulatory flood elevation. Dry floodproofing of structures that will have portions below the level of the regulatory flood requires additional special design attention so that the structure will resist all loads including hydrostatic pressures.

Dwelling unit: means one or more habitable rooms, occupied or capable of being occupied as an independent and separate housekeeping establishment, in which separate kitchen and sanitary facilities are provided for the exclusive use of the occupants.

Ecological function: means the natural processes, products or services that living and non-living environments provide or perform within or between species, ecosystems and landscapes. These may include biological, physical and socio-economic interactions.

Environmental Impact Study: means a document produced by a qualified professional usually to a prescribed standard that examines the environmental consequences of a development project.

Erosion: means a continual loss of earth material (i.e. soil) over time as a result of the influence of water or wind.

Fill: means any material capable of being used to raise, lower, or in any way affect the contours of the ground.

Fill Material: Clean material that when buried will have no adverse effect on people or the environment. Includes natural materials such as clay, soil, and rock, and other inert materials such as concrete or brick that are free of combustible, putrescible, degradable or leachable components. Fill material must not be susceptible to washout, scour, or erosion of any kind, must be placed to ensure the long term stability of slopes in accordance with sound engineering standards and be composed of inert material.

Flood fringe: the outer portion of the flood plain between the floodway and the regulatory flood. Flood depths are generally less severe in the flood fringe than those experienced in the floodway

Floodproofing: means a combination of structural changes and/or adjustments incorporated into the basic design and/or construction or alteration of individual buildings, structure or properties subject to flooding so as to reduce or eliminate flood damages and to provide for the continued occupancy of the structure throughout a flood event of the regulatory flood magnitude

Floodway: the channel of a watercourse and that inner portion of the flood plain where flood depths and velocities are generally higher than those experienced in the flood fringe. The floodway represents that area required for safe passage of flood flows and/or velocities are considered such that they pose a potential threat to life and/or property damage

Ground water feature: refers to water-related features in the earth's subsurface, including recharge/discharge areas, water tables, aquifers and unsaturated zones that can be defined by surface and subsurface hydrogeologic investigations.

Gross floor area: The total area of each floor with headroom height of 1.8 metres or greater, whether located above, at or below grade, measured from the interior of outside walls and including floor area occupied by interior walls and floor area created by bay windows.

Habitable: means room or space required and intended for overnight occupancy, and includes facilities for storage, heating, air-conditioning, electrical, hot water supply, plumbing, waste connections, etc. which are necessary to maintain the habitable condition.

Hazardous sites: means property or lands that could be unsafe for development and site alteration due to naturally occurring hazards. These may include unstable soils (sensitive marine clays [leda], organic soils) or unstable bedrock (karst topography).

Hazardous substances: means substances which individually, or in combination with other substances, are normally considered to pose a danger to public health, safety and the environment. These substances generally include a wide range of materials that are toxic, ignitable, corrosive, reactive, radioactive or pathological.

Hydrologic Function: the functions of the hydrological cycle that include the occurrence, circulation, distribution and chemical and physical properties of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere, and water's interaction with the environment including its relation to living things.

Hydrologic Impact Study (HIS): a site specific study produced by a qualified professional or group of professionals, usually to a prescribed standard, that examines the hydrologic consequences of a development project (see Appendix F).

Hydroperiod: means the period of time for which a given area has standing water, or water at surface.

Individual on-site sewage services: means individual, autonomous sewage disposal systems within the meaning of s.8.1.2, O.Reg. 403/97, under the *Building Code Act*, 1992 that are owned, operated and managed by the owner of the property upon which the system is located.

Individual on-site water services: means individual, autonomous water supply systems that are owned, operated and managed by the owner of the property upon which the system is located.

Interference in any way: any anthropogenic act or instance which hinders, disrupts, degrades or impedes in any way the natural features or hydrologic and ecologic functions of a wetland or watercourse.

Karst: a landscape shaped by the dissolution of a layer or layers of soluble bedrock, usually carbonate rock such as limestone or dolomite. Many *karst* regions display distinctive surface features including sinkholes and fractures. See also "hazardous land".

Marine facility: a boathouse, boat dock, boat slip or marine railway

Meander belt allowance: The term meander belt allowance is the maximum extent that a water channel migrates. Other terms associated with meander belts are amplitude, wavelength, bend radius, bankfull width, point bars, pools, riffles and concave and convex banks. A meandering channel is a series of interconnected reaches. A reach is a length of channel over which the channel characteristics are stable or similar. For each reach, the meander belt should be centred on a line of axis drawn through the middle of the meanders or riffle zones, a line that essentially divides each of the meanders in half.

The width of a meander belt can be determined by analyzing the bankfull channel width of the largest amplitude meander. The meander belt allowance is defined as 20 times the bankfull channel width of the reach and centred on the meander belt axis. When determining the meander belt for these relatively straight reaches, the meander belt should be centred on the mid-line of the channel.

Minor Additions: Relates to limits on the type of use (i.e. residential habitable, residential non-habitable, commercial, industrial, institutional, etc. in hazardous areas. For residential uses where safe access is not available the size of the addition shall not exceed 20% of the gross floor area of the existing building or 20 square metres (215 square feet) whichever is the lesser. Where safe access is available somewhat larger additions resulting in increases of between 20% and 50% but not exceeding a maximum of 50 square metres (538 square feet) may be considered subject to applicable policies. No more than one minor addition will be considered per structure, and there can be no increase in occupancy or the number of dwelling units. Requirements are more specifically quantified in policy.

Mitigation: means a reducing of the adverse effects.

Non-apparent valley: are those drainage systems where the watercourse is not located within a valley corridor with discernable slopes, but relatively flat to gently rolling plains and is not confined by valley walls. The watercourse can contain perennial, intermittent or ephemeral flows and may range in channel configuration, from seepage and natural springs to detectable channels.

100 year flood: the flood, based on analysis of precipitation, snowmelt, or a combination thereof, having a return period of 100 years on average, or having a 1% chance of occurring or being exceeded in any given year

One-zone concept: Using this, planning authorities determine the flooding hazards limit, based on the 100-year flood or major storm-centred event, and prohibit all development or site alteration within those boundaries. This is the most effective way of minimizing threats to public

health or safety or property damage. The one zone concept is the preferred approach for the management of flooding hazards within river and stream systems as it provides the most cost effective means of minimizing potential threats to life and risks of property damage and social disruption. Where the one zone concept is applied, the entire flood plain or the entire flooding hazard limit defines the floodway (Figure 1)

Other water related hazards: water associated phenomena acting on shore lands other than flooding and wave uprush. This includes, but is not limited to, wave spray, ponding due to wave overtopping, ice accumulation and ice forces.

Peat Extraction: Peat extraction is an activity that can have significant negative impacts on the ecological, hydrological, social and economic values of wetlands. Impacts of extraction can include loss of vegetation and associated habitat for animals (potentially including species at risk); a lowering of the water table (due to drainage), which can affect local human uses and water supplies; degraded water quality; release of sequestered carbon; degraded air quality; and increased risk of fire.

Pond: A body of stagnant water without an outlet, larger than a puddle and smaller than a lake; or a like body of water with a small outlet.

Portable mobile building: means any dwelling that is designed to be mobile, and constructed or manufactured to provide a permanent or seasonal residence for one or more persons. This includes a park model trailer.

Protection works standards: means the combination of non-structural or structural works and allowances for slope stability and flooding/erosion to reduce the damage caused by flooding hazards, erosion hazards and other water-related hazards, and to allow access for their maintenance and repair.

Provincially Significant Wetlands: Wetlands that have been evaluated by the Ministry of Natural Resources as Class 1, 2 and 3 wetlands, as defined in the Ontario Government - Policy Statement on Wetlands"

Quality and quantity of water: means a parameter measured by indicators such as minimum base flow, depth to water table, aquifer pressure, oxygen levels, suspended solids, temperature, bacteria, nutrients and hazardous contaminants, and hydrologic regime.

Redevelopment: means the creation of new units, uses or lots on previously developed land in existing communities, including brownfield sites.

Regulation limit: The Upper limit of regulatory jurisdiction for a Conservation Authority regulation as defined by Section 2 of the applicable Section 28 *CA Act* regulations.

Regulatory flood plain: The 100 Year Flood Event Standard meaning rainfall or snowmelt, or a combination of rainfall and snowmelt producing at any location in a river, creek, stream or

watercourse, a peak flow that has a probability of occurrence of one per cent during any given year.

Repair: means to mend, remedy, restore, renovate to a good or sound state; contemplates an existing structure or thing which has become imperfect and return it to the condition in which it originally existed, as near as may be. (

Restoration means: to bring back to original state or bring back to a former place or condition; restoration is the act of restoring (may also apply to rebuilding or repairing).

Riprap: means a layer of stone of a prescribed specification to prevent the erosion of soil.

River, stream and small inland lake systems: means all watercourses, rivers, streams, and small inland lakes or waterbodies that have a measurable or predictable response to a single runoff event.

Safe Access: Vehicular and pedestrian access routes are considered safe if the depth of flooding, at the regulatory (1:100 year) flood level, along the full length of the travelled surface does not exceed 0.3 metres and the flood velocity does not exceed 1.0 metres/second.

Sewage works: means sewage works as defined in subsection 1 (1) of the *Ontario Water Resources Act*. (OBC Section 1.4 Defined Terms).

Sensitive: in regard to surface water features and ground water features, means areas that are particularly susceptible to impacts from activities or events including, but not limited to, water withdrawals, and additions of pollutants.

Shoreline ecological functions: the work performed or role played by the physical, chemical, and biological processes that contribute to the maintenance of the aquatic and terrestrial environments that constitute the shoreline's natural ecosystem. Shoreline ecological functions include, but are not limited to:

a) Streams. Fish and wildlife habitat; transport of water, sediment and organic material; and floodwater storage and attenuation;
b) Wetlands. Fish and wildlife habitat; pollution assimilation; sediment retention; shoreline stabilization; floodwater storage, attenuation and conveyance; wave energy attenuation; stream base-flow maintenance; and groundwater discharge/recharge;
c) Lakes. Fish and wildlife habitat; sediment retention; pollution assimilation; and floodwater attenuation, storage and conveyance;
d) Riparian Habitat Areas (shoreline vegetation). Habitat for water dependent and riparian dependent fish and wildlife; noise and visual screening; large woody debris and other natural organic matter recruitment; floodwater attenuation and storage; temperature maintenance; pollution assimilation; streambank stabilization; and supply of sediments and nutrients.

Site alteration: means activities such as grading, excavation and the placement of fill that would change the landform and natural vegetative characteristics of a site. (Provincial Policy Statement 2005)

Small quantities of fill: means a volumetric amount of fill not exceeding 10 cubic metres.

Stable slope limit: is the limit, or the setback that ensures safety if the slumping or slope failure occur. It represents the limit to which the slope would recede if it were to reach the long term stable slope inclination; at which point it would resist slumping and rotational slipping. The stability of slopes can be affected by everything from increases in loading, such as the placement of buildings, and changes in drainage patterns to erosion of the toe of a slope and loss of stabilizing vegetation on the slope face.

The stable slope allowance is determined by using a horizontal allowance measured landward from the toe erosion allowance equivalent to three times the height of the slope (3:1) OR through a valid study. The 3:1 is considered a minimum allowance.

Structure: means any material, object or work erected either as a unit or constructed or assembled of connected or dependent parts or elements, whether located under, on and/or above the surface of the ground. (i.e. swimming pools, hot tubs and fences)

Toe-erosion allowance: or the setback that ensures safety if the toe of the slope adjacent to the river or stream erodes and weakens the bank, increasing the risk of slumping. It includes:

a) average annual recession rate, based on a minimum 25 years of record or data to determine the toe erosion allowance over a 100-year planning horizon;
b) a 15 m toe erosion allowance measured inland horizontally and perpendicular to the toe of the watercourse slope (Figure 3) where the distance between the watercourse and the base of the valley wall is 15 metres or less (used as the default value for mapping of Regulation Limit);
c) toe erosion allowance based on a valid study which is based on at least 25 years of erosion data;
d) toe erosion allowance based on soil types and hydraulic processes (flow rates, volume, etc.), based on observations or analytical studies, and where the watercourse is 15 metres or less from the base of the valley wall.

Two-zone concept: This concept identifies the floodway and the flood fringe. The floodway refers to that portion of the flood plain where development and site alteration would cause a threat to public health and safety and property damage. In other words it is that portion of the flood plain required for the safe passage of flood flow and/or that area where flood depths and/or velocities are considered to be such that they pose a potential threat to life and property damage. (See figure 2). The flood fringe is the portion of the flood plain where development may be permitted subject to certain established standards and procedures. Because conditions vary, there is no province wide standard for determining the more hazardous areas of flood plains. But some factors to take into account include depth of water: velocity of flow, combined depth and velocity, vehicle access and structural integrity. These factors along with critical depth and

velocity limits are discussed in the Technical Guide, River and Stream Systems, Flooding Hazard Limit.

Unsafe Building: means the physical state of a property, structure, barrier, fence and/ or building(s), whether vacant or occupied, that in the opinion of the Property Standard Officer is a hazard to the public regarding fire, accident, health or safety.

Valleylands: means a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year.

Watercourse: means an identifiable depression in the ground in which a flow of water regularly or continuously occurs

Wet floodproofing: involves the design of a structure to intentionally allow flood waters to enter while maintaining the structural integrity and minimizing water damage to the structure. Its use is generally limited to certain specific non-residential/non-habitable structures (e.g. arena, stadium, parking garage), but many of the techniques of wet floodproofing can be used with certain dry floodproofing approaches. The intent of wet floodproofing is to maintain structural integrity by avoiding external unbalanced forces from acting on buildings during and after a flood, to reduce flood damage to contents, and to reduce the cost of post flood clean up. As such, wet floodproofing requires that the interior space below the level of the regulatory flood remain unfinished, be non-habitable, and be free of service units and panels, thereby ensuring minimal damage. Also this space must not be used for storage or immovable or hazardous materials, that are buoyant, flammable, explosive or toxic. Furthermore, access ways into and from a wet floodproofed building must allow for safe pedestrian movement.

Wetland: means land that:

a) is seasonally or permanently covered by shallow water or has a water table close to or at its surface; and

b) directly contributes to the hydrological fuction of a watershed through connection with a surface watercourse; and

c) has hydric soils, the formation of which has been caused by the presence of abundant water; and

d) has vegetation dominated by hydrophytic plants or water tolerant plants, the dominace of which has been favoured by the presence of abundant water, but does not include periodically soaked or wet land that is used for agricultural purposed and no longer exhibits a *wetland* characteristic referred to in clause c) or d).

Wetland boundary: the point where 50% of the plant community consists of *wetland* plant species as listed in Appendix 5 of "The Ontario *Wetland* Evaluation System – Southern Manual", Ministry of Natural Resources, 1993.

Appendix B: Floodproofing Guidelines and Design Standards

"Floodproofing" encompasses all protective measures required to ensure that a building and its contents will not sustain flood damages and that continued occupancy of the building can occur at least throughout the early stages of a 100 year flood. Since there will always be a probability of a flood event exceeding a 100 year flood, total protection from flood damage cannot always be assured.

B.1 General Floodproofing Principles

(i) Development that, according to these policies, is permitted in the flood plain must be protected by accepted floodproofing actions or measures.

(ii) Access for new buildings must be such that vehicular and pedestrian movement can occur during times of flooding.

(iii) Dry, passive floodproofing must be used whenever possible.

(iv) Residential/habitable buildings must always incorporate dry floodproofing measures.

B.2 Safe Access / Egress

The Provincial Policy Statement and associated technical guideline, identify safe access as a primary consideration before approval is granted for flood plain development. The availability of safe access is directly related to flood depth and water velocity. Access is safest if it is floodproofed to the 100 year flood level.

Access concerns include but are not limited to:

a) vehicular access routes (municipal roadways and private rights-of way);

b) pedestrian access routes (private laneways, driveways and walkways between residences and vehicular access routes).

B.2.1 Access in Flood Hazard Areas

(i) Where floodproofing to the regulatory flood level is not possible, vehicular access and parking lots must be designed such that the maximum depth of flooding will not exceed 0.3 metres and the maximum flood velocity will not exceed 1.0 metres/second.

(ii) Driveways/access roads may be filled to a minimum of 0.3 metres below the Regulatory Flood Level and to a maximum of 0.3 metres above the Regulatory Flood Level, with the sides of the driveway tapering down to existing grade at a 3:1 slope angle. (with the exception of required vehicular access to a structure that is floodproofed, then minimal fill and grading may be considered to allow for access.)

(iii) Driveway/access road side slopes should be stabilized with appropriate ground cover or another stabilization treatment.

(iv) Access routes must be designed to allow for passage of normal flow and flood waters without obstructing or impeding flow.

(v) An assessment by a Professional Engineer may be required, at the landowner's expense, for access in areas prone to flooding.

B.2.2 Access in Slope and/or Erosion Hazards

(i) Access must be constructed such that it is not prone to erosion or instability and will not cause or aggravate erosion or instability on neighbouring properties.

An assessment by a Professional Engineer may be required, at the landowner's expense, for access in areas prone to erosion or instability.

B.3 Design Requirements for Residential/Habitable Buildings

(i) New development, infilling, replacement and additions for a residential/habitable use must be dry, passive flood-proofed to the regulatory flood level. Where such requirements impact on, or are significantly out of context with neighbouring properties, other floodproofing approaches may be considered.

(ii) The design requirements for dry passive floodproofing are as follows:

a) the underside of the floor assembly closest to grade and all building openings must be at least 0.3 metres above to 100 year flood level;

b) where wave uprush may occur, the building must include measures addressing this impact, which in the MVCA watershed requires floodproofing to an additional 0.3 metres above the required floodproofing level described in a);

c) habitable space, including a basement, is not permitted below the regulatory flood level;

d) a crawlspace may be permitted subject to the following:
- height must not exceed 1.8 metres
- for a concrete slab floor the drawings must be stamped by a Professional Engineer, otherwise the floor must remain unfinished (i.e. gravel floor)
- the minimum floor elevation must be at least the 5 year flood level;

e) foundations, walls and floors located below the elevation of the 100 Year Flood level must be designed to withstand hydro-static pressures associated with this flood level;

f) materials for construction must be of a type not subject to deterioration by alternate wetting and drying;

g) all mechanical and electrical service shutoffs must be located at least 0.3 metres above the 100 Year Flood level.

B.4 Design Requirements for Non Residential Buildings

(i) Buildings that are used for non-residential purposes including commercial and industrial uses may be permitted in the flood fringe subject to the following:

a) the building and access must be floodproofed in accordance with the methods outlined in Appendix B.1 and B 2.;

b) for commercial or industrial uses, a foundation design and site grading plan must be prepared by a Professional Engineer to the satisfaction of the Authority;

c) any part of the building that is intended to be used for overnight occupancy must be dry-passive floodproofed to the standards required for residential uses.

Non-residential buildings intended for any of the uses listed under Section 5.2 (essential services, institutional uses and uses involving hazardous substances) are not permitted in the flood plain.

B.5 Fill Aprons for the Floodproofing of Buildings

Excessive filling in the flood plain can have negative impacts on water flow and storage capacity of the flood plain which can cause or increase flooding and/or erosion on other nearby properties. Excessive filling in the flood plain can also cause sedimentation resulting in impacts to water quality. To reduce these negative impacts, fill placement within the flood plain is generally limited to what is required for floodproofing purposes, which includes fil aprons. If warranted, a fill apron is permitted and is not mandatory. The placement of excessive fill for landscaping purposes is generally not permitted.

(i) Fill placement for the purposes of floodproofing a habitable dwelling shall be limited to a fill apron extending a maximum of 4.5 metres out from the foundation walls.

(ii) The top of the fill apron must be graded up to at least the regulatory flood level where it meets the exterior of the foundation wall, and up to a maximum of 0.15 metres above regulatory flood level.

(iii) The fill apron must be graded away from the foundation wall at a slope no steeper than 3:1 (horizontal:vertical).

B.6 Drainage Swales

Drainage swales that are required as a result of development or fill placement must be designed by a qualified professional to ensure that there is no impact to adjacent lands or the receiving waterbody.

Where a lot is being graded to an elevation that exceeds the grade of the adjacent property the lot grading must not result in additional runoff being directed onto adjacent properties. Grassed drainage swales must be provided between the fill area and the lot line where a natural drainage swale does not already exist (see details below).

(i) Where drainage swales are required, they should be designed to the following minimum standards:

a) The swale must be located entirely within the limits of the lot and shall not extend beyond the side yard lot lines into neighbouring properties.

b) The base of the swale should be to 0.2 to 0.3 metres (8 to 12 inches) in width.

c) The minimum depth of the swale should be 0.15 metres to a max. depth of 0.60 m.

d) The side slopes of the swale should not exceed a 3h:1v slope.

e) A 2% (50h:1v) minimum slope along the bottom of the swale is recommended for proper drainage - maximum grade of 8% (12.5h:1v).

f) The bottom of the swale should be graded smoothly concave.

g) The inside surface of the swale should be permanently stabilized with grass seed and mulch and/or other vegetation.

h) Rock check dams may be required in areas of potentially high flow.

B.7 Swimming Pools

Principal objectives of the Provincial Policy Statement are to prevent loss of life and to minimize property damage. A concern with swimming pools in flood prone areas (particularly in floodway situations) is the potential increased risk of property damage. Damage could occur in one or more of the following scenarios:

- pool fills with silts and other debris
- vinyl liner is punctures or torn
- side walls collapse or bottom cracks / heaves due to hydrostatic pressures
- pumps, heaters and filtration equipment damaged from high water levels and silting
- storage shed or other accessory buildings damaged
- chlorine or other pool chemicals spill causing contamination
- fencing traps debris and directs flood waters onto other flood-prone land
- pool is actually dislodged (if above-ground) becoming an obstruction to flood flow

Landowners are advised that filter / heater equipment, electrical connections, chemical storage, etc. should be constructed taking local flood levels into account.

Appendix C: Cut and Fill Guidelines

Site Grading

Within a floodway, MVCA may approve site grading/site alteration, in limited circumstances, in situations that meet the following conditions:

1) Minor Site Grading (Cut and Fill Balance Works)

The site grading/site alteration will be considered minor and generally can be approved without further detailed hydraulic analysis if:

a) The modification of the flood plain is required to obtain a useable area for building above (outside) of the Regulatory (1:100 year) flood plain. (i.e. part of the property is presently outside of the Regulatory flood plain but the distribution or orientation of this area is not suitable for development.

b) Does not create a new building area at a location that is presently totally within the flood plain.

c) The property is located in an area of existing development.

d) The site alteration is confined to lands with existing ground elevations that are no more than 0.3 metres lower than the estimated 1:100 year water surface elevation of the river or stream.

e) The area of the proposed cut or fill zones will be roughly equal to one another.

f) Safe access is available.

g) The loss of flood plain storage volume within the 1:100 year flood plain which will result from the placement of fill shall be fully compensated for by an incrementally balanced cut (or excavation) to be carried out in close proximity to and concurrently with the placement of the fill. This cut and fill operation must occur on the same property.

h) The resulting development meets all floodproofing requirements.

Appendix D: Two-Zone Areas

The following reaches of watercourses are administered using the Two Zone Concept:

Constance Bay - Ottawa River
Location: The lands within the Village of Constance Bay and Armitage Ave
Floodway: The floodway is defined by an elevation of less than 60.0 metres.
Flood fringe: The flood fringe is defined as the area between 60.0 metres and 60.8 metres (the 100 year flood elevation)

Mississippi Lake
Location: The entire lake shore of Mississippi Lake.
Floodway: The floodway is defined by the elevation of 135.0 metres or less.
Flood fringe: The flood fringe is defined as the area between the elevations of 135.0 metres and 135.73 metres.

Carleton Place
refer to River Corridor Study (Along High street)

Shirley's Brook (Klondike Area)
refer to Kanata North Environmental Management Plan/Stormwater Management Plan

Stittsville
refer to Amber lakes Flood Plain Study

20 and 50 Frank Nighbor Place

Appendix E: Geotechnical Evaluation Requirements

The following is a list of the items that are required to fulfill the Mississippi Valley Conservation Authority's requirements for a geotechnical slope evaluation. All of the following items must be carried out by a qualified geotechnical engineer.

a) Undertake a physiographic assessment of the slope and site features, through aerial photography review and field reconnaissance survey, to check for active erosion, shallow slips transitional type slopes, zones of active seepage or surficial erosion, etc. Identify areas of potential failure and identify the mechanisms of failure.

b) Survey and map the slope in detail.

c) Prepare surveyed cross-sections at the critical locations of the slope.

d) Carry out a field drilling program where appropriate to provide suitable assessment of the subsurface conditions of the slope including groundwater and bedrock conditions (the location, number and depth of borings needed is to be determined by the geotechnical engineers undertaking the study).

e) Carry out on-site testing, sampling, piezometric measurements and laboratory testing as determined appropriate by the geotechnical engineer.

f) Analyze existing static and seismic slope stability including factor of safety and determine the stable slope configuration for the site and appropriate development setbacks from the top and/or base of the slope based on the information obtained from items (a) to (e).

g) Determine and map the most suitable building envelope based on item (f) for each lot affected.

h) Include appropriate erosion protection and/or mitigation measures to the watercourse where active erosion exists on its slope side.

i) Identify any rapid drawdown of water level on slope plain, and if it present, demonstrate how the potential impact on slope stability assessed.

j) Prepare a report containing the findings of the study and include: a site map, all borehole logs, test pit results, survey cross sections, slope stability assessment, a map showing lot boundaries and building envelopes, existing regulation limits, Limit of Hazad line with sethack lines determined in (f) and an outline of structural, landscaping, and surface drainage measures that may be necessary as part of a future site plan agreement to maintain the long term stability of the structures and property.

NOTE: Depending on the site specific characteristics and the nature of the development proposal, additional information may be required.

Appendix F: Environmental and Hydrologic Impact Study and Procedures

IMPACT ASSESSMENT – WETLAND NATURAL HERITAGE FEATURES [1]

Discussion

Consistent with the conservation authority's responsibilities to address the effects of proposed development, it may be necessary to demonstrate that a development proposal will result in no negative impacts on natural heritage features and areas. From a regulatory perspective inside the wetland such negative impacts would include effects on the control of flooding, erosion, pollution and the conservation of land and would include both hydrological and ecological function. Around the wetland (within 120 metres) the CA requires that there be no adverse effects on the hydrologic function of the wetland.

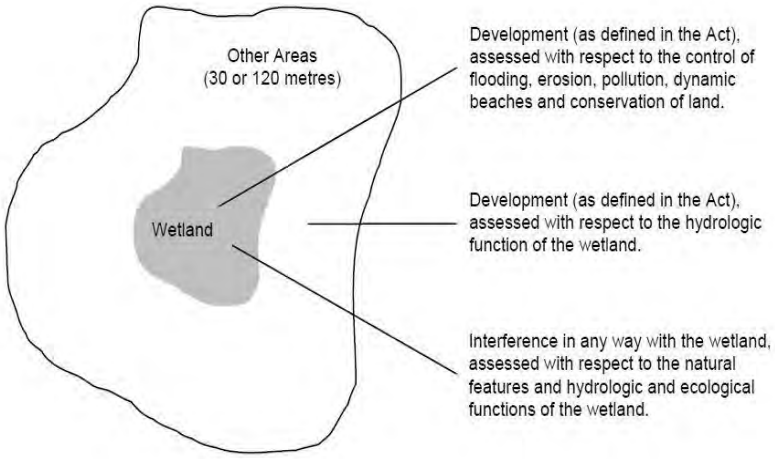


Figure 5. Three ways through which the *Conservation Authorities Act* and Individual CA Regulations address wetlands and other areas

The scale of the project and the characteristics of the feature will play a significant role in determining the scope of any necessary studies. In some cases, especially in more developed areas, available information [2] on natural heritage features may be sufficient to determine whether assessment is required. The impacts of smaller scale development (e.g. construction of a small addition or a small auxiliary building on an already developed lot) may sometimes be addressed simply by the application of best management practices. In other areas, however, determining whether an impact assessment is needed may be difficult, and a site investigation

[1] Most municipal Official Plans contain policies for protecting natural features. Municipal zoning documents identify specific areas to which OP protection policies apply.

[2] Watershed plans, municipal environmental management plans, community design plans and similar will often address the protection of natural heritage features. In other cases site specific information may have been collected associated with a specific development application.

and inspection may be required to identify potentially significant natural heritage features and areas requiring further investigation and analysis.

Methodology

To assist municipalities with administering their responsibilities under the Planning Act the Province has prepared guidelines for protecting natural heritage features. Such guidelines are contained within the Ministry of Natural Resources and Forestry (MNRF) ***Natural Heritage Reference Manual*** (Second Edition, March 2010); these policies are heavily based on requirements contained in this document. In addition, particularly with respect to hydrologic function, it is expected that proponents will rely on guidance contained in the Ministry of the Environment (MOE) **Stormwater Management Planning and Design Manual** (March 2003) and particularly Chapter 3 of that document. Frequently CAs assist municipalities with similar responsibilities by providing advice on applications under the Planning Act for which the municipality is the approval authority. The intent with the MVCA approach is to attempt to have municipal requirements and CA requirements be as complimentary as possible so as to avoid, wherever possible, duplication of effort.

Process for and Relationship between Impact Assessment Components

It is strongly recommended that the proponent consult with CA staff as early as possible concerning the proposed development.

Determining an Appropriate Level of Assessment

Figure 6. Steps to determine appropriate level of assessment (MNRF Natural Heritage Manual)

Once it has been established that a development application triggers the need for an impact assessment, the appropriate level of detail and effort required to assess the development impacts will vary, depending on the characteristics of the site and the proposed development.

Determining an appropriate level of assessment for an EIS or equivalent study is typically measured by factors that include the following:

- level of effort is correlated with the likelihood of a significant natural heritage feature or area being present (e.g., significant wildlife habitat is deemed to be present on the basis of factors such as the geographic range of a species or known occurrences of the species in the general area).
- the assessment effort is correlated with the level of analysis that may have occurred previously as part of a separate planning process (e.g., comprehensive studies to identify natural heritage areas and systems including significant features and areas).
- any field observations and investigations are scheduled to occur when the feature would be expected to be visible, if present.

In terms of the above factors, not all impact assessments have to be detailed and may be tailored to the situation. An appropriate level of effort for an adjacent lands study (i.e., EIS or equivalent study) could, for instance, take into account existing development, existing land use entitlements and the existing land use fabric.

A detailed assessment is appropriate, however, in cases in which:

- the potential impacts of a proposal are unknown and a precautionary approach is needed;
- impacts on natural heritage features are likely to occur;
- appropriate impact mitigation techniques may not be readily available;
- the significance level of the natural heritage feature is high;
- the planning stage for the proposed development is advanced;
- the proposal may lead to multiple or successive development or site alteration activities; and
- the potential development would result in the elimination of a significant natural heritage feature.

In situations in which comprehensive planning studies or natural heritage systems have been completed with site level information, the need for a detailed assessment may be reduced, and a more focused assessment may provide an adequate evaluation of potential impacts.

Regardless of the assessment undertaken, the level of detail must be sufficient to demonstrate that there will be no negative impacts on the natural features or their ecological functions. An impact assessment is more than a description of constraints on a property. It is an evaluation that must anticipate the implications of changes in land use and the interaction of these changes with the features and functions of an area. This requires a thorough inventory of abiotic conditions, flora and fauna; documentation of vegetation; analysis of the interrelationships among the biotic and abiotic elements of a site (i.e., its ecology); and determination of the effect the proposed

changes will have on the existing conditions. Most importantly, an EIS must determine whether the likelihood of negative impacts occurring on the natural features or their ecological functions is definite or probable if the development proceeds under a given proposed design. Decision makers need this information to determine the need for modifications to proposed plans, buffers and other mitigation strategies and to evaluate the change in the use of the land.

Contents of an Environmental Impact Study

The conservation authority can provide direction on the contents of an EIS or other equivalent study for impact assessment as part of the early consultation process for evaluating and demonstrating that there will be no negative impacts on natural features (including adjacent lands) or on their ecological or hydrologic functions. Discussion between CA staff and the proponent including, where necessary, qualified professionals acting on the proponents' behalf are, however, critical to ensuring site investigations and subsequent analysis are undertaken in a useful and meaningful way.

- Specific requirements and content provisions are set out in Sections 4, 6, 13 and Appendix B of the MNRF ***Natural Heritage Reference Manual*** (Second Edition March 2010). Section 13.5 (Impact Assessment Process pp. 123 - 132) provides the primary framework for analysis.

- Hydrologic function matters need to be addressed as outlined in Figure 8 of this document; where more detailed analysis is required particular attention should be given to Chapter 3 (Water Balance, Water Quality, Erosion Control and Water Quantity) of the **MOE Stormwater Management Planning and Design Manual**, MOE March 2003.

Review of Assessment

The proponent submits an impact assessment to the conservation authority. The conservation authority reviews the assessment to determine whether it is acceptable in terms of the completeness of the inventory and description of features, the thoroughness of the evaluation of potential negative impacts, the adequacy of the mitigation measures and monitoring programs identified, and so on.

The CA may request may be made that further information be provided or alternative mitigation and monitoring measures be considered. In addition MNRF and other agencies may be consulted regarding technical aspects.

Using the sample review list provided in Appendix B.2.2 can help a planning authority determine whether all issues have been adequately addressed in the impact assessment. The planning authority should review the impact assessment for completeness and technical accuracy.

13.5.6 Conservation Authority Decision

In making its decision about a proposed development, the conservation authority would consider the results of the assessment review, along with its effects on acceptance from a CA policy perspective. The conservation authority's decision will in particular be based on an assessment of the effect of the proposal on the control of flooding, erosion, pollution, the conservation of land and effects with respect to the hydrologic function of the wetland. The development or interference may be approved, approved with conditions or denied.

Contents of an Environmental Impact Study - SAMPLE CHECKLIST

C.2.2 Sample Checklist for Use in Assessing Impacts of Development

Site-specific assessments of development impacts could include these and other types of information:

1. General Information

- identity of proponent
- identity of proponent's representative (consultant)
- impact assessment submission date
- executive summary

2. Background Information

- site setting
- surface and subsurface soils
- landform type
- landform position
- natural heritage area boundary
- catchment boundary
- drainage pattern
- vegetation communities
- general habitats
- critical habitats
- significant species
- land use patterns
- resource use
- type/position of the development
- summary of key ecological functions
- potential impacts
- predicted effects

3. Elements of Site-Specific Assessments of Impacts

- understanding of hydrogeological setting, including fluvial geomorphology
- hydrological information and modelling
- water-balance exercise
- water-quality information
- habitat assessment details for terrestrial and aquatic systems
- modelling of habitat, if required
- ELC
- confirmation and detailed characterization of significant features
- characterization of linkages (terrestrial and aquatic)
- characterization of values
- characterization of impacts on key ecological functions
- mitigation strategy, net effects predictions and monitoring recommendations
- compatibility with planning area natural heritage systems, or other natural heritage strategies

4. Site-Specific Impact Assessment Map

Depending on the type of assessment and the nature of the development, site-specific impact assessment map scales can vary (e.g., 1:10,000 to 1:2,000) and could include the following information:

- title
- north arrow
- scale
- legend: date of production/revision, identity of proponent and representative
- natural heritage area and adjacent lands
- detailed drainage patterns; inflows and outflows
- presence of control structures, culverts, etc.
- water-level gauge locations
- basins and sub-basins
- soil textures

- regional and local groundwater flow patterns including seepage zones (conceptual)
- water-quality sampling locations
- detailed terrestrial and aquatic habitat information (i.e., community boundaries)
- spot locations of significant flora and fauna
- locations of critical habitat
- general cover types of adjacent lands
- locations of terrestrial and aquatic linkages
- locations of resource harvest/use
- impact/effect identification:
  - drainage boundary change
  - outfall locations
  - detailed development footprint (e.g., pervious and impervious surfaces, lot fabric, excavation locations and depths, grading information, topsoil storage locations, stormwater management design)
  - habitat removal
  - effects on significant features (e.g., fish barriers)
  - linkage fragmentation
  - value displacement
- mitigation:
  - facility locations that use best management practices
  - protective barriers (temporary and permanent)
  - rehabilitation/enhancement measures
  - plantings
  - monitoring

Figure 7. Sample checklist for assessing impacts of development

Items identified in the checklist only represent minimum reporting requirements for the development proposals; additional requirements may be identified depending on specific site conditions encountered and the scope of the actual development proposed. Pre-consultation will determine the scale of the development impacts; a full site EIS or a comprehensive EIS may be required dependent on the nature of what is proposed and site conditions encountered.

Step 1: **Identify aspects of the Proposed Development or Alteration that could trigger impacts**

- Will overland flow pathways to or from the wetland be altered by regrading of surface contours or re-routing of existing ditches or watercourses?
- Does the application involve the installation of any temporary or permanent drainage works, including surface ditches or channels and subsurface piped systems, with or without pumping equipment?
- Will the project result in the removal of native soil and its replacement by structures or materials with different water retention and hydraulic conductivity characteristics?
- Will grades be raised in such a way as to cause consolidation of subgrade materials and changes in their water retention and hydraulic conductivity characteristics?
- Will site runoff, evapo-transpiration or infiltration amounts change (annually, seasonally) due to changes in site imperviousness, land cover, or topography, or due to maintenance practices such as snow removal?
- Is the proposed development or site alteration for the purpose of establishing a land use or activity that will require the withdrawal of water from the wetland?

*If the answer to any of the questions in Step 1 is **NO**, the proposed development will be deemed to have no effect on the hydrologic functions of the wetland. No further assessment of potential impacts will be required, and permission will be granted with standard conditions requiring the application of best management practices appropriate to the proposed activities.*

If the answer to any one of the Step 1 questions is yes, further assessment of the application's impact on hydrologic functions will be required. The required scope of the hydrologic impact assessment will be determined in consultation with CA specialists in hydrology, groundwater sciences and wetland ecology, and may include, but not necessarily be limited to the following steps.

Step 2: **Characterize the key hydrologic characteristics and functions of the wetland, from a watershed management perspective**

To understand the impact of the development on the wetland and its role in the hydrology of the catchment and sub-watershed in which it is located, the following information is required, at a minimum:

- connectivity of the wetland to the local stream fabric (in terms of streams flowing into the wetlands and streams flowing out of the wetland)
- a conceptual understanding of the surficial geology of the wetland's surroundings, the wetland's catchment area, the wetland's position within and areal extent relative to the subwatershed in which it is located; watershed report cards and associated catchment reports / data sheets may be of assistance
- a conceptual understanding of the subsurface conditions within the wetland (the nature of its substrate and underlying materials, depth to bedrock, etc.)
- an understanding of water table elevations within the wetland and adjacent areas and their normal range of fluctuation throughout a typical year; and characterization of the hydroperiod of the wetland
- if available for the subcatchment, historical streamflow and water level records should be obtained and interpreted

Based on this information, an interpretation of the role of the wetland in moderating extreme flows (during period of heavy precipitation or snowmelt, or extended droughts) and its importance in terms of recharging ground water resources can be made.

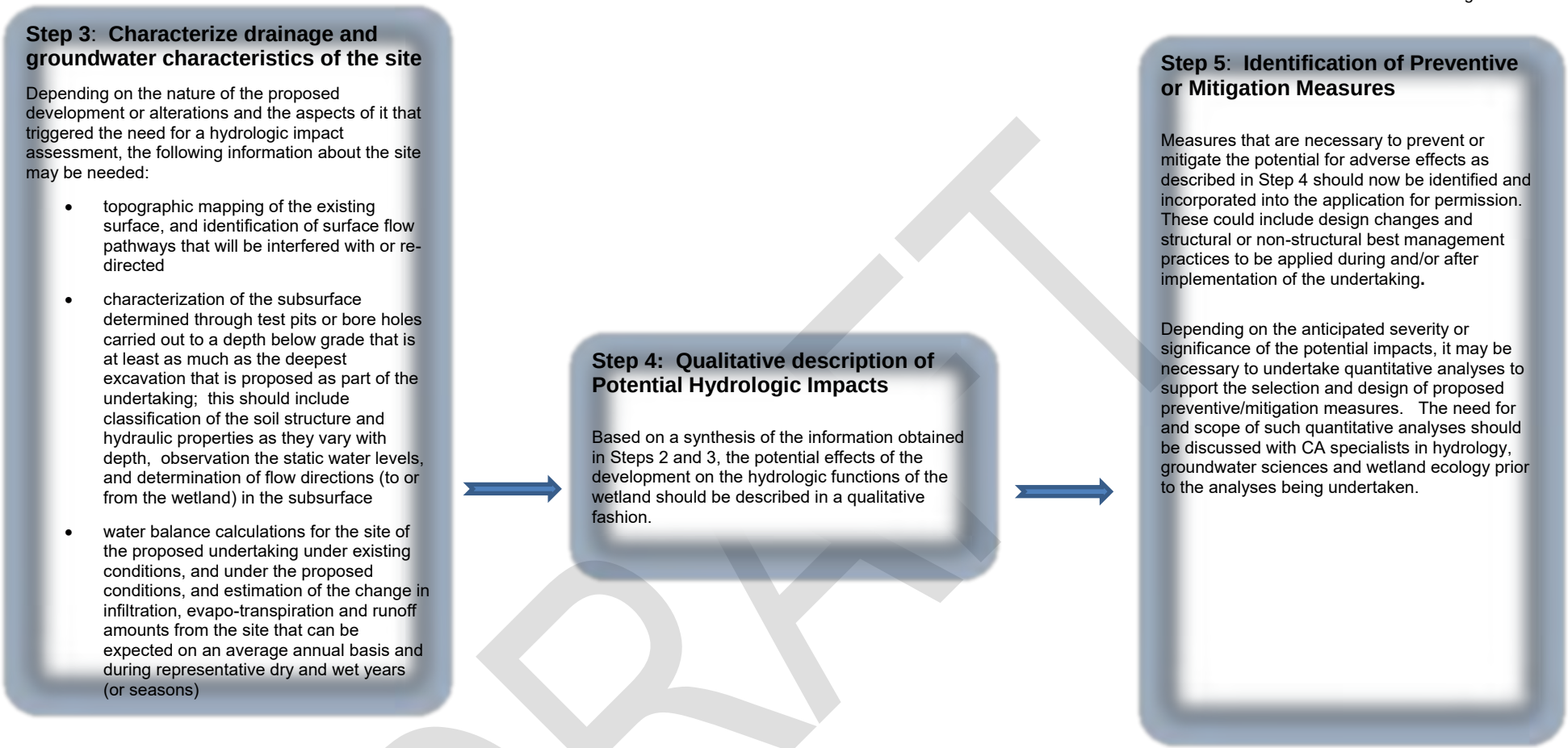


Figure 8. Hydrologic Impact Assessment Procedures

Appendix G: Guidelines For In-Water and Shoreline Works

Introduction

Alterations or works within or along a watercourse or shoreline require written permission from MVCA prior to the works being undertaken, in accordance with Ontario Regulation 153/06. In-water works are often required to realign watercourse, protect shorelines, repair and replace infrastructure and for water taking activities.

These guidelines apply to in-water and shoreline works, and related activities. They will be used by MVCA to review permit applications to ensure that these proposed activities meet the intent of the Section 28 Program Objectives for implementing of Ontario Regulation 153/06.

G.1 General Guidelines

The following general guidelines will be considered in reviewing applications under Ontario Regulation 153/06 for all in-water, watercourse alterations and shoreline works.

(i) Base flows must not be adversely affected by any watercourse or shoreline alterations.

(ii) The design of projects involving shoreline or watercourse alterations where natural heritage features, such as Areas of Natural or Scientific Interest (ANSI) and shoreline wetlands, may be present will be required to take into consideration the ecological functions of the watercourse and related features while allowing for compatible development.

(iii) Timing windows restrict in-water work related to an activity during certain periods in order to protect fish and/or other species from impacts of works or undertakings in and around water during spawning migrations and other critical life stages. In or near-water works must respect the timing window guidelines for fish spawning and turtle nesting (as established by the Ontario Ministry of Natural Resources and Forestry) and species listed as threatened or endangered under the *Endangered Species Act* (administered by MECP) or *Species at Risk Act* (administered by DFO for aquatic species).

(iv) Erosion and sediment control (ESC) measures must be installed before, during and post construction and remain until the site is permanently stabilized. ESC measures may include the use and maintenance of check dams, silt fences or barriers, inlet screens, sediment ponds, buffer strips or other effective measures deemed necessary by the MVCA. Ontario Provincial Standard Drawings (OPSD) for ESC measures can be used as a reference for installation and application of control measures.

(v) The use of materials that may result in pollution will not be permitted for the construction of near or in-water structures that will be temporarily or permanently inundated with water (i.e.

railway ties, pressure treated lumber). Native, untreated materials (i.e. white cedar, hemlock) will be required in these applications.

(vi) All on site activities, including maintenance procedures, are to be conducted in a manner that will prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into the water.

(vii) It will be the responsibility of the landowner/applicant to provide any studies or reports necessary for the Authority's review and evaluation of the proposal.

G.2 Shoreline Alterations / Modifications

These works include bio-engineering, rip-rap and vertical shoreline walls usually composed of armour stone, masonry rock, concrete, steel, wood and plastic or gabion baskets.

While vertical shore walls have short term benefits, the retention of existing emergent aquatic vegetation and planting of trees and shrubs on the shoreline bank is the preferred method of shoreline protection. Retention of existing shoreline vegetation can be an effective method of preventing erosion and shall be incorporated into shoreline alteration proposals. Rip-rap, which is the placement of clean angular stone or rock rubble on a slope, should be used in combination with bio-engineering methods where bio-engineering methods alone would be ineffective. Properly sized rip-rap placed along the waterfront over a geotextile filter fabric dissipates wave action and prevents soil particles from washing out while allowing land-based moisture to naturally infiltrate back into the waterbody.

(i) Preservation or enhancement of natural vegetated shorelines and buffers is be required before other alternatives are considered.

(ii) Where the only alternative to preventing shoreline erosion is shoreline hardening, the accepted method is rip rap, which is defined as angular blast rock backed with non-woven geotextile filter fabric, placed on a 2:1 (H:V) slope, following the natural contour of the shoreline and supplemented with native vegetation along the top.

(iii) Where required the upland slope shall be excavated to create the appropriate slope angle. Filling, excavation or dredging of the lake or river bed to accommodate rip-rap shall not be permitted.

(iv) The construction of vertical structures (retaining walls (concrete, armour stone), gabion baskets, etc.), will not be permitted immediately along the shoreline of a lake, river or watercourse where it can be expected that under normal conditions, the structure will be in contact or inundated by water for an extended period of time.

(v) The replacement of a vertical structure is deemed to be new construction, in which, the reestablishment of natural conditions is required to be achieved or a less invasive form of erosion control (i.e. rip rap, bioengineering) shall be installed, if feasible.

(vi) The construction of a vertical structure may be permitted along the shoreline of a watercourse if the following conditions are met and it has been deemed acceptable by the MVCA:

a) The vertical structure is located above the normal high water mark of the watercourse or an area that is seasonally or temporarily inundated with water;

b) Encroachment on the bed of or into the watercourse will not occur to minimize placement of fill in the flood plain;

c) The height of the vertical structure does not exceed the existing grade of the property if it is located within an identified regulatory flood plain;

d) The toe of the vertical structure is protected with rip rap or a natural vegetated buffer along the base of the retaining wall;

e) Filter cloth shall be installed behind the shore wall to prevent the migration of fines into the water;

f) All backfill shall be clean imported material;

g) Any material excavated as part of construction shall be removed off site in a contained manner and disposed of within an approved area outside of any regulatory flood plains, wetlands or other regulated areas, and a minimum distance of 30 metres from the watercourse; and

h) Construction of a vertical structure is the only effective option to repair active erosion due to the site conditions (bank height, soil type)

(vii) Vertical structures that exceed 1.0 metres (3.3 feet) in height, must be designed and approved by a Professional Engineer.

(viii) Erosion control measures shall not be placed or encroach beyond the existing toe of the shoreline slope.

(ix) Encroachment of rip-rap up to 1 metre onto the lake or riverbed may be supported if the encroachment is required to protect trees that support shoreline stabilization.

(x) A proposal will be considered a repair if the proposed work affects less than 50% of the existing erosion protection along the shoreline and there is no change in the dimensions (width, height, length) of the existing erosion protection.

Appendix I: Guidelines for Meander Belt Width Assessments

Where permitted by policies within this document, a meander belt width assessment may be submitted to provide further understanding of an erosion hazard within a not apparent valley. The Ministry of Natural Resources (Technical Guide for River and Stream Systems: Erosion Hazard Limit, 2002) recommends that the following list components should be included within any meander belt width assessment prepared by a qualified professional:

(i) Discharge regimes;
(ii) Slope, sinuosity, width-to-depth ratios, particle size of sediment in river/stream beds and banks, stream entrenchment ratios and landform feature/stability class;
(iii) Drainage areas and patterns of the system;
(iv) Determination of the meander pattern (e.g. amplitude, radius of curvature, meander length, concave and convex banks, spacing of pool and riffle zones, and the presence or remnant meanders or oxbow lakes);
(v) Bedload, suspended load or dissolved loads;
(vi) Channel roughness and shear stress required to move sediment loads;
(vii) Bankfull discharge and channel determination; and
(viii) Potential for lateral or downstream migrations of the meander belt allowance.

REPORT 3131/21

TO:	Policy & Priorities Committee, Mississippi Valley Conservation Authority
FROM:	Alyson Symon, Watershed Planner
RE:	**Draft Mississippi River Watershed Plan**
DATE:	April 30, 2021

Recommendation:

That the Policy & Priorities Committee recommend that the Board of Directors direct staff to release the Draft Mississippi River Watershed Plan for public consultation and return with final document for approval.

1.0 BACKGROUND

Update of the *Mississippi River Watershed Plan* was identified as a priority project in MVCA's *2016-2019 Corporate Strategic Plan*. The current plan was prepared in 1983 and a new plan was needed to guide MVCA's activities in the watershed.

Work on the update began in 2019 and occurred with considerable community engagement over a period of 18 months. The new draft plan reflects current watershed conditions and anticipated changes in population, land use, and the environment, including the impacts of climate change. It identifies key issues and challenges, and presents strategic actions aimed at maintaining a healthy river and watershed while balancing the needs of it many users.

2.0 WATERSHED PLANNING

Integrated Watershed Management is the process of planning and managing human activities and natural resources on a watershed basis. It allows for the protection of important water resources, while addressing critical issues such as the current and future impacts of climate changes land . A Watershed Plan provides for the documentation of watershed management conditions and needs, the identification of related challenges, and the planning of strategic actions to address those needs and challenges.

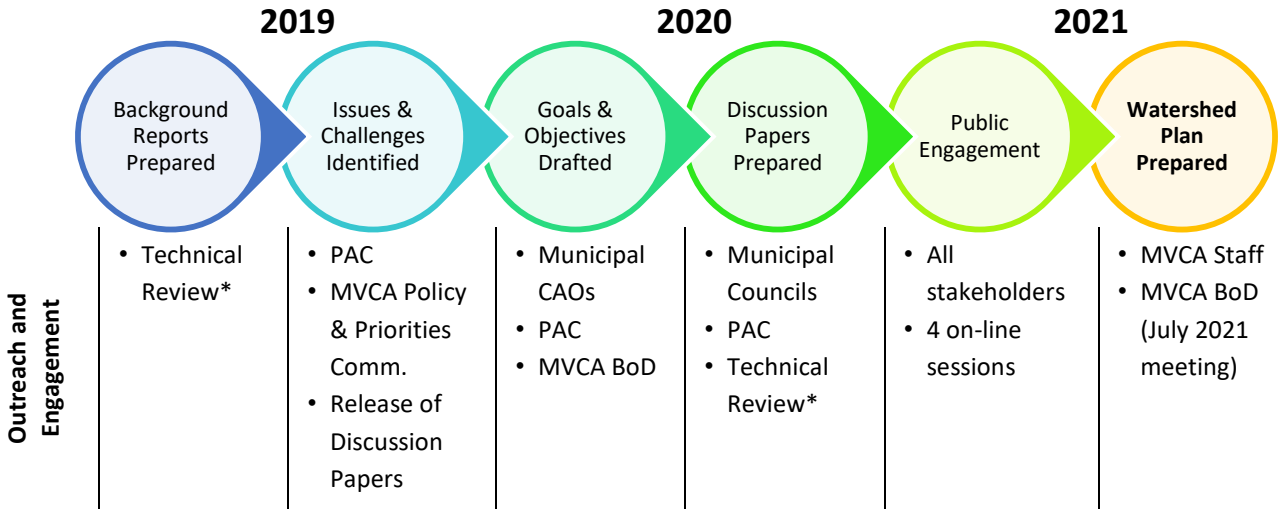
2.1 Planning Process

Watershed planning has four key phases:

- Background research and documentation (characterize the watershed)
- Identification of Issues, Goals & Objectives, and Strategic Actions
- Drafting and approval of the Plan
- Implementation, review and update of the Plan

From the outset, partner/stakeholder engagement was identified as crucial to the success of the Plan—both for its development and future implementation. Figure 1 illustrates the key steps carried out and how partners/stakeholders were involved.

FIGURE 1: Planning and Stakeholder Engagement Process



2.2 Community Engagement

Early in the process, a **Public Advisory Committee (PAC)** was established with representation from across the watershed and different sectors of the economy. The PAC was involved throughout the planning process and served as sounding board, technical editors, and community engagement ambassadors.

Key documents that underwent broad circulation and consultation were the following:

Backgrounders – four comprehensive reports were prepared that document the current conditions, key findings, and potential issues under the following themes: Physical Environment, People and Property, Natural Systems, and Asset Management.

Discussion Papers – eight short documents were used to zero-in on specific land uses or themes in order to engage the broader public and stakeholders regarding potential actions:

- Agriculture
- Municipal Infrastructure
- Water Management
- Natural Systems
- Waterfront Properties
- Forestry
- Tourism
- Growth and Development

Following release of the discussion papers, four Zoom **Lunchtime Talks** were held in Q1 2021 on the following topics, with a total of 180 registered participants:

- Growth and development
- Water management
- Waterfront properties, and
- Natural Systems

Videos of the Lunchtime Talks uploaded to YouTube were viewed a further 150^{+} times.

Technical consultations were used throughout the project to ensure quality control, and included internal review by MVCA staff and external circulation of the above and other draft documents to federal and provincial agencies, Health Units, and municipal staff. Further outreach to **municipalities** included:

- one on one briefing of municipal CAOs in Q1 2020 on the project;
- project updates to municipal councils in Q4, 2020 regarding interim findings; and
- two zoom meetings for municipal planners and public works staff to discuss potential implementation actions.

The **Policy & Priorities Committee** reviewed all Backgrounders, and assisted in identifying issues and challenges, and in developing the Goals & Objectives that were approved by the Board of Directors in December, 2020.

Three short promotional videos, focussing on agriculture, forestry and waterfront development were produced and shared during the public information sessions and by social media. The videos featured interviews with subject matter experts from the Public Advisory Committee (PAC).

As a result of the agricultural video, one member of the PAC was also interviewed on the Valley Heritage Radio (Renfrew) “Barnyard Breakdown” show and helped to promote interest in the Watershed Plan.

Finally, over February-March 2021 a **public survey** was used to collect input on the draft strategic actions, with 62 completed surveys.

While an **Indigenous Engagement Plan (IEP)** was prepared early in the project, with four local communities expressing interest in participating, the impacts of COVID-19 effectively halted further engagement as it was agreed by both sides that in-person meetings were necessary for early relationship building; and that engagement would resume once conditions allowed. To that end, a commitment was made to revisit the Watershed Plan, as needed, to address indigenous issues as identified at a future date.

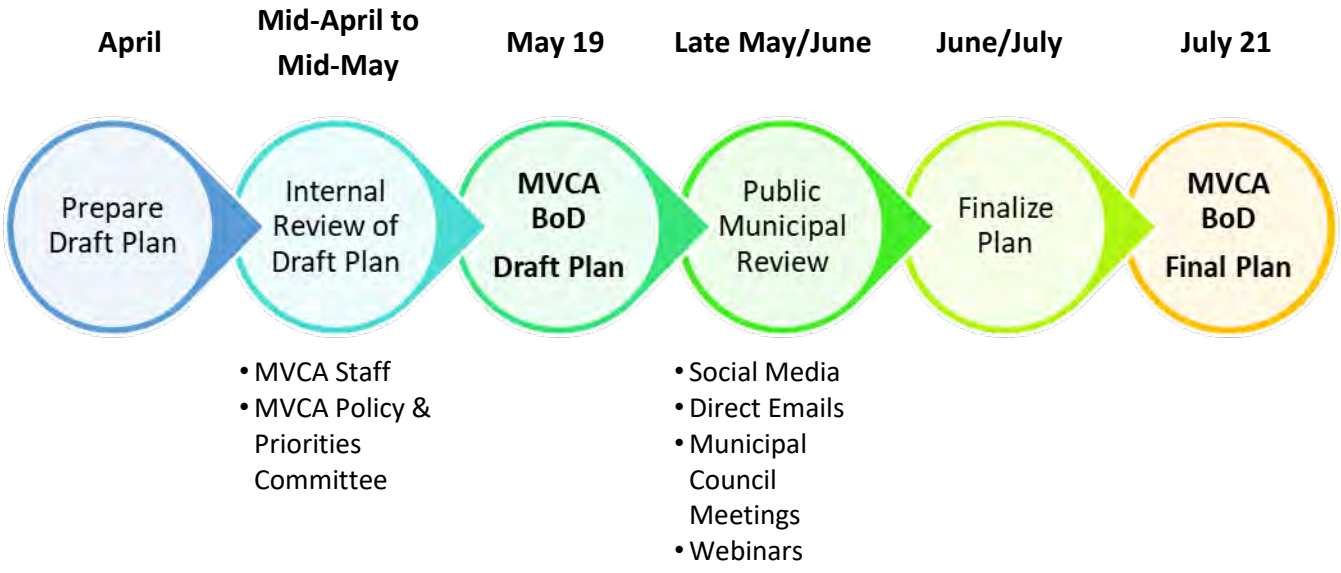
Thirty-three actions arose from the above planning process. Actions have been divided into two tables that show which watershed plan goals they support (refer to Attachment 1):

- Attachment 2 lists the actions that clearly support regulated programs and services as defined per Bill 108 and Bill 229; and
- Attachment 3 presents actions that are not clearly mandatory and may require municipal MOUs or other funding agreements to implement.

3.0 NEXT STEPS

The next steps in the Watershed Plan process are shown in Figure 2. After the draft plan is considered by the MVCA Board of Directors at their May meeting, a second broad public consultation will be launched. Through late May and into June, the MVCA General Manager will present the draft Plan to each municipal council. Public engagement will be promoted through print media, social media, and direct emails, with a comment deadline of June 30th 2021. The consultation will be directed to all of the groups and individuals that were consulted in the previous round of engagement. The Watershed Plan will be finalized and presented to the MVCA Board of Directors at the July 2021 meeting.

FIGURE 2: Next Steps - Review of Draft Mississippi River Watershed Plan



ATTACHMENT 1

WATERSHED PLAN GOALS

These Watershed Plan goals, adopted by the MVCA Board of Directors in December 2020, 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 use and manage both surface water and groundwater wisely to meet current and future needs under normal and extreme conditions.
3. To minimize risks to human life and property due to flooding, erosion, and unstable slopes and soils.
4. To sustain or improve current water quality for all users.
5. To increase our resiliency and adaptive response to climate change.
6. To support environmentally sustainable growth and economic development.
7. To maintain, enhance, or restore natural features and systems for all users.
8. To support learning and environmental stewardship.

ATTACHMENT 2: ACTIONS THAT SUPPORT REGULATED PROGRAMS AND SERVICES PER BILLS 108/229:

i. Programs and services related to the risk of natural hazards *(Conservation Authorities Act).*

ii. Programs and services related to the conservation and management of lands owned or controlled by the authority, including any interests in land registered on title *(Conservation Authorities Act).*

iii. Programs and services related to the authority's duties, functions and responsibilities as a source protection authority under the (*Clean Water Act, 2006).*

iv. Programs and services related to the authority's duties, functions and responsibilities under an Act prescribed by the regulations.

DRAFT WATERSHED PLAN ACTIONS	**RATIONALE**	**PARTNERS**	**GOALS SUPPORTED**							
			1 collaboration	2 water quantity	3 natural hazards	4 water quality	5 climate change	6 growth & develop	7 natural systems	8 education
1. Undertake meaningful engagement and establish new relationships with indigenous partners through implementation of an Indigenous Engagement Plan and through ongoing engagement in watershed initiatives.	Respect treaty rights.	MVCA INDIGENOUS	X						X	X
2. Apply a climate change lens to all strategic directions within this Plan.	A key overriding challenge impacting all program areas.	All Partners and Stakeholders listed throughout this Plan	X	X	X	X	X	X	X	X

DRAFT WATERSHED PLAN ACTIONS	RATIONALE	PARTNERS	GOALS SUPPORTED							
			1 collaboration	2 water quantity	3 natural hazards	4 water quality	5 climate change	6 growth & develop	7 natural systems	8 education
3. Work with all partners to continue to support environmentally sustainable growth and development objectives on a watershed basis for the protection of watershed values and features.	A key overriding challenge impacting all program areas.	All Partners and Stakeholders listed throughout this Plan	X	X	X	X	X	X	X	X
4. 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.	Directly supports Natural Hazard and Source Protection responsibilities	MVCA(L) POWER PRODUCERS UNIVERSITIES MECP WSC		X	X	X	X	X		X
5. Update the Mississippi River Water Budget to better evaluate water needs and use by completing the recommendations of the MRSPP Tier 1 budget assessment and incorporating climate change considerations.	Directly supports Source Protection responsibilities	MVCA(L) MECP		X			X	X		
6. Undertake a Water Storage Capacity and Management Study of both man-made (dams and reservoirs) and natural storage (wetlands) options and capacity.	Directly supports Natural Hazard and Source Protection	MVCA(L) UNIVERSITIES		X	X		X	X	X	

DRAFT WATERSHED PLAN ACTIONS	RATIONALE	PARTNERS	GOALS SUPPORTED							
			1 collaboration	2 water quantity	3 natural hazards	4 water quality	5 climate change	6 growth & develop	7 natural systems	8 education
7. Update Mississippi River Water Management Plan to build on modeling, water budget work and storage assessment completed under Actions 4, 5, and 6 to assist in rebalancing the competing interests for the watershed's water resources where needed.	Directly supports Natural Hazard and Source Protection	MVCA (L) MNRF(L) POWER PRODUCERS		X	X		X	X		
8. Develop and implement an Asset Management Plan for water control structures.	Directly supports Natural Hazard and Source Protection	MVCA(L) MUNIC		X	X		X			
9. Improve the MVCA hydrometric (water level and flow monitoring) network, to increase automated monitoring capabilities and overall efficiency.	Directly supports Natural Hazard	MVCA WSC Shared leadership roles		X	X		X			
10. Work with municipalities, agriculture and development communities, landowners and other partners to quantify, value and protect wetlands as hydrologic and natural assets.	Wetland Regulation and directly supports Natural Hazard	MVCA MUNIC UNIVERSITIES DEVEL & AGRI NGOs Shared leadership roles	X	X	X	X	X	X	X	X
11. Enhance response planning and readiness through the Low Water Response Team to address low water response and to ensure it includes representation from all key water use sectors.	Responsi-bility assigned through	LWRT(L) MUNIC MNRF	X	X		X	X	X		X

DRAFT WATERSHED PLAN ACTIONS	RATIONALE	PARTNERS	GOALS SUPPORTED							
			1 collaboration	2 water quantity	3 natural hazards	4 water quality	5 climate change	6 growth & develop	7 natural systems	8 education
	Provincial *"Ontario Low Water Response, 2010"*									
12. Maintain up to date hazard mapping to identify and map flood and erosion risk areas, including effects of climate variability and change.	Directly supports Natural Hazard	MVCA (L) MNRF MUNIC			X		X	X		
13. Work with MNRF to assess and update current floodplain standard (100 Year), policies, and floodproofing measures to address conditions under typical and extreme events.	Directly supports Natural Hazard	MVCA MNRF(L) MUNIC			X		X	X		
14. 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.	Directly supports Natural Hazard	MVCA (L) MUNIC			X		X	X		
15. Develop an approach to identifying and mitigating potential risks associated with unstable slopes and unstable soils throughout the watershed.	Directly supports Natural Hazard	MVCA(L) MUNIC MNRF			X			X		
16. Continue to support the Ministry of Environment, Conservation and Parks (MECP)Provincial Water Quality Monitoring Network (PWQMN) in collecting baseline surface water quality data.	Supports Source Protection	MECP(L) MVCA	X			X		X		X

DRAFT WATERSHED PLAN ACTIONS	RATIONALE	PARTNERS	GOALS SUPPORTED							
			1 collaboration	2 water quantity	3 natural hazards	4 water quality	5 climate change	6 growth & develop	7 natural systems	8 education
17. Improve the groundwater monitoring program to meet MVCA and municipal source water protection requirements. *(CA responsibility under Clean Water Act)*	Directly supports Natural Hazard and Source Protection	MECP(L) MVCA RVCA MUNC HEALTH UNITS		X				X		
18. Continue to support municipalities in actions prescribed by the Mississippi-Rideau Source Protection Program. *(Responsibility under Clean Water Act)*	Directly supports Source Protection	MVCA-SPA(L) MUNIC(L) Shared leadership roles	X	X		X	X	X		X
19. Continue to offer Septic Approval and Re-Inspection Programs for municipalities and encourage all municipalities to implement septic re-inspection programs in high priority area such as waterfront and rural settlement areas.	Supports Source Protection.	MUNIC(L) MRSSO(L) Shared leadership roles	X			X		X		X
20. Develop a Land Conservation Strategy to mitigate flood, erosion and other natural hazards, and to support the ecological services provided by natural systems.	Can support both core and non-core programs	MVCA(L) MNRF MUNIC AGRICULTURE, DEVELOPMENT & FORESTRY COMMUNITIES LAND TRUSTS OTHER CONSERVATION GROUPS	X	X	X	X	X	X	X	X

ATTACHMENT 2: ACTIONS NOT DIRECTLY ALIGNED TO PROGRAMS AND SERVICES REGULATED PER BILLS 108/229:

DRAFT WATERSHED PLAN ACTIONS	RATIONALE	PARTNERS	GOALS SUPPORTED							
			1 collaboration	2 water quantity	3 natural hazards	4 water quality	5 climate change	6 growth &	7 natural systems	8 education
1. Extend the role of the MVCA Public Advisory Committee (PAC) for the implementation and updating of the Watershed Plan.	* Might be core depending on amendments to act/regulations	MVCA SECTOR REPRESENTA-TIVES	X							X
2. Continue to collaborate with and promote collaboration among lake associations through networking groups and direct partnerships.	Supports many MVCA traditional objectives	MVCA, LAKE ASSOC., FOCA	X			X	X			X
3. Support waterfront property owners in implementing adaptive management measures to address potential impacts of variable water levels.	Supports hazard mitigation and climate resiliency	MVCA WATERFNT GROUPS MUNIC	X	X	X		X			X
4. Support Hydro Producers and municipalities in undertaking an Ice Risk Assessment if deemed beneficial.	Supports water management goals	MVCA HYDR0(L) MUNIC(L)		X	X		X			
5. Support municipalities in assessing and enhancing stormwater management in new and existing developments.	Supports hazard mitigation and climate resiliency	MUNIC(L) MVCA DEVEL	X	X	X	X	X	X		X
6. Work with municipalities, agriculture and development communities, and other landowners and	Supports hazard mitigation and climate resiliency	MUNIC(L) MVCA DEVEL & AGRI NGOs	X	X	X	X	X	X		

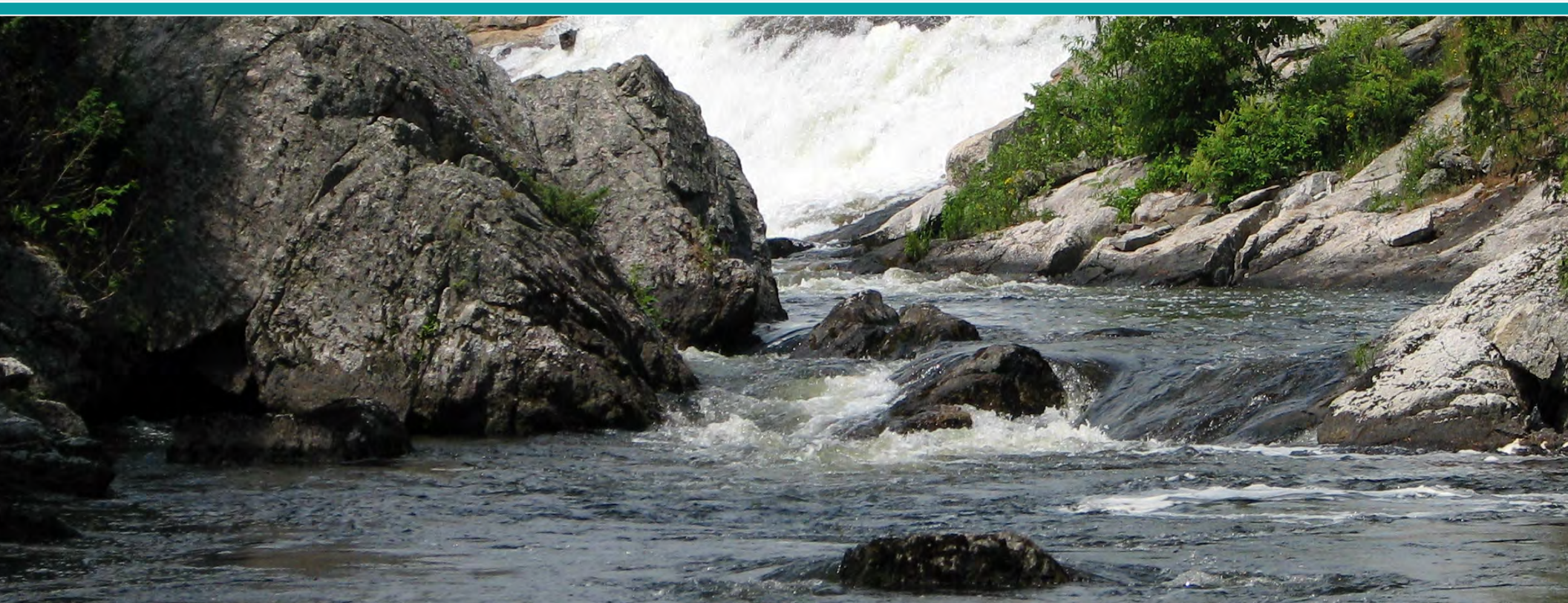
DRAFT WATERSHED PLAN ACTIONS	RATIONALE	PARTNERS	GOALS SUPPORTED							
			1 collaboration	2 water quantity	3 natural hazards	4 water quality	5 climate change	6 growth &	7 natural systems	8 education
partners to enhance on-site retention and infiltration of water.										
7. Review existing and potential environmental monitoring programs and identify opportunities for improvement/collaboration. (Including MVCA, Provincial, NGO and Citizen Science programs/opportunities).	Current focus on recreational water quality. Could be adjusted to support Source Protection Responsibilities and/or natural system and land conservation goals.	MVCA MECP OTHER GOVNT NGOS CITIZEN SCIENCE ETC.	X			X	X	X	X	X
8. Continue annual analysis and reporting of water quality conditions presented at a subwatershed scale and adjust reporting cycles, parameters, and geographic coverage where needed.		MVCA		X		X	X			X
9. Work with municipalities and the MNRF to improve application and coordination of regulatory tools for the protection of water quality, shoreline and riparian areas.	Water quality again. MVCA needs to decide where it fits into WQ.	MVCA MUNIC MNRF	X			X		X	X	
10. Encourage and support studies to determine environmental valuations for the ecosystem services and climate resiliency provided by natural asset features and functions (wetlands, woodlands, etc.).	Strongly supports water management and natural hazard responsibilities.	MVCA UNIVERSITIES PROVINCIAL & FEDERAL AGENCIES	X	X	X	X	X	X	X	X

DRAFT WATERSHED PLAN ACTIONS	RATIONALE	PARTNERS	GOALS SUPPORTED							
			1 collaboration	2 water quantity	3 natural hazards	4 water quality	5 climate change	6 growth &	7 natural systems	8 education
11. Work with municipalities and public agencies to improve the application and coordination of regulatory tools for the protection of wetlands, woodlands and natural systems. Including: • Support counties and municipalities in fulfilling Provincial Policy Statement (PPS 2020) requirements for Natural Heritage Systems. • Set measurable environmental targets.	A responsibility/ priority for municipalities with MVCA providing a support role. MVCA has resources to assist with data, information, mapping.	MVCA MUNCI MNRF MECP OMAFRA Shared leadership roles relative to legislative responsibilities	X	X	X	X	X	X	X	X
12. Develop and implement a 3 Year MVCA Stewardship Program Pilot for protection of water quality, wetland cover, forest cover, and other environmental features.	Focus has been on recreational water quality. Could be reassessed to support a broader function related to climate resiliency for watershed management.	MVCA STWDSHP GPS SECTOR CONTACTS AGRICULTURE, DEVELOPMENT & FORESTRY COMMUNITIES	X	X	X	X	X	X	X	X
13. Develop and implement an MVCA Education Strategy.	Can enhance/support both core and non-core programming	MVCA ALL PARTNERS	X	X	X	X	X	X	X	X

Mississippi Valley Conservation Authority

MISSISSIPPI RIVER WATERSHED PLAN

April 2021 – **Internal Draft**



Acknowledgments

Mississippi Valley Conservation Authority (MVCA) acknowledges that the watershed is situated on unceded traditional Omàmìwininì (Algonquin) territory and with this acknowledgement comes respect for the land, people and the unique history of the territory. And for the rights of the First Nation and Indigenous Peoples. We acknowledge the injustices of the past and those that continue today and we are dedicated to honoring Indigenous history and culture and committed to moving forward in the spirit of reconciliation and respect with all First Nation, Métis and Inuit people. (This and next section need to be reviewed by Cambium Consulting)

Indigenous Engagement

At the outset of this project, MVCA made a firm commitment to undertake meaningful engagement with Indigenous Communities in developing this Plan. This project has presented an ideal opportunity to work with the indigenous communities in developing a solid and mutually respectful relationship.

Early in the planning process MVCA undertook to have an Indigenous Engagement Plan (IEP) prepared under the guidance of Cambium Indigenous Professional Services. 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 may extend well beyond the planning phases of a project. Although the original intent of this initiative was to actively engage at the early stages and information packages were sent out, circumstances prohibited engagement opportunities,

Since this is a living document, that MVCA will continue to implement the IEP and the document will be adjusted as needed to reflect those outcomes.

Thanks

We would like to acknowledge the contributions of all those who participated in the development of the Mississippi River Watershed Plan. (May list people and/or groups)

Cover Image:

Executive Summary

Coming soon.....

Table of Contents

Note about the mapping: 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

CA – Conservation Authority
DFO – Department of Fisheries and Oceans Canada
EC – Environment Canada
IEP – Indigenous Engagement Plan
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

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.

The Mississippi Valley Conservation Authority (MVCA) is a watershed-based organization, established under the *Conservation Authorities Act*, 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. 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

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 connected set of streams and rivers that all drain into a single larger body of water, such as a larger 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.

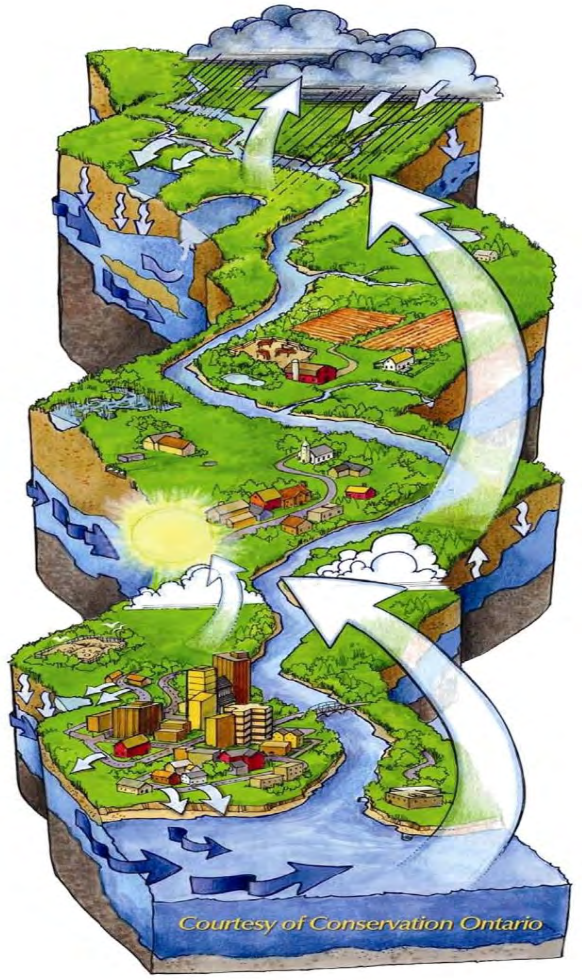


Figure 1: Diagram of Watershed Interactions

The Mississippi River watershed covers 3765 km^2 of land, spans 11 municipalities, and supports over 42,000 year round residents, and many thousands of seasonal residents. The health of the river and its watershed is vital to the health, social and economic wellbeing of its residents. It provides drinking water, replenishes wetlands and groundwater, provides essential habitat for fish and wildlife, supports recreation and tourism, provides water for agricultural crops and livestock, and is a source of hydroelectric power. As one of the largest river systems in eastern Ontario, the Mississippi River also supports a vast ecosystem made up of countless 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 (~20 year) direction with regular reviews and updates every 5 years.

Figure 2: Watershed Planning Process

The foundation of this Plan is a thorough understanding of, and appreciation for, the Mississippi River watershed from each of the environmental, social 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 & Identify Issues

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 the Mississippi River Watershed Plan.

Public Advisory Committee (PAC)

In Fall 2019, a Watershed Plan Public Advisory Committee (PAC) was formed by the MVCA Board of Dirctors. The PAC is comprised of 10 representatives from several 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 Committee members.

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.

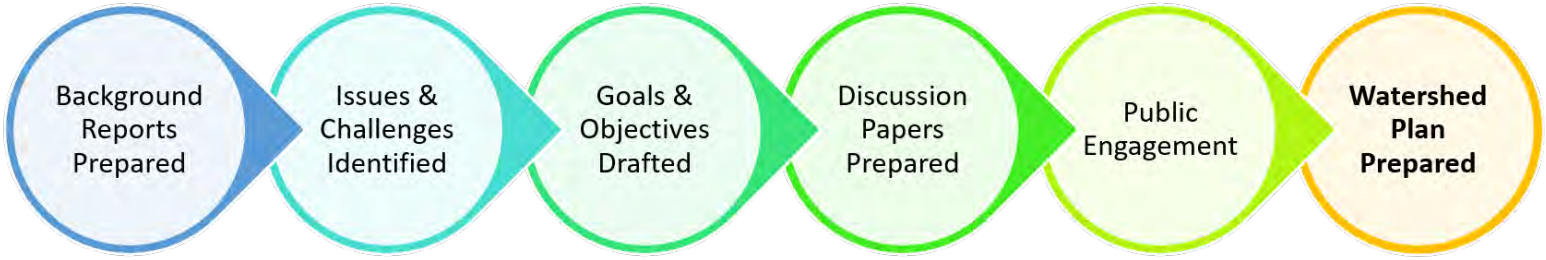
Indigenous Engagement

The engagement of indigenous communities is ongoing. An Indigenous Engagement Plan (IEP) is directing the form that engagement is taking, respecting the customs and needs of the indigenous people. This Plan will be updated to reflect the outcomes of this engagement.

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



Agency, Partner and Stakeholder Involvement	• Technical Review*	• PAC • MVCA Policy & Priorities Comm.	• PAC • MVCA BoD	• PAC • Technical Review	• All stakeholders	• MVCA Staff • MVCA BoD

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

Figure 3: Engagement Process - Steps & Stakeholder Involvement

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 to identify priority areas for action to address the issues and challenges that were idenitified. The stressors listed to the right are reflected in the listings of challenges presented in Section 3 of this document.

Discussion Papers

Building upon the Backgroundes, a series of Discussion Papers were developed to help stimulate public engagement discussions. The papers focus on eight themes: Agriculture, Growth & Development, Forestry, Municipal Infrastructure, Natural Systems, Tourism, Water Management, and Waterfront Properties. They presented general information about each topic and listed associated challenges and opportunites along with some draft actions to address identified challenges. A total of 33 strategic actions were identified and are presented under Section 3 of this Plan.

List of Key Watershed Stressors

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

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 use and manage both surface water and groundwater wisely to meet current and future needs under normal and extreme conditions.
3. To minimize risks to human life and property due to flooding, erosion, and unstable slopes and soils.
4. To sustain or improve current water quality for all users.
5. To increase our resiliency and adaptive response to climate change.
6. To support environmentally sustainable growth and economic development.
7. To maintain, enhance, or restore natural features and systems for all users.
8. To support learning and environmental stewardship.

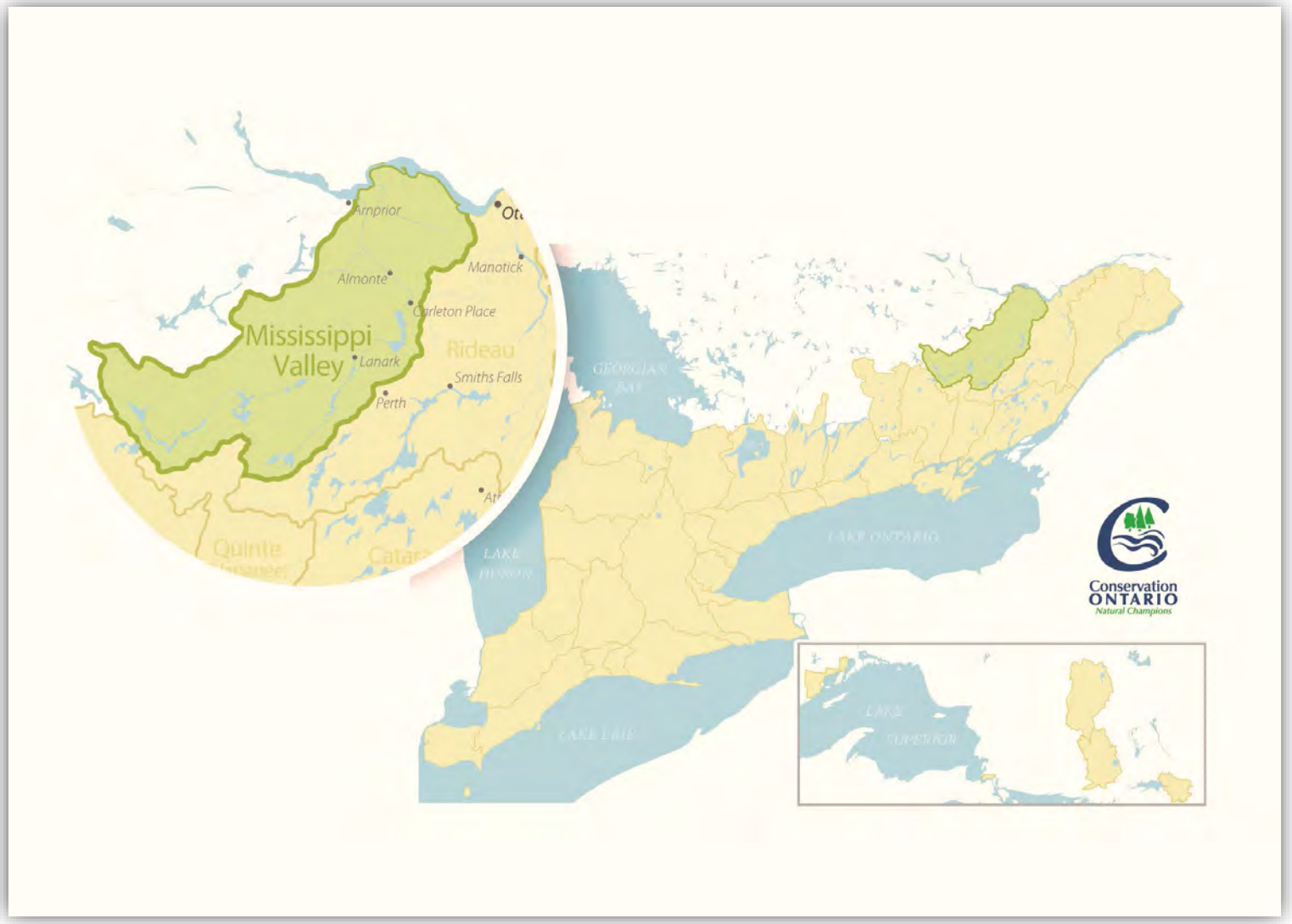
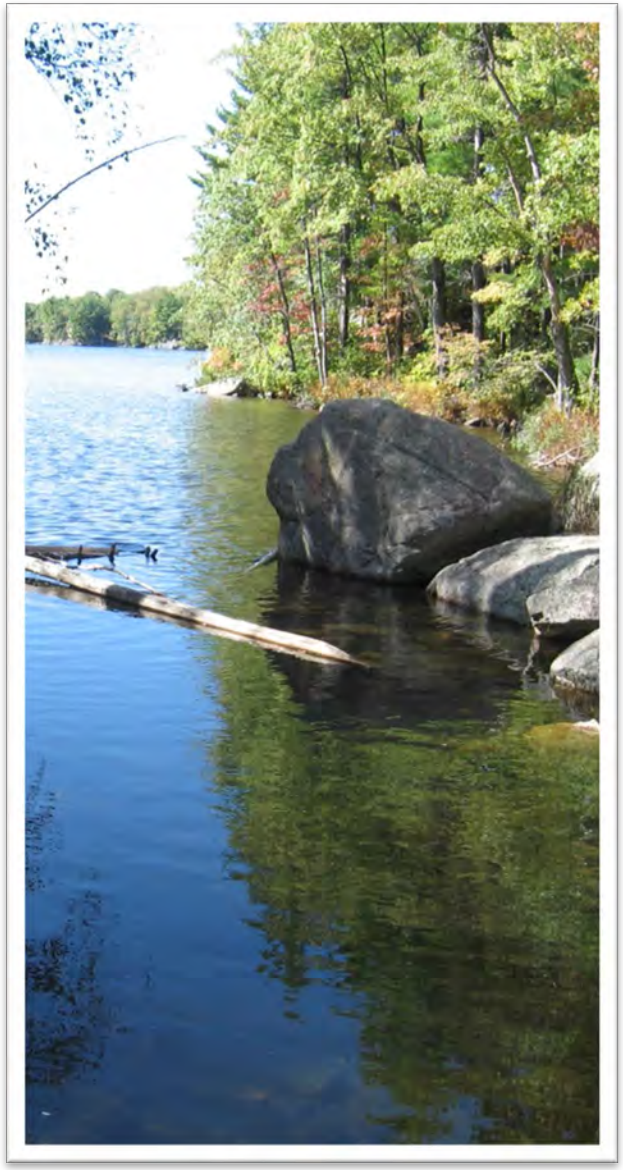


Figure 4: Location of the Mississippi River Watershed

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 km^2 in size and encompasses eleven municipalities serving the needs of its year round and seasonal residents, and various economic communities. It provides drinking water, habitat for humans, fish and wildlife, supports recreation and tourism, and provides water for agriculture and hydroelectric power.

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 is a rocky, hummocky landscape with thin soil cover and rock outcroppings, and many lakes and small wetland scattered throughout. The "Lowlands" area has a flatter topography with more soil and fertile lands, one lake and a number of large wetland areas. There is a blended transition area between the two, centred in the Mississippi Lake region.
The west part of the watershed with its rugged Canadian Shield retains most of its forest cover and wetlands, while the east watershed is characterized by urban settlement and

agricultural lands, with relatively limited remaining forest cover and fewer, but larger, wetlands.

Some key facts about the two regions are presented below.

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

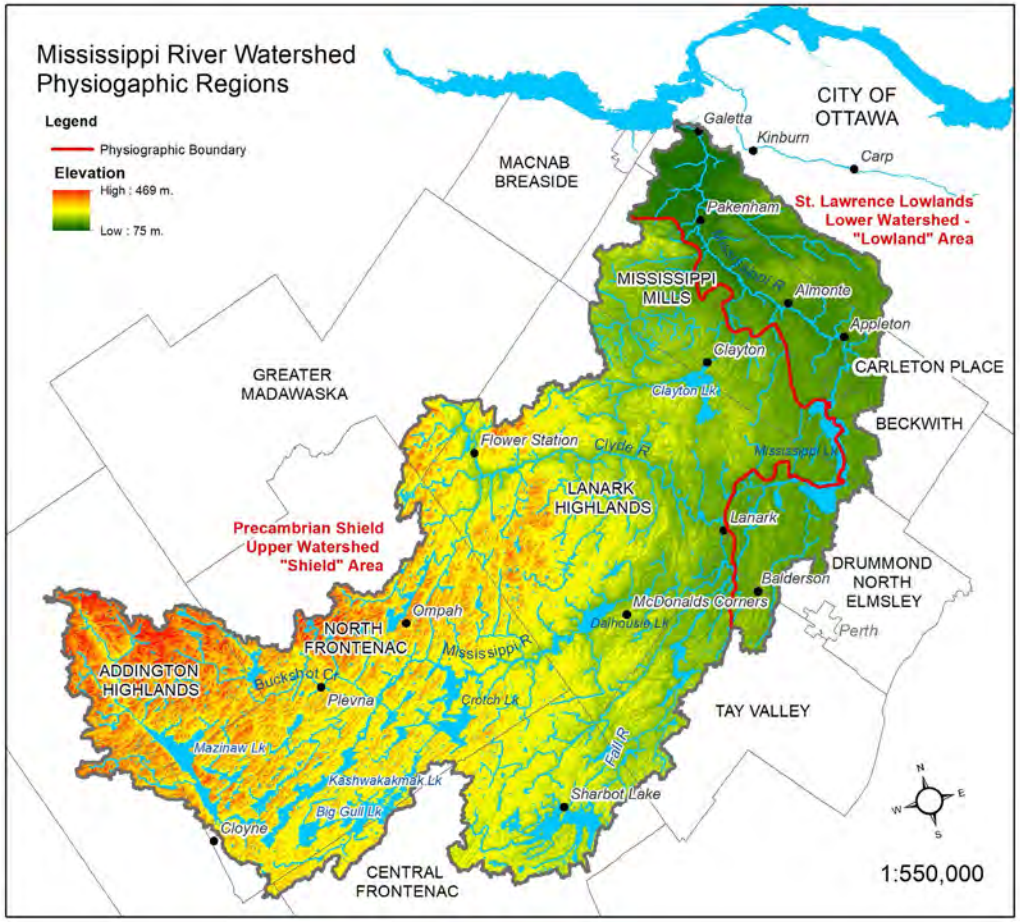


Figure 5: Physiographic Regions

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 key facts presented below.

Facts about the Natural Features and Systems

Mississippi River	212 km
Tributary length	>7100 km (includes smaller rivers, streams and creeks)
Number of lakes	>250, mostly west watershed (Shield Area)
Wetland Area	Entire watershed – 13% wetland; Shield Area 14%, Lowlands Area 12%
Woodland Cover	Entire watershed – 64% woodland; Shield Area 72%, Lowlands Area 31%
Forest Interior Cover	Entire watershed – 23% interior forest; Shield Area 27%, Lowlands Area 7%
Areas of Natural & Scientific Interest	22 ANSIs (13 Provincially Significant, 9 Regional, Local or Candidate)

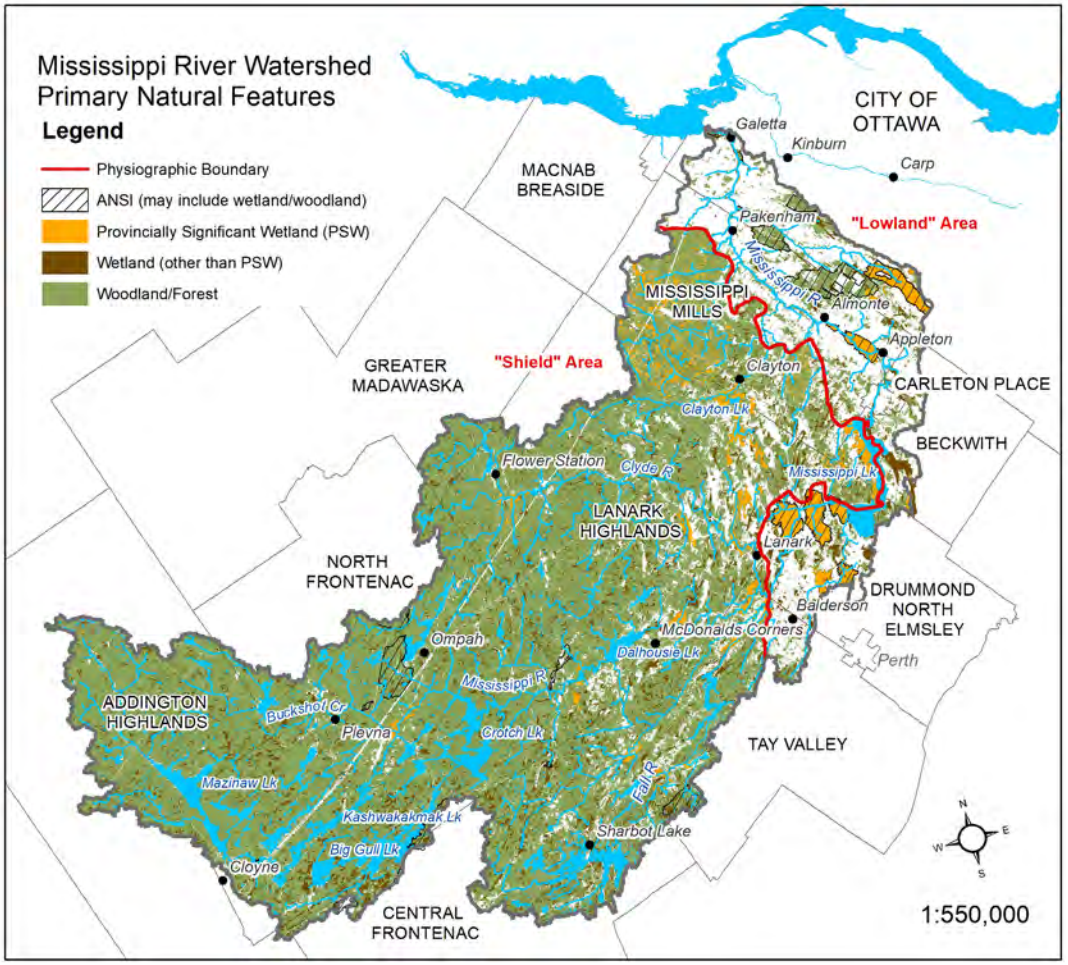


Figure 6: Key Natural Features

There are numerous other natural features that are not shown in Figure 10 including:

- **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:** cold water lakes and streams, and walleye and trout spawning areas 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.

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 United Empire Loyalists, and followed by immigrants from Scotland and Ireland. The watershed has supported decades of economic development largely focused around 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. 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 & Associates, 2014).

Some basic population and property facts are presented here. 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 population 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 period.

Population and Property Facts	
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)	31,3610
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

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 from five municipal wells. Carleton Place supplies drinking water from a surface water intake at its water treatment plant located 900 metres downstream of Mississippi Lake. 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 key land uses across the watershed, highlighting the differences between the Shield and Lowlands areas. This highlights 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 refers to lands that are owned by the province and managed by the Ministry of Natural Resources (MNRF) under the *Public Lands Act*. Crown land makes up 770 km² of land area, or 21% of the total watershed area. Except for the Burnt Lands Provincial Park near Almonte, the crown land is all located on the Shield part of the watershed.

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 that should be conserved over the long term.

The Province 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.

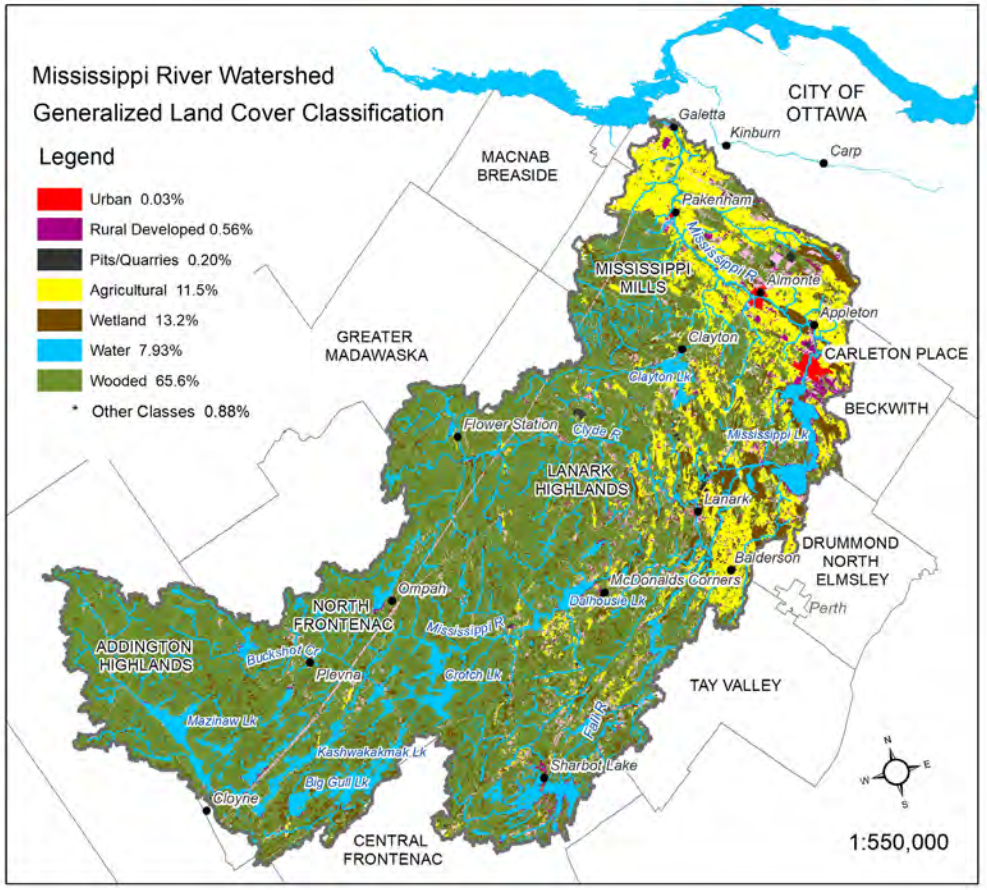


Figure 7: Generalized Land Cover

3 Actions & Strategies

This section identifies the strategies developed through stakeholder consultation to address the key issues facing the Mississippi River watershed. Three key themes and five program areas were identified. The key themes present overriding considerations that each influence all of the five identified program areas.

Key Overriding Themes

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

Program Areas

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

This part of the Plan is presented under 8 key headings that represent the three overriding themes and the 5 program areas. For each theme and program area, an overview provides: key facts; agency roles and resposibilities (where applicable); and watershed management considerations. For the program areas, a list of challenges is also presented. The challenges relevant to the overiding themes of Climate Change and Growth & Development are presented throughout the sections for each of the 5 program areas.

Watershed plan strategic actions are presented at the end of each section. For each strategic action, those agencies that have a role in the implementation of the strategy are listed under 'Partners'. The role of each partner will vary from strategy to strategy, ranging from being circulated for information, to funding partner, to action/program lead. Such roles will be established through discussions with relevant partners during subsequent implementation planning.

Integrated Management & 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.

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 policy direction for the various aspects of watershed management. 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 Tables 1 to 3 list those agencies that have a role in various aspects of watershed planning and the key documents and numerous legislations that provide those agencies the authority and/or tools to implement policy.

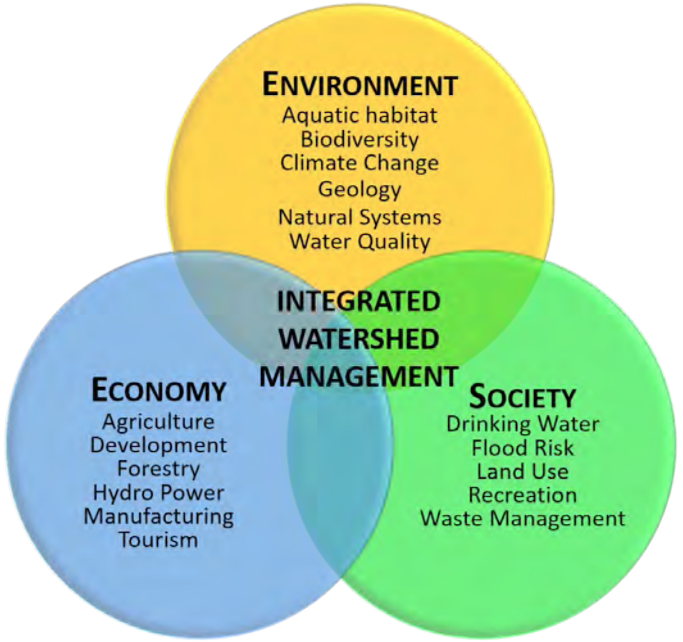


Figure 8: Factors in Integrated Watershed Planning

Watershed Partners

A watershed plan should reflect the shared values and priorities of 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 also produces 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 these issues. 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. See Appendix B for Tables 1 to 3 listing legislation and agencies.

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 about X% of the funding coming from the municipalities and the remaining X% from the province, fees for service, special levies, and grants.

MVCA also has agreement relationships with a number of agencies to provide delegated services. For example, 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. It 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 develop and strengthen relationships with First Nations communities that have a connection 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 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.

Collaboration Strategic Actions

Action No.	Actions/Strategic Directions	Partners	Implementation Considerations & Options
IMC1	Extend the role of the MVCA Public Advisory Committee (PAC) for the implementation and updating of the Watershed Plan.	• MVCA • All sectors and communities represented on the PAC (Pg. 4)	• May be made mandatory through 2021 changes to Conservation Authorities Act. • Will require a 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 • Indigenous Communities	• Indigenous Engagement Plan (IEP) has been prepared and is being implemented as this Plan is adopted. • Following completion of the IEP, the Plan will be reviewed and amended where needed and feasible, to incorporate indigenous considerations. • 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 and direct partnerships.	• MVCA • Lake Associations & Networks • Federation of Cottage Associations (FOCA)	• The North Frontenac Lake Association Alliance and The Lake Networking Group are key conduits to grassroots collaboration. • Collaborations can include: o Monitoring and stewardship initiatives o Educational workshops, materials and tools o Scientific research projects o Technical and advisory support in developing lake plans

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.

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 actions aimed at improving 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 local climate change adaptation initiative (Egginton, P. and B. Lavender. 2008). MVCA subsequently partnered with universities and others on a variety of research projects to undertake vulnerability assessments of:

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

The key projected local impacts are listed to the right, however this is by no means a complete list, as other interrelated impacts continue to become evident.
For the Mississippi River watershed, in addition to increases in average annual temperatures, climate change models project more frequent and extreme rainfall

Projected Local Climate Change Impacts

- Increased flooding and erosion, and early spring flooding
- More drought conditions and more frequent severe weather
- 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.

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 & 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 includes: o Further overall understanding of climate change impacts to watershed management goals through monitoring and research. o Determine needs and options for building local resilience, mitigation and adaptation. o Wherever possible, incorporate adaptive and mitigative measures in watershed management activities. o Seek ways with partners to promote enhanced carbon capture and reduced carbon footprint throughout the watershed.
Note: As a key overriding theme, many additional strategic actions presented further on in this document are directed at improved resiliency and adaptation to the impactions of climate change.			

Growth & 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 region 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 Pgs. 37 to 43 and Natural Systems Pgs. 44 to 50). 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, sewers and stormwater systems, water and wastewater facilities, roadways and culverts, and management of public lands. Drainage, and water supply and quality are key infrastructure concerns. The eastern municipalities are experiencing high growth and development, with increased drinking water, stormwater management and other servicing demands. Asset Management Plans and integrated infrastructure planning are also needed to ensure the integrity and appropriate sizing and operation of dam and municipal road structures, and drainage infrastructure.

Waterfront Development

Almost one third of the properties in the watershed are waterfront. The vast waterfront areas throughout the watershed 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 and the infill development of properties and areas formerly deemed unsuitable for development because of drainage concerns, Second tier (back lot) developments are also becoming more common.

Water Management Tools for Sustainable Growth & Development

- Protection of wetlands, for natural storage and other benefits.
- Riparian buffers along all waterways including natural features (lakes, rivers, stream), and manmade features (municipal and agricultural drains).
- A 30 metre setback from water 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 such as garages lie within the 30 m setback. Some municipalities implement grandfathering provisions allowing for intensification of existing development within the 30 m. setback. Much of MVCA's municipal plan review service focusses on reviewing applications for development within the setback area and trying to work with municipalities to limit further development in the setback areas and achieve a net environmental gain.

Where the development involves work at the shore or in the water, such as a dock or boathouse, 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. Confusion about regulations with regard to which agencies must be involved, and when and where the certain regulations apply, is an ongoing issue, and improvement is needed to ensure development review processes are timely, effective, and balanced.

Agriculture

Agricultural land is found throughout the watershed. Most is located in the lower watershed 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.

Urban and Agricultural Land Use around Almonte

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.

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 sustaining the health of the river by 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 & 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.). The industry depends on the sustained integrity of the lakes and rivers, shorelines, crown land and other natural areas, vistas and viewscapes. Local tourism is largely focused on the recreational opportunities provided by the many lakes, rivers, and vast areas of crown land, and 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.

As a largely outdoor recreation based industry, local tourism is vulnerable on a number of factors, both environmental and human-induced, 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 & wildlife health and populations, shoreline aesthetics/health, and the quality and availability of natural landscapes.

Growth & Development Strategic Actions

Action No.	Actions/Strategic Directions	Partners	Implementation Considerations & Options
GD1	Work with all partners to continue to support environmentally sustainable growth and development objectives on a watershed basis for the protection of watershed values and features.	• All Partners and Stakeholders listed throughout this Plan	• Key tools for environmental sustainability are: o the protection of wetlands, for natural storage and other benefits, o riparian buffers along all waterways including natural features (lakes, rivers, stream), and manmade features (municipal and agricultural drains), o the 30 metre setback from water structural development and hardened surfaces, o the implementation of low impact development measures (LIDs), o the protection of natural features and systems
Note: As a key overriding theme, many additional strategic actions presented further on in this document are directed at environmentally sustainable management of growth and development.			

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 Pgs. 42 to 48 for Water Quality)

The eleven local municipalities are responsible for a range of infrastructure including, roadways and culverts, sewers and stormwater systems, water and wastewater facilities, and management of public lands. Drainage, water supply and water quality are key infrastructure concerns. The

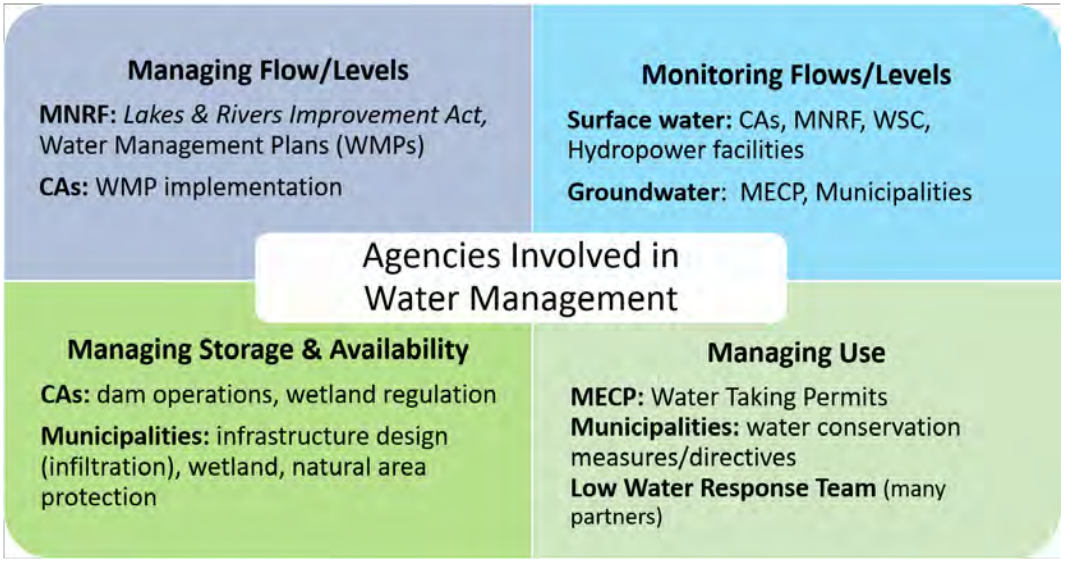


Figure 9: Water Management Agencies

eastern municipalities are experiencing high growth and development, with increased drinking water, wastewater and stormwater management and servicing demands.

The Mississippi River is a "managed system", with a series of water control structures (dams and weirs) that are used to manipulated 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 hydraulic structures along the river system.

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 throughout the watershed. Data is used to inform dam operations, flood forecasting and warning, conduct trend analysis, and carry out system planning and dam design.

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.

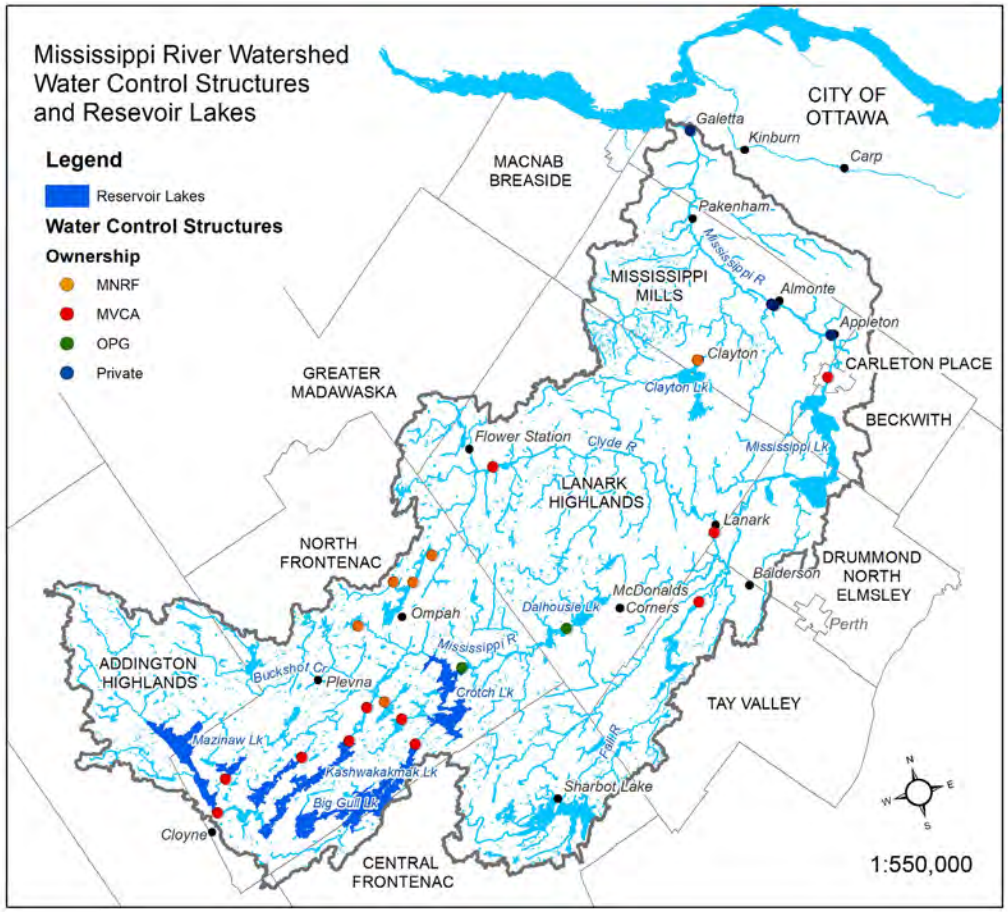


Figure 10: Water Control Structures & Reservoir Lakes

Stormwater Management

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

Under the *Drainage Act,* municipalities are responsible for stormwater management by ensuring proper drainage of new developments. For areas of high growth, master stormwater/drainage planning is needed to guide the management of drainage and stormwater at a wholistic 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 in terms of stormwater management. 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. 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. Its causes stress to forest, wetlands and aquatic environments, and stress for industries such as agriculture and tourism that depend on the availability of water. Under 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.

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 of 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

As watershed managers, water storage is a key building block to providing climate resiliency to mitigate the impacts of both flooding and drought. With limited capacity to store water in the "reservoir lakes" and through the manipulation of dams, the protection and creation of natural storage is increasingly important. Wetlands are a primary and the most obvious form of natural storage. They hold water during high water events/seasons and slowly release it back into the system when it is needed during low water events/season.

Studies show that wetlands left in their natural state can reduce the cost of flood damage by 29% in rural areas and 38% in urban areas. The University of Waterloo Intact Centre on Climate Adaptation (ICCA) assessed the potential for wetlands to affect the financial impacts associated with flooding in both rural and urban scenarios. Using models to simulate a major fall flood, it compared flood damages under conditions where wetlands were maintained in their natural state and where they were replaced with agricultural land use. (Moudrak, et.al. 2017).

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 wetlands (natural and constructed), and the use of permeable surfaces to replace 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:

- Improve water quality by providing natural filtration systems;
- Process nitrogen, produce oxygen and have a high capacity to sequester and store carbon;
- 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;
- 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 & 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.

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 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 residential and commercial demand for water, while the environment and economic sectors such as agriculture and tourism also depend on the availability of water.

Municipal Drainage Infrastructure

- Stormwater flooding - rainfall / snow melt overwhelms capacity of municipal drainage collection systems such as ditches, culverts and storm sewers.

Water Management Strategic Actions

Action No.	Actions/Strategic Directions	Partners (L: Lead)	Implementation Considerations & 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(L) • POWER • PRODUCERS • UNIVERSITIES • MECP • WSC	• Generate new climate change scenarios based on the upcoming IPCC Assessment Report.
WM2	Update the Mississippi River Water Budget to better evaluate water needs and use by completing the recommendations of the MRSPP Tier 1 budget assessment and incorporating climate change considerations.	• MVCA(L) • MECP	• 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. • Flow monitoring downstream of Appleton is recommended. Should this information become available, stress calculations should be performed again. • 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. • Assess past drought occurrences to determine impacts on river flow, and the conditions under which the target flows could not be achieved. • Use updated budget to define management objectives and set policy for the allocation or "use" of water. • 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 of both man-made (dams and reservoirs) and natural storage (wetlands) options and capacity.	• MVCA(L) • UNIVERSITIES	• 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. • Natural storage component could be done in-house or as a research collaboration with the academic community.
WM4	Update the Mississippi River Water Management Plan to build on modeling,	• MVCA (L) • MNRF(L)	• Review the findings of the 2015 MVCA Climate Change Implications for Small Waterpower Facilities study to assist in

Action No.	Actions/Strategic Directions	Partners (L: Lead)	Implementation Considerations & Options
	water budget and storage assessments completed under Actions WM1, WM2, and WM3 to assist in rebalancing the competing interests for the watershed's water resources where needed.	• Consulting with municipalities, and other major water users[2]	rebalancing the competing interests for the watershed's water resources.
WM5	Develop and implement an Asset Management Plan for the water control structures.	• MVCA(L) • MUNIC	• 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 increase automated monitoring capabilities and overall efficiency.	• MVCA • WSC Shared leadership roles	• Flow monitoring is needed downstream of Appleton. • Improve the efficiency and robustness of the system as new technologies come available. •
WM7	Work with municipalities, agriculture and development communities, landowners and other partners to quantify, value and protect wetlands as hydrologic and natural assets.	• MVCA • MUNIC • UNIVERSITIES • DEVEL & AGRI • NGOs Shared leadership roles	• Explore collaborations with academic community to undertake ecological/environmental valuation research. • Explore federal funding opportunities to support valuation research relative to climate change resiliency.
WM8	Work with municipalities, agriculture and development communities, and other landowners and partners to enhance on-site retention and infiltration of water.	• MUNIC(L) • MVCA • DEVEL & AGRI • NGOs	• Produce and deliver education and communication programming to demonstrate LID technologies for municipalities and developers. • Work with municipalities to determine strategies for the implementation at LIDs at both policy and planning approvals levels. • Direct stewardship programming to focus on on-site • retention/LID design and best management practices.

[2] Water users taking more than 50,000 liters of water per day who 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

Action No.	Actions/Strategic Directions	Partners (L: Lead)	Implementation Considerations & Options
WM9	Enhance response planning and readiness through the Low Water Response Team to address low water response and to ensure it includes representation from all key water use sectors. *(CA responsibility falls under Ontario Low Water Response Strategy).*	• LWRT(L) • MUNIC • MNRF	tbd
WM10	Support Hydro Producers and municipalities in undertaking an Ice Risk Assessment if deemed beneficial.	• MVCA • HYDR0(L) • MUNIC(L)	tbd

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: CA's full set of responsibilities specific to flooding are listed and described further on (Pgs. X to X).

The Provincial Policy Statement 2020 (PPS, 2020) is the key policy document for guiding the management of development in hazard land areas. 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 CA's 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 conduct review of 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 being equaled or exceeded 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 11). 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 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.

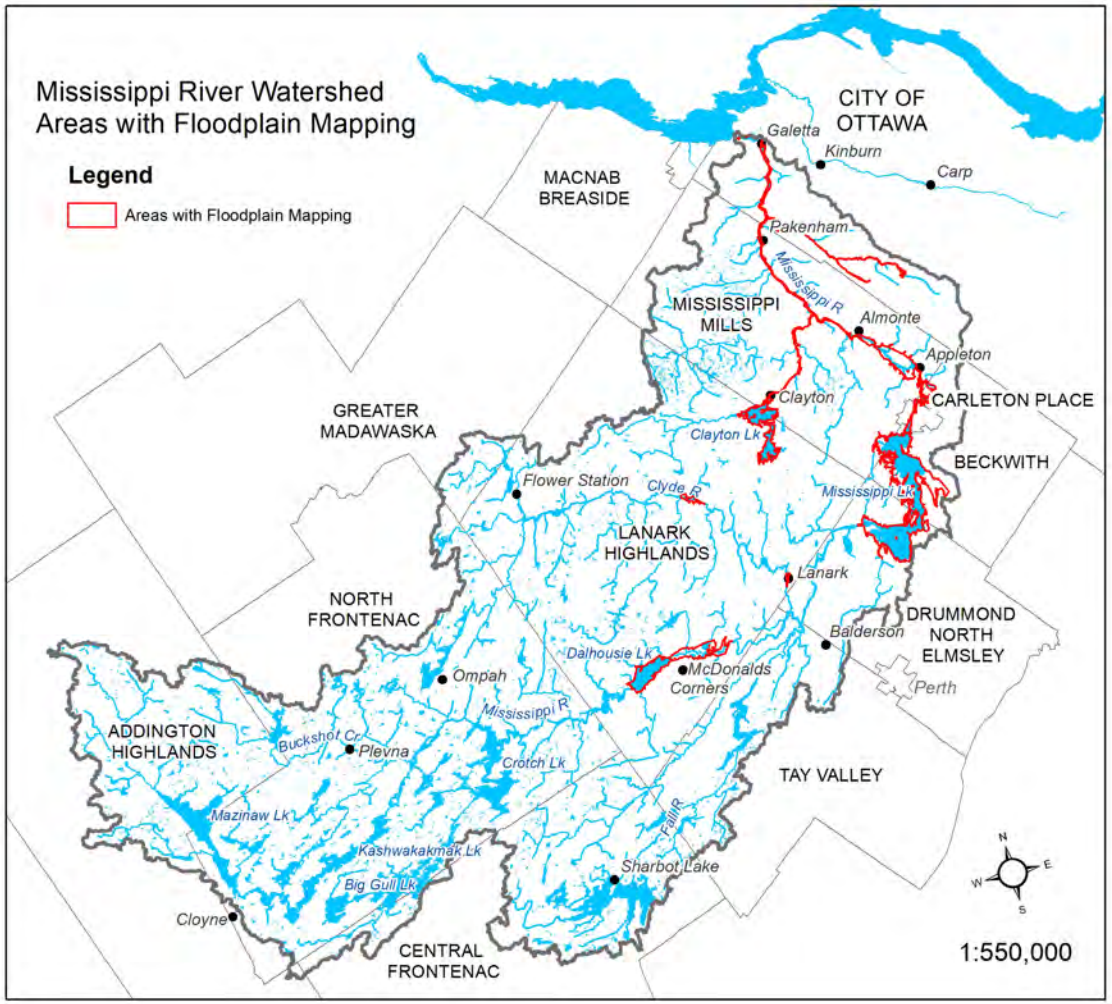


Figure 11: Areas with Floodplain Mapping

Slope, Erosion and Unstable Soils Hazards

The Mississippi River watershed also has areas that are susceptible to erosion from river undercutting and to slope and soil instability, due to the presence of sensitive marine clays (Leda type clays) and other unstable or highly erosive soil types (sandy or silty soils). 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, outside of the floodplain hazard mapped areas are not captured 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 29 to 36 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, weather data, and modelling to predict flood events. Enhanced modeling 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.

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 modeling 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

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 mean there are 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 Pgs. X to X

Regulatory floodplain and flood proofing standards

- The original 100 YR 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; can also cause environmental impacts if designed incorrectly; water management conflicts.

Natural Hazard Strategic Actions

Action No.	Actions/Strategic Directions	Partners (L: Lead)	Implementation Considerations & 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(L) • MNRF • MUNIC	• Work with the province and municipalities to provide updated LiDAR imagery every 10 years. • Mapping updates should not exceed 20 years.
NH2	Work with MNRF to assess and update current floodplain standard (100 Year), policies, and floodproofing measures to address conditions under typical and extreme events.	• MVCA • MNRF(L) • MUNIC	• Encourage, and where practical, support the province in carrying out the recommendation of the Ontario's Flooding Strategy, 2020 • Consult with municipalities regarding known inefficiencies in current floodproofing standards (i.e. evidence/documentation of structures and road affected 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(L) • MUNIC	• Following assessment, work with municipalities to develop a strategy to address provincial requirements for safe access.
NH4	Develop an approach to identifying and mitigating potential risks associated with unstable slopes and unstable soils throughout the watershed.	• MVCA(L) • MUNIC • MNRF	• Undertake preliminary mapping to identify those areas where unstable slopes are likely to occur based on soils, vegetation, etc.
NH5	Support waterfront property owners in implementing adaptive management measures to address potential impacts of variable water levels.	• MVCA (L) • WATERFNT OWNERS & GROUPS • MUNIC	• Develop educational materials about adaptative measures for waterfront living (ex. removable vs fixed docks, enhanced deep rooted shoreline vegetation to resist erosion) • Work with water recreation based businesses, lake associations and municipalities to implement shoreline adaptive management measures.

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.

Safe drinking water, from both surface and groundwater supplies, is critical to human health. The water quality of the lakes and rivers are also critical to local 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. MNRF is responsible for water quality as it relates to the protection of fish populations and fish habitat.

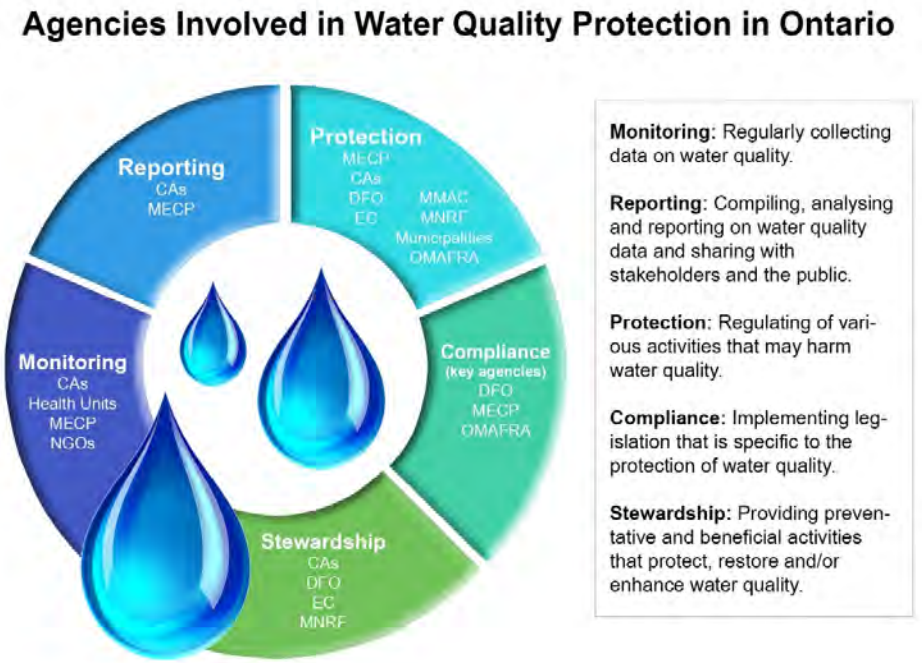


Figure 12: Agencies Involved in Protecting Water Quality

Other agencies including Fisheries and Oceans Canada, 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 below lists the water quality monitoring programs taking place within the watershed. MVCA's monitoring and reporting focusses 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 provincial programs (MECP) 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 parameter measures 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.

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 & stream characterists	Stream sites throughout the watershed
Provincial Water Quality Monitoring Network (PWQMN)	MECP	River water chemistry and parameters	11 stations
Provincial Groundwater Monitoring Network (PGMN)	MECP	Groundwater level & general chemistry	8 wells measure continuous water levels Annual water quality testing
Beach Water Quality Monitoring	Public Health Units	Total Coliform E.coli	Testing at public beaches
Private Well Water Testing Program	Public Health Units	Total Coliform E.coli	Free bacteriological testing of well water to private residents
Citizen Science Programs	various	Lake water quality	MECP Lake Partner Program Water Rangers Lake Associations

Key tools for the protection of water quality include:

- A 30 metre development setback from water.
- 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 depth.
- Protection of wetlands which filter pollutants.
- Proper installation, operation and maintenance of septic systems to prevent leakage into groundwater and surface water supplies.
- 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 Meter Water Setback are so Important

A riparian buffer is a vegetated area (a "buffer strip") next to a stream, river of lake, usually forested, which help 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 water 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. These are implemented through the municipal plan review process and MVCA Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation.

Riparian buffers extending 15 metres from shore, and the 30 metre setback are the two most effective tools in providing multiple benefits to a range of watershed management goals.

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 dues 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.
- Limited uptake of septic reinspection programming due to funding and property rights concerns.

Water Quality Strategic Actions

Action No.	Actions/Strategic Directions	Partners (L: Lead)	Implementation Considerations & 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(L) • 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 MVCA and municipal source water protection requirements.	• MECP(L) • MVCA • RVCA • MUNC • HEALTH UNITS	• Undertake a groundwater data needs assessment to determine whether current monitoring meets MVCA and municipal requirements for their obligations for Source Protection. • Where needed, work with MECP to address identified deficiencies. • 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. •
WQ3	Continue to support municipalities in actions prescribed by the Mississippi-Rideau Source Protection Program.	• MVCA-SPA(L) • MUNIC(L) 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.) • Work with the Town of Carleton Place to ensure expansions of its water and wastewater facilities can address water supply/demand, and quality requirements relative to growth and climate change. • Work with MVCA Source Protection Authority to review the implementation/effectiveness of the MRSPP best practices guidelines and education/outreach initiatives with respect to rural areas. • 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	• MUNIC(L) • MVCA • DEVEL	• Continue to provide to municipalities stormwater management advisory services for new development, to mitigate flood impacts and to provide water quality control to the receiving water bodies.

Action No.	Actions/Strategic Directions	Partners (L: Lead)	Implementation Considerations & Options
	new and existing developments.		• 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. • 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 • MUNIC • MECP • MNRF	tbd
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 area such as waterfront and rural settlement areas.	• MUNIC(L) • MRSSO(L) Shared leadership roles	• Requires willingness and support, both political and financial, by the municipality. • Voluntary programs are easier to implement at the outset. • Mandatory programs have been implemented in parts of Central Frontenac and Tay Valley Township, where there has been a demonstrated public support within a lake community.
WQ7	Review existing and potential environmental monitoring programs and identify opportunities for improvement/collaboration. (Including MVCA, Provincial, NGO and Citizen Science programs/opportunities).	• MVCA • MECP • OTHER GOVNT • NGOS • CITIZEN SCIENCE • ETC.	• Examine the potential need for a baseflow monitoring network to measure baseflow conditions at key locations throughout the watershed. • Consider realigning monitoring programs, where needed to: o address climate change detection and assessment needs(i.e. support vulnerability and impact assessments); o facilitate “state of the watershed/subwatershed” trend analysis and reporting, and environmental target assessment; o support nutrient and ecological modelling and other research initiatives.

Action No.	Actions/Strategic Directions	Partners (L: Lead)	Implementation Considerations & Options
			• 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 presented at a subwatershed scale and adjust reporting cycles, parameters, and geographic coverage where needed.	• MVCA(L)	• Continue to use the Watershed Report Card five-year reporting cycle to monitor changes in wetland and forest cover conditions and to measure against Environment Canada and other relevant targets. • Continue to produce Integrating Monitoring Reports at the subwatershed scale.

Natural Systems & 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 is characterized by 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 and the municipalities are responsible for the protection of natural features and systems by implementing the policies of the *Provincial Policy Statement (PPS, 2020)* 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 for the regulation of development in and adjacent to wetlands.

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 aquatic ecosystem.

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 (Chu. C, 20XX).

Forests

Under Section 2.1 of the PPS (2020), municipalities are required to identify and protect significant woodlands in Eco Regions 6E and 7E. 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 % forest cover, 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.

Areas of Natural & 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 EcoRegion 6E. 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, ad 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

The Mississippi River watershed benefits 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 primarily in the west. 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 and 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 by Environment Canada. 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 and the Managed Forest Tax Incentive Program (MFTIP) assists property owners in sustainable harvest and management of their woodlots. 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.

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 formal application process.
- Tools difficult to implement, monitor and enforce.
- Many of the features are on private lands, with a reliance on education and outreach to encourage the 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

- Historic and continued loss in east watershed and along waterfront;
- The Lowlands area falls below the EC(2013) minimum targets with 29% cover and 6% interior habitat;
- Lack of natural corridors and linkages between the woodlands and other natural areas;
- 70% or forested lands in private ownership where regulatory tools for managing harvest are limited.

Areas of Natural & 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 & Land Conservation Strategic Actions

Action No.	Actions/Strategic Directions	Partners (L: Lead)	Implementation Considerations & 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(L) • MNRF • MUNIC • AGRICULTURE, DEVELOPMENT & FORESTRY COMMUNITIES • LAND TRUSTS • OTHER CONSERVATION GROUPS	• Work with the province, municipalities, agricultural community, development & forestry communities, and other owners of large land holdings in maintaining and improving climate and ecosystem resilience through: • programs and incentives for woodland protection and reforestation, • wetland protection and creation, and • low impact development, with a focus on enhancing on-site retention and infiltration of water. • 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 areas. • 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. • Adopt a Natural Heritage Strategy for the east Lowlands area to achieve minimum targets: wetland cover of >30%, forest cover of >30%, and forest interior >10%. • 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. • Support the promotion of land trusts as a means of protecting natural features and systems. • 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 to determine environmental valuations for the ecosystem services and climate resiliency	• MVCA • UNIVERSITIES	tbd

Action No.	Actions/Strategic Directions	Partners (L: Lead)	Implementation Considerations & Options
	provided by natural asset features and functions (wetlands, woodlands, etc.).	• PROVINCIAL & FEDERAL AGENCIES	
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 • MUNCI • MNRF • MECP • OMAFRA 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. • 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. • 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.

Education & 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 through 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.

> "In the end we will conserve only what we love;
> we will love only what we understand and
> we will understand only what we are taught"
> -Baba Dioum

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 and 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 no formal 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 (>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 are sharing 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 has used a variety of communication tools to share information and knowledge for a range of audiences. Some communications have been quite effective and others less so. 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 events** – workshops, trade show displays, and stewardship initiatives.

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 a 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) also result in a "preaching to the choir" scenario and can tend to miss the target audience.

Education & Outreach Strategic Actions

Action No.	Actions/Strategic Directions	Partners (L: Lead)	Implementation Considerations & Options
EO1	Develop and implement a 3 Year MVCA Stewardship Program Pilot for protection of water quality, wetland cover, forest cover, and other environmental features.	• MVCA • STWDSHP GPS • SECTOR CONTACTS • AGRICULTURE, DEVELOPMENT & 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 • Work with Stewardship Council (s) to review current stewardship programs, to determine stewardship needs, and programming overlap and gaps. • 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. • 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.
EO2	Develop and implement an MVCA Education Strategy.	• MVCA • 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). • Include a Communications Strategy to raise awareness and understanding about watershed values, functions, issues and solutions, through enhanced communications and messaging. • Consult with specific communities (agriculture, development industry, indigenous community, lake communities, etc.) to determine tailored strategies for effective communication and messaging • Investigate opportunities to create Stewardship/Best Management Demonstration Projects at MVCA properties (Administration Centre and Conservation Areas) or other public properties (municipal lands).

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Appendix A: Record of Engagement

In Feb/Mar 2021the following communications tools were used to engage community and stakeholder engagement, using the Discussion Papers described on Page 5 as the basis for discussions. The list of groups and community 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

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 Lenox & Addington
Renfrew County
City of Ottawa
Township of Addington Highlands
Township of Beckwith Township
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

Non-Government (organizations and individuals)

Lake Associations & Lake Networking Groups

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 & Crop Assoc. Lanark

Conservation & Environment Groups

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

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 & 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 • Allows for construction and maintenance of flood and erosion control structures • 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 or rural drainage works • Provides legal mechanism where riparian landowners can drain their lands and divide the costs among themselves	OMAFRA, municipalities
Lakes and River Improvement Act	MNRF	• Empowers MNRF to regulate the construction and operation of water works • 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 • Authorizes power generation projects on crown land	MNRF
Municipal Act	MMAH	• Allows municipalities to enact bylaws for the construction, repair and maintenance of drains • Prohibits the injury or fouling of drains in rivers • Empowers municipalities to pass bylaws governing the construction and maintenance of dams and the straightening of water courses for flood protection	Municipalities, MMAH
Public Utilities Act	MMAH	• Empowers municipalities to acquire and operate water works and divert a lake on 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 liters of water in a day from a ground or surface source of supply • 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 • Requires the issuance of a permit for the construction of a well • 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

Federal Legislation			
Fisheries Act	DFO	• Protects fish habitat by prohibiting habitat disturbance • 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 • 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

Table 2: Key Legislation Related to Water Quality

Legislation	Administering Agency	Description	Implementing Agency
Provincial Legislation			
Conservation Authorities Act	MNRF	• 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 • Allows surveillance and monitoring of all surface and ground water in Ontario • Regulates sewage disposal and controls water pollution • 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 • Prohibits discharge of any substance likely to impair the environment • 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
Clean Water Act, 2006 (and Source Protection Plans)	MECP	• Result of the Walkerton Inquiry to address drinking water safety • Ensures communities protect their drinking water supplies through prevention - by developing collaborative, watershed-based source protection plans • Established source protection areas, source protection regions	CAs (technical support) Municipalities (Source

Legislation	Administering Agency	Description	Implementing Agency
		• 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. • Identifies municipalities as the implementers and enforcers of the plans.	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
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

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

Legislation	Administering Agency	Description	Implementing Agency
Provincial Legislation			
Endangered Species Act		•	
Fish & Wildlife Conservation Act		•	
Planning Act	MMAH	• Provides for and governs land use planning • Deals with provincial administration in land use planning and local planning	Municipalities, MMAH

Legislation	Administering Agency	Description	Implementing Agency
		• Requires that decision affecting planning matters be consistent with statements of provincial interest issued under the Act to be regarded in the planning process	
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 • Exempts lands and mining rights from taxes	MNDMF, MNRF
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
Federal Legislation			
Fisheries Act	DFO	• Controls the erosion and sedimentation for the purpose of fish habitat preservation	DFO, MNRF
Species at Risk Act		•	

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