Crowe Valley Conservation

Watershed-Based Resource Management Strategy

Approved by Board of Directors:
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Legislative Background

Conservation Authorities were created in 1946 by an Act of the Provincial Legislature. The Crowe Valley Conservation Authority (CVCA) was formed on November 6, 1958. Its purpose and goals focused primarily on water management, flood forecasting and warning, monitoring, conservation of land for public education and recreational usage and general education and outreach initiatives.

The Conservation Authorities Act and accompanying regulations have been amended by the Province of Ontario since 2017, including the following change made in 2021 to Section 20 of the *CA Act*.

As per Section 20

1) *The objects of an authority are to provide, in the area over which it has jurisdiction,*
(a) *the mandatory programs and services required under section21.1;*
(b) *any municipal programs and services that may be provided under section 21.1.1; and*
(c) *any other programs or services that may be provided under section 21.1.2. 2020, c.36, Sched. 6, s.6 (1).*

CA programs and services are categorized as follows per legislation:

- **Category 1**: Mandatory programs and services
- **Category 2**: Municipal programs and services provided on behalf of a municipality
- **Category 3**: Programs and services advisable by the CA to implement in the CA's jurisdiction.

Ontario Regulation (O. Reg.) 687/21 and Sections 21.1.1 and 21.1.2 of the Conservation Authorities Act established a requirement for Transition Plans (including a Program and Service Inventory) and Agreements to carry out CA Programs and Services.

O. Reg. 686/21 sets out the mandatory programs and services which must be delivered by CAs in Ontario. Specifically, section 12(1)3 of the regulation requires all Conservation Authorities to prepare a "Watershed-based Resource Management Strategy" ("Watershed Strategy").

The Watershed Strategy includes Category 1 programs and services provided by the CA. It may also include both Category 2 and Category 3 programs and services, where the relevant agreement permits the inclusion of these programs or services in the Watershed Strategy. Sections 12(4)-(7) of O. Reg. 686/21 set out the required components to be included in the Watershed Strategy.

The Crowe Valley Conservation Authority Watershed

The Crowe River watershed drains approximately 2006 square kilometers in eastern Ontario and is comprised of three primary sub-watersheds: the Crowe River, North River and Beaver Creek. The headwaters begin just north of Paudash Lake, which is situated just west of Bancroft and flows primarily due south for about 75kms and then empties into the Trent River north east of Campbellford. The major tributaries to the Crowe River are from the North River and Beaver Creek, both running somewhat parallel to the Crowe before joining in the southern portion of the river. The watershed is also a "true" watershed, as it is a well defined watershed with all of the water features truly connected to each other.

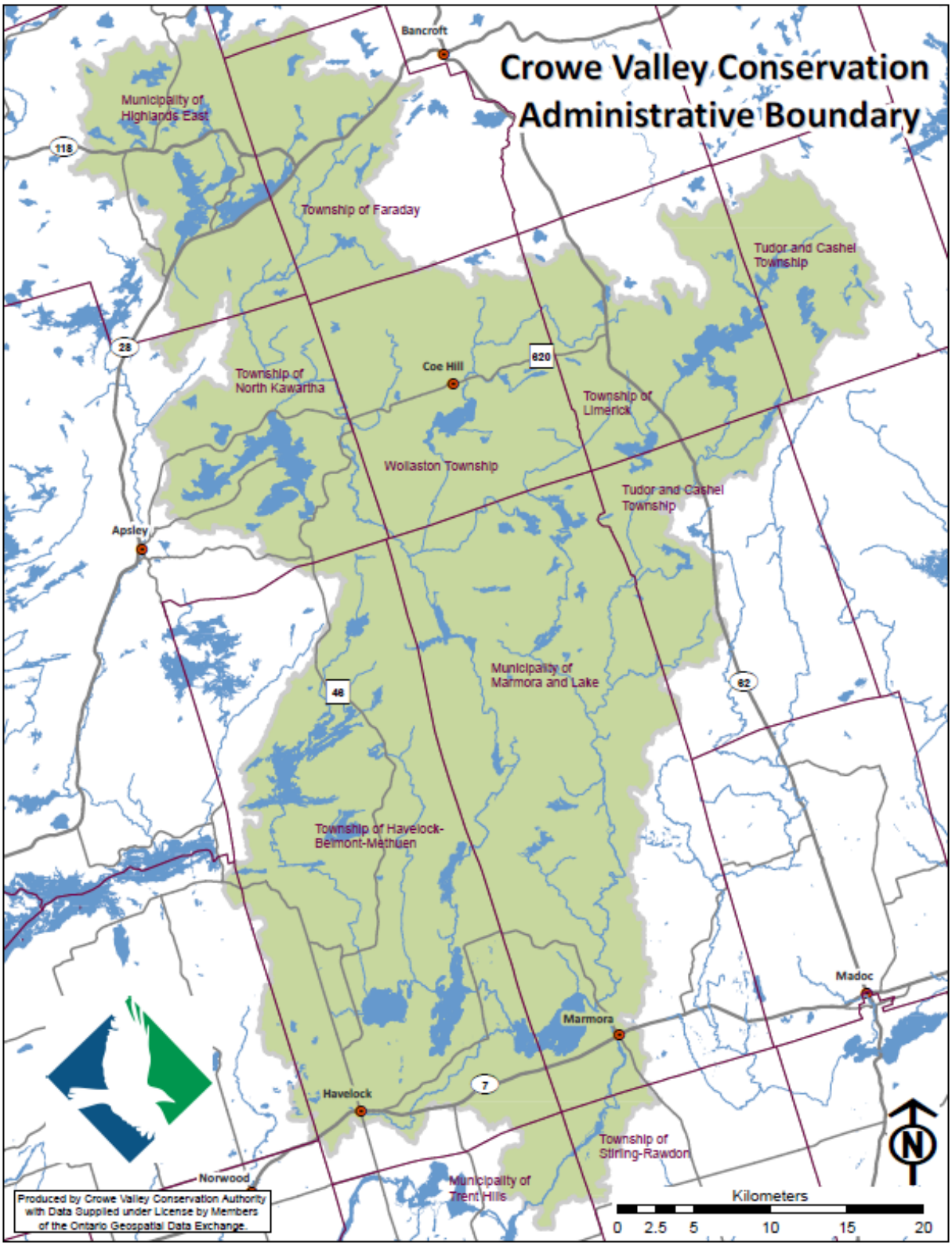
The watershed is primarily comprised of Canadian Shield with the very southern portion of the watershed dominated by the St. Lawrence Lowlands. The Canadian Shield is generally of low relief, forming a larger dissected plateau with low rounded hills and ridges and numerous lakes, streams and wetlands. In contrast to the Canadian Shield, the St. Lawrence Lowlands is a limestone plain which is relatively flat and covered with a variety of land forms superimposed on it by the deposition of material through glacial action. These geographical features also result in a "land between" scenario as the lowlands transition into the shield, thereby creating a unique landscape and conditions for plant and animal species that have adapted to both characteristics.

With limited development in the watershed, it is also dominated by lakes, streams, wetlands and forest cover, which is undisturbed natural habitat capable of supporting a thriving ecosystem of plants and animals.

However, there is limited agriculture and other human activities (one mining company) chiefly confined to pockets primarily in the very southern portion of the watershed.

The CVCA watershed has a very low population in comparison to every other conservation authority in Ontario. There are approximately 10,000 residents in the watershed. This is a mixed blessing, as the low population means less disruption to the watershed and the natural ecosystem. Unfortunately, this hampers the CVCA's revenue streams and as a result the CVCA has not been able to offer services and programs to augment the basic framework established by the *Conservation Authorities Act* introduced in 1946 through to recent changes.

Map 1: CVCA Administrative Boundary



Watershed Challenges

Human Activities

The Crowe River watershed is a diverse and interconnected system with little alteration by human activities or development. However, with the Ontario population expected to continue to increase, there will be additional pressures on the watershed not only as a recreational destination, but as a location to live and recreate. This growth will place additional pressure on the lakes, rivers, streams and wetlands, which results in additional pressure on the floodplain and the health of each and every water feature.

When development occurs within a natural hazard such as the floodplain, not only is this development and the people inhabiting it at risk of harm, but it also degrades the ability of the entire watershed to mitigate and recover from extreme weather events such as flooding. Development that occurs within the floodplain alters the flood storage capacity of the watershed. Everyone needs to remember, water must go somewhere in a flood, therefore development that is allowed to take place within the floodplain displaces floodwaters, putting other residents and their property, as well as the natural environment, at a greater risk of being negatively impacted by this natural hazard. Regardless of the amount of a floodplain of any waterbody that is filled in, it doesn't mean it vanishes, it literally means it will end up expanding the floodplain elsewhere in the lake, river, stream or wetland.

A similar relationship is true of erosion hazards, the more development that is allowed to occur within an erosion hazard, the greater likelihood of more frequent and intensified erosion. The CVCA works to prevent unregulated development from taking place within natural hazards such as flooding and erosion hazards in order to preserve the natural resiliency of the ecosystems in the watershed. This helps to prevent the cumulative degradation of these ecosystems which can pose extreme risks to community members throughout the watershed.

Regulating development is a preventative measure to address flooding concerns in the watershed. Water management and flood forecasting are measures taken to assess and react to flooding concerns in the watershed. These services work in tandem to protect the communities within the Crowe Valley watershed from the threats posed by flood events. The regulation of development to prevent the degradation of the flood storage capacity of the watershed preserves the watershed's natural ability to mitigate flood events. If unregulated development is allowed to occur within the floodplain this natural ability to mitigate flooding will be negatively impacted and the ability of the CVCA to manage levels and flows will become increasingly difficult, requiring more time and effort, weakening the CVCA's ability to manage and mitigate flooding.

Risks - Flooding and Drought

Floods can occur in all seasons, especially during the spring freshet (melt), following major rainstorms at any time of the year and during events like an unexpected winter thaw.

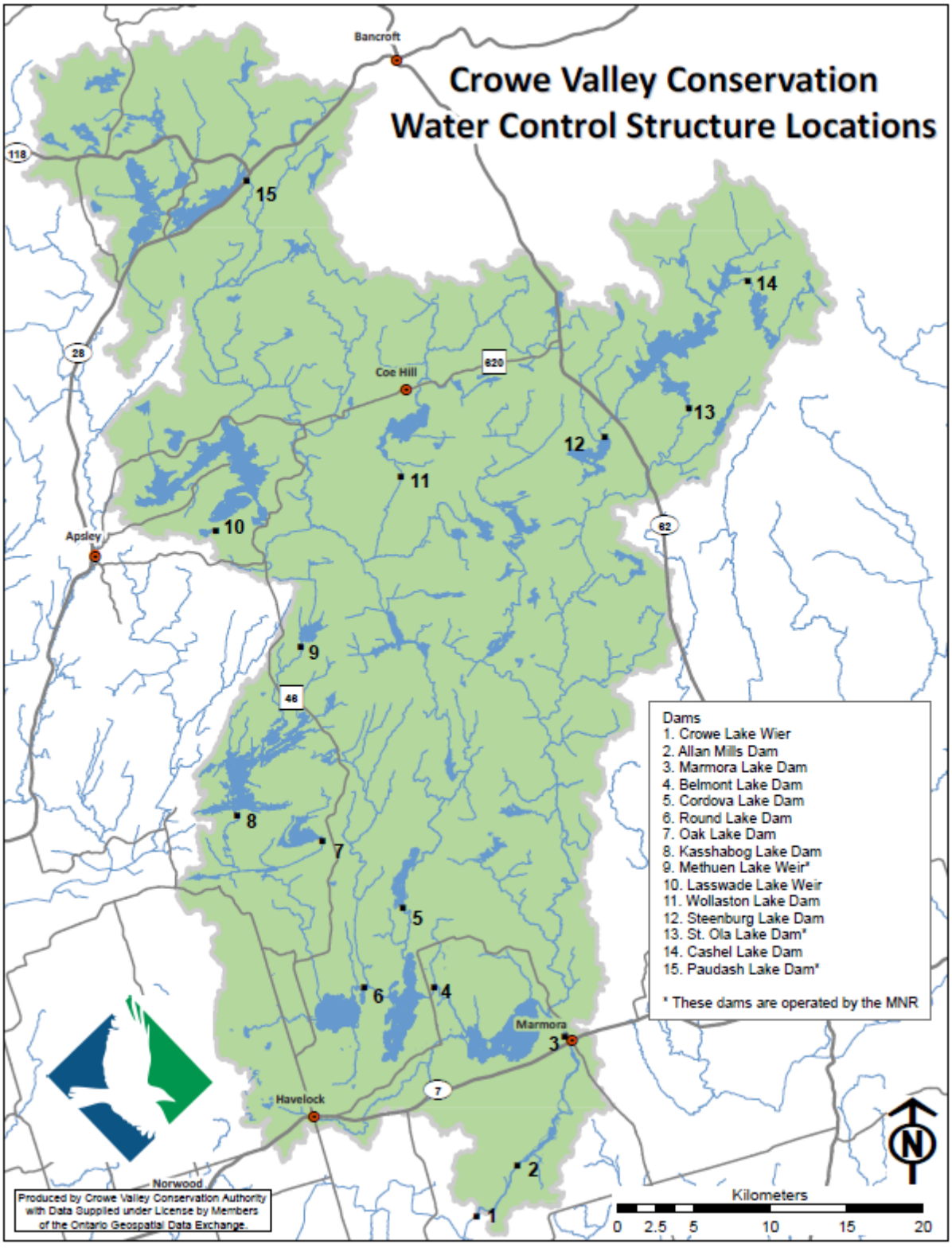
The CVCA operates dams throughout the watershed 365 days a year if necessary to mitigate the effects of flooding, thereby protecting people's lives and property. While efforts are made each and every time

there is a flood event, the risk of damage from a flood will exist. As well, the complexities of climate change may alter the frequency and severity of flooding experienced by those living along the lakes and rivers in the watershed.

There are no reservoir lakes in the watershed to augment drought conditions. However, the CVCA does spearhead a Low Water Response Team comprised of municipal, provincial and other various public and private representatives to guide all stakeholders during a drought. A drought scenario will often last longer than a flood and requires recommendations be made to all water users to assist with adapting to the extremely dry abnormal conditions.

Regardless of the condition the watershed is in at any given moment (flood, drought, normal seasonal water levels), the CVCA operates the dams in a manner that is balanced and as fair as possible for all users along the watershed's tributaries.

Map 2: CVCA Water Control Structures



Watershed-Based Resource Management Strategy Guiding Principles

The future health of the Crowe Valley Conservation Authority watershed, its economic viability and the sustainability of human interactions on the landscape depends on maintaining or improving the natural ecosystem of the wetlands, rivers, lakes and tributaries. This fundamental principle must be acknowledged, acted upon and be financially supported now and for the long term future.

As determined at the inception of Conservation Authorities, the watershed based model is the correct tool for managing water, especially when considering the Crowe watershed has been in existence for thousands of years. Human interactions have been ongoing since the appearance of Indigenous communities in the Crowe watershed. Only since the introduction of European settlers has the Crowe felt any development pressures and fortunately, these interactions with human goals and objectives have been considerably less than in other watersheds in Ontario. Therefore, the Crowe watershed has remained almost entirely in its natural state, maintaining a healthy ecosystem functioning as it should, with the lakes, rivers, wetlands and all of its tributaries as the backbone of the watershed. Large and diverse natural areas make the watershed more resilient, especially as this watershed faces an uncertain climate change future.

Sustaining or even improving the conditions of an ecosystem of this magnitude with all of the complexities involved will require collaboration and it must be a shared responsibility amongst all of the stakeholders, including the CVCA, its member municipalities, government agencies, its residents and even visitors to the watershed.

Provincial population increases and other threats such as climate change will undoubtedly exert pressure on the Crowe watershed. Managing this existing and emerging issues will be critical for all who live, work and recreate here. Therefore, a Watershed-Based Resource Management Strategy (WBRMS) will be key to address the mandate of the Crowe Valley Conservation Authority under the auspices of the *Conservation Authorities Act*, watershed issues and municipal requirements.

Objectives

The objectives of the CVCA's WBRMS include:

1. Protecting life and minimizing property damage from natural hazards, including drought, flooding and erosion.
2. Managing the watershed for the benefit of communities, economies and the ecosystems.
3. Protecting drinking water sources for the health of inhabitants using this water source while indirectly protecting the immediate environment.
4. Providing opportunities for the public to recreate on CVCA property and/or use the experience for outdoor educational purposes.
5. Protecting CVCA properties to help maintain and enhance the quality of the watershed.
6. Managing the CVCA's landholdings in a natural state with minimal changes to the landscape.

CVCA Watershed Programs and Services

The CVCA's Inventory of Programs and Services developed in accordance with recent legislative and regulation changes is the foundation for the objectives of the CVCA Watershed-Based Resource Management Strategy.

The CVCA provides a wide range of programs and services throughout the Crowe Valley watershed. These services include Water Management, Conservation Lands Management, Drinking Water Source Protection, Water Monitoring, Planning & Regulations

Water Management

Flood forecasting and warning

The CVCA collects and maintains data from water level, rainfall, and streamflow gauges as well as snow course data. This information in conjunction with forecasted weather results in a system to issue warnings for flooding and maintaining communications throughout all stages of a set of circumstances leading up to, during and after a flood event. The CVCA will provide this information to the public, municipalities and local emergency response services.

Water control infrastructure

The CVCA owns seven (7) structures in the watershed of various sizes and capacities. In addition, the CVCA manages and/or operates (6) Ministry of Natural Resources dams. There are also 2 hydro facilities located in the watershed. The operation of these structures includes the removal or placement of stoplogs to primarily control water levels throughout the year. These operational tasks are vital especially at key times such as flooding events. Once a flooding event has abated, the objective is to have sufficient water in the tributaries for the management of the water levels and flows for the competing interests in the watershed.

The CVCA generates revenue from the Marmora hydro facility through a lease agreement.

Low water response

The CVCA coordinates and provides the necessary data for the Ontario Low Water Response Program.

Flood hazard mapping

Within the resource capabilities of the CVCA, the Authority has engaged in the development of floodplain mapping and establishing mapping of regulated hazards (steep slopes) in the watershed. In addition, regulated mapping includes wetlands.

Planning and regulations

Section 28 of the Conservation Authorities Act requires a permit to be issued for development that would be allowed in hazard areas and/ or wetland setbacks. Since the CVCA watershed is primarily a natural watershed with limited development, there is a high percentage of wetlands still located in the watershed. As well, the watershed's numerous lakes and rivers have created a "cottage country" oasis with kilometers of natural shorelines and the associated flood plains.

By regulating development so that the risk to people and property in the watershed posed by natural hazards is mitigated the CVCA helps protect residents and their property throughout the Crowe Valley

watershed. By doing so, the overall health of the Crowe Valley watershed is maintained, which also contributes to the wellbeing and safety of the communities throughout the watershed. Watersheds that include environmentally healthy wetlands functioning without any interference are nature's flood attenuation tools. Simply compare an urban vs. rural watershed under the same conditions in a storm event will show the true value of wetlands when it comes to absorbing the effects of a flood scenario.

The CVCA also reviews municipal planning documents and development applications under the Planning Act to manage natural hazards.

Conservation Lands Management

The CVCA owns approximately 1,700 acres of property, which unfortunately is a small percentage of the watershed. However, the properties are varied and offer different natural experiences at each of the conservation areas. All of the properties except for the Crowe Bridge Conservation Area are maintained and operated by the CVCA. An agreement has been signed between the CVCA and the Municipality of Trent Hills for its operation, which also includes an entrance fee to the natural swimming area on the Crowe River. The remaining properties are free to use except for the cottage rental.

The CVCA's properties do contribute to the environmental health of the watershed by limiting development on the landholdings. There are trails on three of the properties which allows public access and enjoyment of everything they have to offer in terms of flora and fauna.

Drinking Water Source Protection

Under the *Clean Water Act 2006*, Source Protection Areas were established based on the watershed boundaries of Ontario's 36 Conservation Authorities. The Crowe Valley Conservation Authority, along with Ganaraska, Kawartha, Lower Trent and Otonabee Conservation Authorities have entered into a partnership creating the Trent Conservation Coalition Source (TCC) Protection Region. This region encompasses a 14,500 square kilometre area stretching from Algonquin Park to Lake Ontario and the Bay of Quinte.

As a partner, the CVCA Source Protection Authority supports municipalities and ensures source protection policies are implemented, updated and submits reports annually to the TCC Source Protection Committee.

In addition to the above, the CVCA provides Risk Management Official support through an agreement with one of its municipalities. This offer of support has also been extended to two other municipalities in the watershed.

Water Quality Monitoring

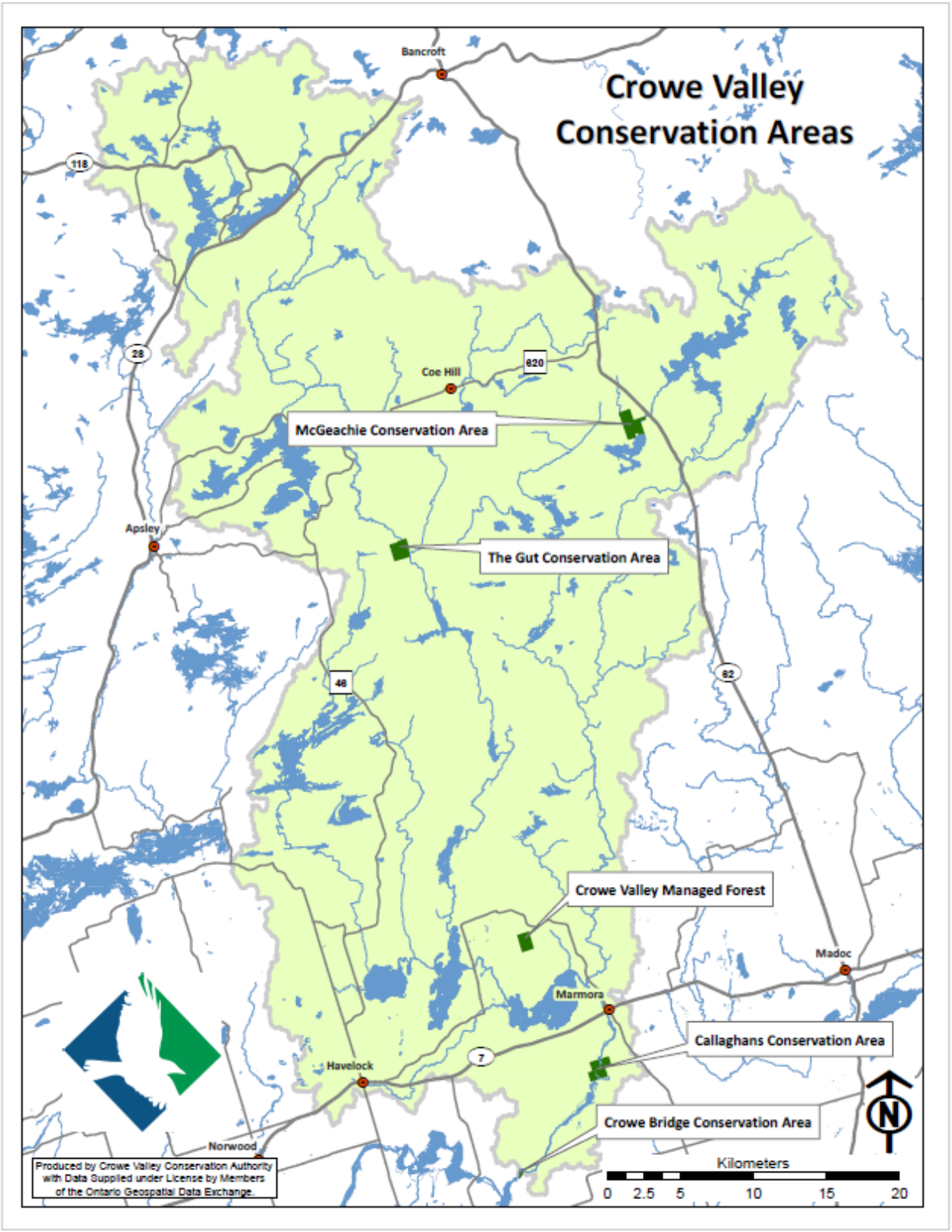
Beyond any doubt, water quality is critical to the health of the watershed's ecosystem which then has an immediate impact on the health and well-being of residents and visitors to the area. All of the watershed's inhabitants rely on either ground water or surface water which influences their lives and how they recreate in the watershed.

The CVCA participates in two water monitoring programs by partnering with the Ministry of the Environment, Conservation and Parks (MECP) to participate in the Provincial Water Quality Monitoring Network (PWQMN) and Provincial Ground Water Monitoring Network (PGMN). The PWQMN involves taking monthly surface water samples from April to November for chemical analysis.
The CVCA monitors groundwater through the Provincial Groundwater Monitoring Network at 6 wells throughout the watershed and is also a joint venture with MECP. The wells are sampled annually in the fall of each year and the samples are sent to the MECP labs where they are used to determine a number of water quality parameters. This monitoring helps to assess the overall health of the Crowe Valley watershed.
As well, the CVCA through the support of its member municipalities collects benthic invertebrates for the Benthic Monitoring Program. Benthic macroinvertebrates are animals without backbones that can be seen with the naked eye that live on, in, or near the bottom of water bodies. These organisms are often used to monitor water quality in river, creeks and steams as they are good health indicators of aquatic ecosystems. Sites throughout the watershed are assessed based on basic water chemistry and benthic macroinvertebrate community composition. This is achieved through the use of the Ontario Stream Assessment Protocol (OSAP) and Ontario Benthos Biomonitoring Network (OBBN).

Should the above noted data indicate water quality is deteriorating, this would allow all stakeholders (the CVCA, municipalities, the Province and other agencies) to take action to improve water conditions.

Through the CVCA preserving and providing access to our pristine Conservation Areas, the public is able to appreciate and learn from the natural environment that provides us all with so many vital ecosystem services. There have been numerous studies demonstrating the vast benefits of spending time in nature and the CVCA provides this opportunity to visitors and members of the communities it serves. Not only does protecting these natural areas help to prevent the degradation of the natural ecosystems in the watershed, the benefits of which are described above, but it also provides the invaluable service to the community of access to nature.

Map 3: CVCA Conservation Areas



Into the Future

The Crowe Valley Conservation Authority has been given the legislative responsibility to 1) protect people and property from natural hazards, 2) monitor the health of the watershed and 3) give the public an opportunity to enjoy the environment through experiences on property owned by the CVCA.

This guiding legislative framework is supported by the services and programs offered by the CVCA within the financial support from our member municipalities and various other revenue streams. Future budgets will be key to deal with ongoing pressures and support of all stakeholders will ensure the CVCA is ready to engage issues and concerns affecting the primary components and responsibilities of the watershed as detailed in this strategy. As a result, the CVCA firmly believes this organization is compliant, yet also positioned to be quick to change its programs as necessary if the stresses on the watershed demand an alteration to the current direction outlined in this WBRMS or should opportunities for growth prevail benefitting Municipal partners and watershed residents.

All of the watershed services and programs the CVCA implements are the platform for the guiding principles of the Authority. The services and programs work in tandem to preserve the health of the watershed and help to protect the people and property that make up the communities throughout the Crowe Valley watershed. It is a symbiotic relationship that must be strengthened to maintain a robust and thriving environmental, economic and socially viable Crowe Valley watershed for human activities and the natural flora and fauna dependent on our management of the crucial resources bestowed upon the CVCA.

The services and programs will be reviewed at regular intervals, with the first review to be conducted five years from the adoption of this strategy or if necessary, at an earlier date requested by the CVCA Board of Directors.

Conclusion

Watershed-based resource management will play a major role in the future of Ontario and the Crowe Valley watershed is a key cog in the provincial landscape. The impacts of climate change are already causing significant harm and damages due to increases in extreme weather events. The CVCA must remain vigilant in delivering the vital services described in this report as efficiently and effectively as possible. The CVCA has a responsibility to the communities it serves to protect people and property from natural hazards posing a threat to community members in the Crowe Valley watershed such as flooding and erosion.

The continuation of funding that covers the costs incurred by the CVCA is vital to the CVCA's ability to provide the services listed in this report. Ensuring funding commitments will allow the CVCA to continue to deliver these services and if funding were to be increased beyond the base level, it could allow the CVCA to improve and expand on these services, providing invaluable benefits to the communities in the Crowe Valley watershed and ultimately have an impact on the province.

The CVCA takes pride in delivering a vital watershed-based resource management approach for communities and all stakeholders in the Crowe Valley watershed. Through the strategy outlined in the report, the CVCA will continue to provide these services to the best of its ability in order to protect people, property, and natural ecosystems.

Appendix A: Programs & Services, Technical Studies & Cost Estimates

Category 1: Mandatory		
Programs & Services	**Description**	**Program Guidance**
Watershed Management • Flood Forecast & Warning • Water Control Structures	• Operate remote water level stations • Drought Response Program • Maintain seasonal water levels & flows • Remove & replace stoplog operations as required • Maintain computerized flood forecast & warning system • Operate a duty forecast system to monitor daily water levels 365 days/yr • Maintain flood warning communication system • Collect & maintain data (water level & flow, snow, precipitation) • Issue public safety notifications (flood warnings) • Update & maintain floodplain mapping • Develop natural hazards mapping • Generate hydro revenue	• Crowe River Water Management Study Flood Forecast Manual • Crowe River Flood Forecasting & Information System • Crowe River Management Study Dam Operations Manual • Dam Safety Assessments • CVCA FHIMP Modeling and Mapping – Crowe River Catchment • CVCA FHIMP Modeling and Mapping – Chandos Lake Catchment • Chandos FHIMP Modeling and Mapping • Crowe River FHIMP Modeling and Mapping • Historical water level and flow data • Data collected for precipitation & from snow courses • Crowe Valley Conservation Report • Operating agreement with current hydro facility owner
Conservation Lands Management	• Maintain passive Conservation Areas • Maintain trail networks • Maintain & administer seasonal cottage rentals • Administer leased Conservation Area • Maintain the Managed Forest Tax Incentive Program (MFTIP) • Monitor & maintain forest management plans (tree planting, harvesting) • Hazard tree management	• MFTIP • Land Inventory

	• Offer hunting on designated CVCA properties	
Drinking Water Source Protection	• Deliver the provincial source protection planning program under the *Clean Water Act 2006,* for the Crowe Valley Source Protection Area	• *Clean Water Act 2006* • Trent Source Protection Plan • CVCA Watershed Characterization Report
Water Quality	• Surface water quality monitoring and ground water quality monitoring	• Data collected under PWQMN & PGMN

Category 2: Non-Mandatory Municipal Partnership Agreements		
Programs & Services	**Description**	**Program Guidance**
Risk Management Official	• Deliver Services for Municipality to ensure compliance with *The Clean Water Act*	• Trent Source Protection Plan • *The Clean Water Act 2006* • Municipal MOU

Category 3: Other		
Programs & Services	**Description**	**Program Guidance**
Ontario Benthic Biomonitoring Network	• Collecting & Analyzing Invertebrate sampled throughout CVCA watershed	• OBBN Manual

Cost Estimates		
Category	**Operational Costs**	**Capital**
1	• 2024 Budget • 2025-2029 yearly rate of inflation increases plus operational pressures	• TBD based on Asset Management Plan
2	• 2024 Budget • 2025-2029 yearly rate of inflation	• N/A
3	• 2024 Budget • 2025-2029 yearly rate of inflation increases	• N/A