08-24-BOD Agenda (November)
Nottawasaga Valley Conservation Authority
Friday, November 22, 2024 at 9:00 AM EST to Friday, November 22, 2024 at 12:00 PM EST

Agenda

1. Events

Tiffin Nature School
At Tiffin Nature School, children aged 2.5 to 10 are invited to explore and connect with the natural world. We nurture their innate curiosity, offering immersive outdoor experiences that inspire discovery and growth.
Dates: Tuesdays & Thursdays until May 29, 2025
Location: Tiffin Centre for Conservation

2. Call to Order

3. Land Acknowledgement

Nottawasaga Valley Conservation Authority Board acknowledges that we are situated on the traditional land of the Anishnaabeg people. The Anishnaabeg include the Ojibwe, Odawa, and Pottawatomi nations, collectively known as the Three Fires Confederacy. We are dedicated to honouring Indigenous history and culture and committed to moving forward in the spirit of reconciliation and respect with all First Nation, Métis and Inuit people.

4. Declaration of Pecuniary and Conflict of Interest

5. Motion to Adopt the Agenda

Recommendation:
RESOLVED THAT: the agenda for the Board of Directors meeting #08-24-BOD dated on November 22, 2024 be approved.

6. Announcements

There are no announcements at this time.

7. Deputations

There are no deputations at this time.

8. Hearings

There are no hearings at this time.

9. Determination of Items Requiring Separate Discussion

Board members are requested to identify items from the Consent List that they wish to have considered for separate discussion.

10. Adoption of Consent List and Identification of Items Requiring Separate Discussion

Recommendation:
RESOLVED THAT: agenda item number(s), 11.2.2 was identified as requiring separate discussion, be referred for discussion under Agenda Item #11; and
FURTHER THAT: all Consent List Agenda Items not referred for separate discussion be adopted as submitted to the board and staff be authorized to take all necessary action required to give effect to same; and
FURTHER THAT: any items in the Consent List not referred for separate discussion, and for which conflict has been declared, are deemed not to have been voted on or discussed by the individual making the declaration.

11. Consent List

11.1. Adoption of Minutes

Recommendation:
RESOLVED THAT: the minutes of the Board of Directors meeting 07-24-BOD dated on October 25, 2024 be approved.

11.2. Staff Reports

11.2.1. Staff Report No. 36-08-24-BOD from Hendrik Amo, Manager, Information Services and Technology regarding Watershed-Based Resource Management Strategy

Recommendation:
RESOLVED THAT: the Board of Directors approve Staff Report No. 36-08-24-BOD regarding NVCA's submission of the Watershed-Based Resource Management Strategy.

11.2.2. Staff Report No. 37-08-24-BOD from Kyra Howes, Director, Conservation Services regarding Updated 2025 Conservation Services Fees

Recommendation:
RESOLVED THAT: The Board of Directors receive Staff Report No. 37-08-24-BOD regarding proposed 2025 and select 2026 changes to Conservation Services fees, and;
FURTHER THAT: the Fee Schedule, which includes Appendices A to C be approved as attached.

11.2.3. Staff Report No. 38-08-24-BOD from Dalia Al-Ali, Manager, Engineering Services regarding Award of Contract for Request for Proposal (RFP) #01/2024

Recommendation:
RESOLVED THAT: the Board of Directors receive Staff Report No. 38-08-24-BOD regarding the award of a contract for the completion of the scope of work presented in Request for Proposal (RFP) #01/2024.

11.2.4. Staff Report No. 39-08-24-BOD from Dalia Al-Ali, Manager, Engineering Services regarding Review and Approval of Natural Hazard Infrastructure & Ice Management Plans

Recommendation:
RESOLVED THAT: the Board of Directors receive Staff Report No. 39-08-24-BOD regarding the mandated Natural Hazard Infrastructure Operational Plan and Ice Management Plan, and;
FURTHER THAT: the Board of Directors approve both plans as presented.

11.2.5. Staff Report No. 40-08-24-BOD from Sheryl Flannagan, Director, Corporate Services regarding 2024 Year End Surplus/Deficit Allocation

Recommendation:
RESOLVED THAT: the Staff Report No. 40-08-24-BOD regarding surplus/deficit allocations be approved; and
FURTHER THAT: The NVCA Auditor be directed to place any 2024 surplus/ deficit funds in/out of the following reserves as specified in the report.

11.2.6. Staff Report No. 41-08-24-BOD from Maria Leung, Senior Communications Specialist regarding Communications Report

Recommendation:
RESOLVED THAT: Staff Report No. 41-08-24-BOD regarding NVCA Communications – *October 11, 2024 – November 8, 2024,* be received.

12. Other Business

13. Adjourn

Recommendation:
RESOLVED THAT: this meeting adjourn at _____ to meet again on December 13, 2024 or at the call of the Chair.

Staff Report: 36-08-24-BOD

Date: 22/11/2024

To: Chair and Members of the Board of Directors

From: Hendrik Amo
Manager, Information Services and Technology

SUBJECT: Watershed-Based Resource Management Strategy

Recommendation

RESOLVED THAT: the Board of Directors approve Staff Report No. 36-08-24-BOD regarding NVCA's submission of the Watershed-Based Resource Management Strategy.

Purpose of the Staff Report

The purpose of this Staff Report is to advise the Board of the document and receive approval for submission.

Background

Section 21.1 of the CA Act sets out the *Mandatory Programs and Services* which must be delivered by all conservation authorities; these are described in more detail under *Ontario Regulation 686/21. Section 21.1.1 of the Conservation Authorities Act (CA Act)* refers to the *Mandatory Programs and Services* that conservation authorities are permitted to provide under agreement with its member municipalities. Section 21.1.2 sets out the *Other Programs and Services* that conservation authorities are permitted to deliver.

Subsection 12(1) paragraph 3 of the Regulation requires all conservation authorities to prepare a watershed-based resource management strategy in

accordance with subsections 12(4) through (9). To be completed by the end of 2024.

Issues/Analysis

A committee was formed comprising of management staff,

Kyra Howes, Director, Conservation Services
Hendrik Amo, Manager, Information Services and Technology
Mike Bacon, Manager, Lands and Operations
Maria Leung, Senior Communications Specialist

Current board-approved documents were referenced in the development of the Watershed-Based Resource Management Strategy (WBRMS)

i) NVCA Strategic Plan 2020-2025
ii) NVCA Business Plan 2021-2025
iii) Integrated Watershed Management Plan (approved June 2019)
iv) NVCA's Inventory of Program and Services (approved April 2024)
v) Climate Change Action Plan 2022-2025

By referencing the above listed documents, the WBRMS maintains consistent messaging regarding NVCA's goals, objectives, and guiding principles. The WBRMS illustrates core programs NVCA delivers, ensuring the "Mandatory Services and Programs" outlined in Section 21.1 of the CA Act are met.

The WBRMS was vetted through all Senior Management and Management staff and went through a 30-day public consultation process where opportunity for comment was provided. Feedback was sought on the stressors and challenges associated with NVCA's Programs and Services, as well as mitigation strategies to address them.

Relevance to Authority Policy/Mandate

The actions noted in this report are intended to be consistent within the noted legislation of *Ontario Regulation 686/21* and the *CA Act*.

Impact on Authority Finances

This project was carried out and implemented through the approved budget.

Climate Change Implications

This report has no climate change implications.

Reviewed by:
Original Signed by
Hendrik Amo
Manager, Information Services
and Technology

Approved for submission by:
Original Signed by
Doug Hevenor

Chief Administrative Officer

Attachment:

NVCA Watershed Based Resource Management Strategy.pdf

2024 DRAFT Watershed-based Resource Management Strategy

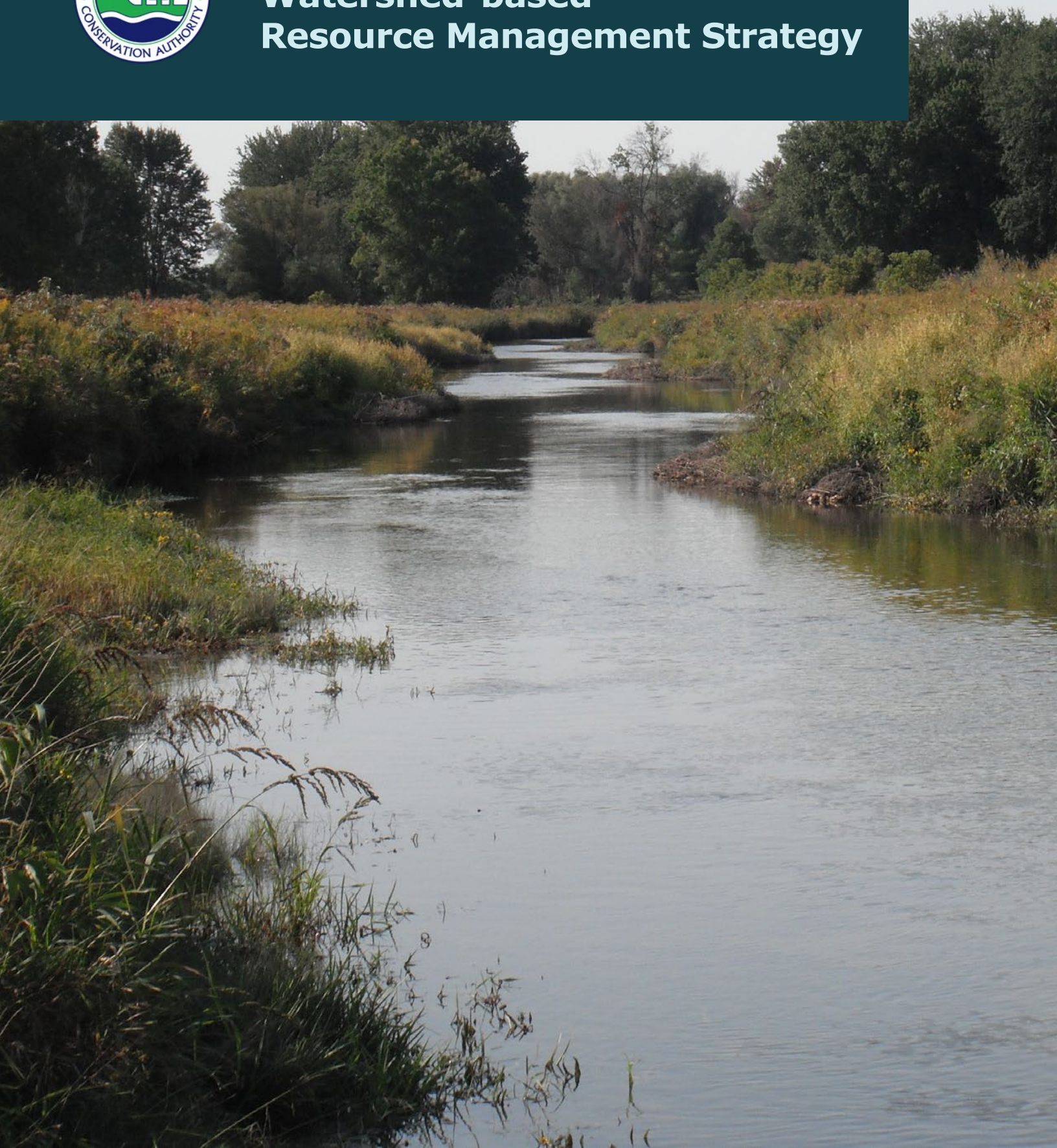


Table of Contents

NVCA's Vision

A sustainable watershed that is resilient to the effects of climate change, urban growth and other stressors and provides for safe, healthy and prosperous people and communities.

NVCA's Mission

Working together to deliver innovative, integrated watershed management that is responsive to the environmental, economic and social sustainability of the Nottawasaga Watershed.

What We Value

An abundance of clean water, clean air and fertile soils that provide for healthy people and ecosystems.

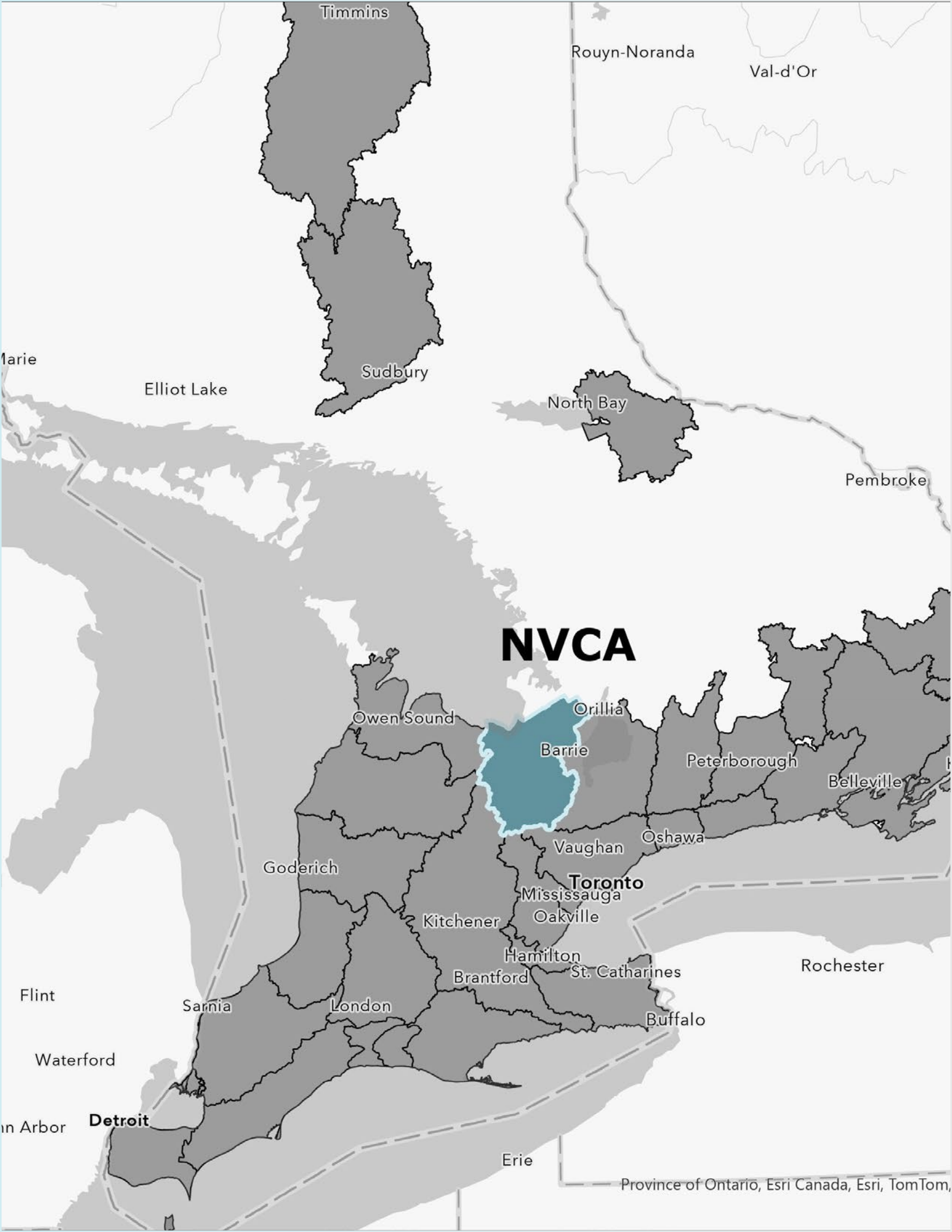
Natural heritage systems and the ecosystem services they provide, particularly as they support resilience to the effects of a changing climate.

Distinctive landforms and waterways including the Georgian Bay coastline, Niagara Escarpment, Minesing Wetlands and others that give our watershed a unique sense of place.

Quality recreational opportunities that our hills, forests, meadows, wetlands, waterways and coastline provide for residents and tourists alike.

A wealth of resources within the capacity of our watershed to provide for thriving communities, successful economies and sustainable agriculture, now and in the future.

To learn more about the benefits of having a healthy watershed, visit NVCA's website.


NVCA
Timmins
Rouyn-Noranda
Val-d'Or
Sudbury
Elliot Lake
North Bay
Pembroke
Owen Sound
Orillia
Barrie
Peterborough
Belleville
Oshawa
Vaughan
Goderich
Toronto
Mississauga
Oakville
Kitchener
Hamilton
Brantford
St. Catharines
Rochester
Flint
Sarnia
London
Buffalo
Waterford
Detroit
Erie
Province of Ontario, Esri Canada, Esri, TomTom,

About the Nottawasaga Watershed

The Nottawasaga Watershed is a large geographic area, approximately 3,700 km2, with jurisdiction in 18 municipalities in the counties of Simcoe, Dufferin and Grey. It consists of a diverse mix of growing cities, small towns, rural communities and productive agricultural land. It is also home to a variety of natural landscapes, abundant recreational trails and other amazing natural features like the internationally significant Minesing Wetlands and the Niagara Escarpment.

Natural resources such as wetlands, rivers, streams, forests and groundwater are critical to our society, economy and environment. Not only do these natural resources sustain our lives and benefit our health and wellbeing, they help to clean our air, control flooding, protect us from summer heat, help improve our mental and physical health and much more. A healthy watershed is also resilient to climate change and urban growth.

NVCA works with member municipalities, as well as many funders, partners, volunteers, landowners and residents to sustainably manage this watershed by balancing social, economic and environmental interests through an integrated watershed management approach.

NVCA developed a characterization report of the Nottawasaga Watershed in 2018. Please contact NVCA to access the report.

Purpose of the Watershed Based Resource Management Strategy

Under recent changes to the *Conservation Authorities Act* (*CA Act*) and Ontario Regulation 686/21, conservation authorities (CAs) in Ontario are required to complete a Watershed-Based Resource Management Strategy (WBRMS) on or before December 31, 2024.

NVCA's WBRMS identifies the risks, issues and challenges in the Nottawasaga Watershed along with mitigation strategies to address these concerns through an integrated watershed management approach.

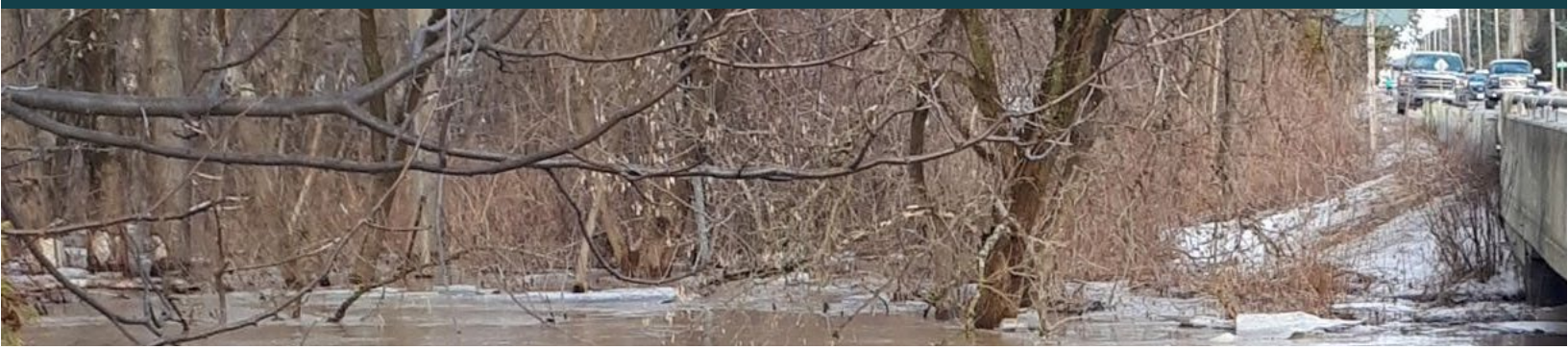
In developing the WBRMS, watershed health and trends, program effectiveness and other guidance documents were considered.

These guidance documents include:

- Integrated Watershed Management Plan
- Strategic Plan
- Business Plan
- Climate Change and Action Plan
- Watershed Health Checks
- Asset Management Plan
- Conservation Areas Strategy
- Fisheries Habitat Management Plan

The guidance documents listed above are used to guide program delivery. The WBRMS refers to these guidance documents to ensure objectives and goals are aligned.

Guiding Principles & Objectives



The development of NVCA's WBRMS is guided by the following principles:

- The Nottawasaga Watershed connects all 18 municipalities though natural resources such as rivers, streams, wetlands, forests and groundwater.
- A well-managed watershed is crucial for sustaining prosperity, growth, well-being and climate change resiliency.
- When developing programs and making decisions, an integrated watershed management approach is a priority as it encompasses human, economic and environmental needs.
- NVCA's programs adapt and respond to changing conditions, priorities, vulnerabilities and pressures.
- Collaboration and partnerships are essential in addressing complex and interrelated issues within the natural, economic and social environments.

The objectives of NVCA's WBRMS are to:

1. Protect life and property from natural hazards such as flooding and erosion.
2. Evaluate the status and trends of watershed health and share information with NVCA staff, municipalities, partners and other organizations who have a role in managing the Nottawasaga Watershed.
3. Ensure that the ecological integrity, climate change resiliency and biological diversity of natural heritage systems is maintained on conservation lands.
4. Foster awareness and appreciation of the watershed's natural features through outdoor experiences, opportunities and education.
5. Mitigate potential risks to drinking water sources and ensure a sustainable and clean water supply for the watershed.
6. Conserve, enhance and restore natural areas to improve ecosystem health and resilience.

Public Consultation

NVCA staff conducted public consultation through an online survey to seek feedback on the risks, issues, challenges and mitigation strategies identified in the WBRMS.

The public consultation was shared with NVCA's municipal partners, community groups, the development community, Indigenous groups, the general public and other interest holders.

In total, NVCA received 45 comments submitted through the online survey, and one comment was submitted through email. Over 90% of the respondents strongly agreed or agreed with the risks, issues and challenges identified in the WBRMS. When asked if there were additional measures NVCA could take to mitigate the issues, challenges and risks, NVCA received between 10-15 responses for each category.

Approximately 40% of the respondents were members of non-governmental organizations, 25% were members of the general public, and 12% were representatives or staff of government agencies.

While some comments received were not applicable to NVCA's mandate or the scope of the WBRMS, other comments may be taken into consideration on future strategic planning.

Programs and Services Assessment

Maintaining and enhancing natural resources is critical in ensuring the Nottawasaga Watershed is resilient to climate change and human use. This requires an integrated approach that brings stakeholders and interest groups together from across the watershed to develop and implement strategies that achieve a sustainable and resilient system.

The next section of the strategy outlines the challenges, stressors and issues that the Nottawasaga Watershed faces, as well as the strategies to mitigate them.

Development Pressure and Urban Growth

Population growth, and the resulting urbanization, presents a challenge for the protection and enhancement of the watershed's natural resources. A healthy watershed helps protect and enhance lives in many different ways.

Development in a watershed sustainably requires a well thought out plan, and maintaining natural resources must be balanced with development pressures.

Mitigation Strategies

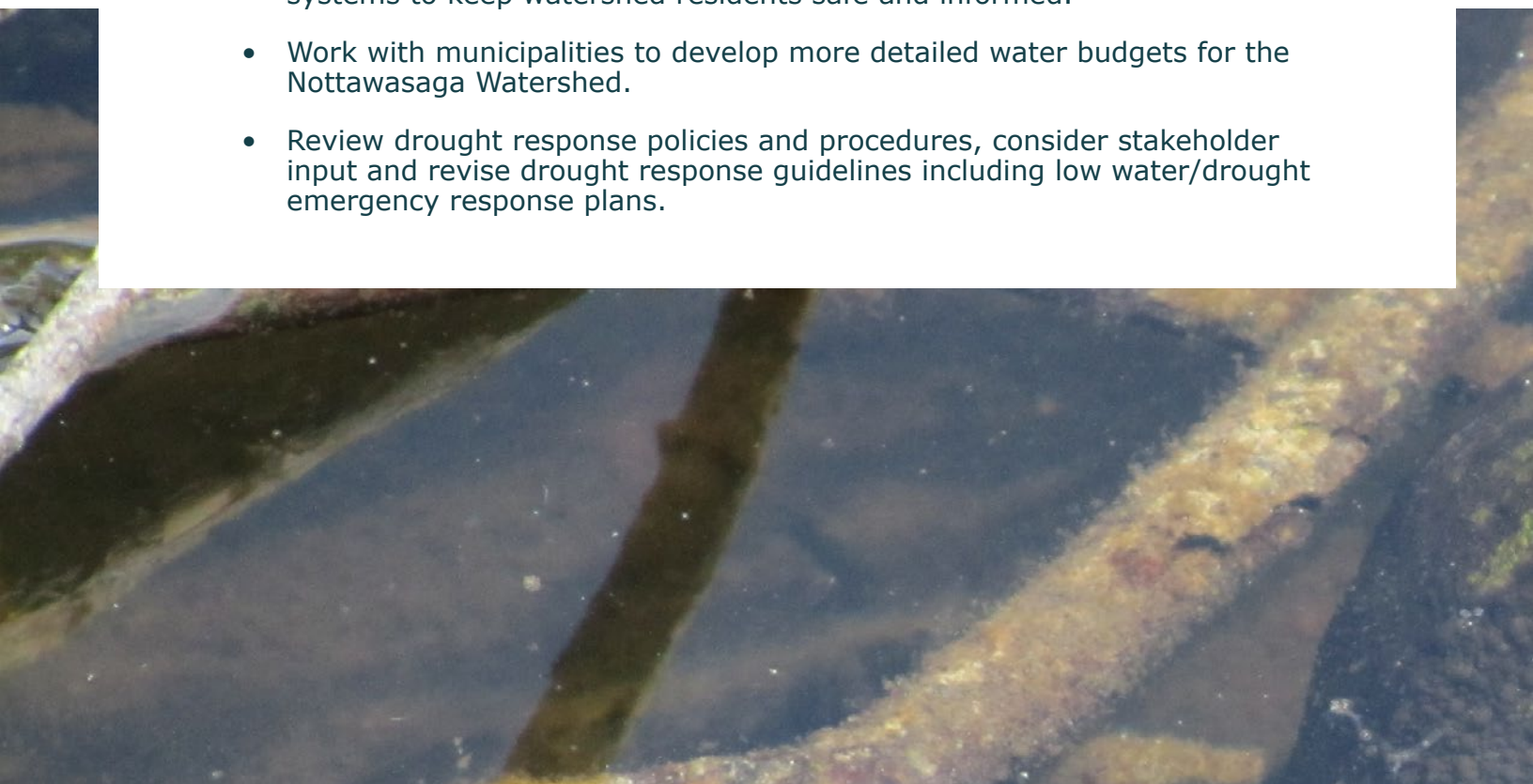
- Prioritize development of subwatershed studies and plans to balance development pressures and the enhancement and protection of natural resources.
- Encourage a collaborative approach to protect and enhance water resources through managing drinking water, sewage and stormwater on a watershed scale.
- Ensure new infrastructure projects protect human health, safety and the natural environment.
- Ensure stormwater management plans consider cumulative impacts of development on a watershed scale.
- Encourage the incorporation of green infrastructure in stormwater management plans to minimize erosion and changes in water balance.
- Ensure development is generally directed outside of regulated areas where lives and properties can be impacted by flooding, erosion or other natural hazards.

Climate Change

The Nottawasaga Watershed is already experiencing the effects of climate change, including more frequent and intense weather events that lead to flooding, drought, habitat change and biodiversity loss. These events have resulted in property destruction and significant financial implications. Climate change will continue to have social, economic and ecological impacts in the Nottawasaga Watershed.

Mitigation Strategies

- Encourage local municipalities to include and implement climate change policies in their official plans.
- Assess land use development applications using a climate change lens and develop criteria to determine if proposed developments incorporate appropriate climate action principles.
- Develop new hydraulic and hydrologic models and mapping that consider future climate projections, impacts of human use and areas in the Nottawasaga Watershed that are vulnerable to natural hazards.
- Collaborate with other conservation authorities, municipalities and the Province of Ontario to ensure development guidelines incorporate future climate projections to help enhance climate change resiliency.
- Adapt conservation area programs, services and asset management plans to address changing climate conditions.
- Provide landowners, property managers and other professionals with knowledge and resources to help them make informed decisions that contribute to building climate change resilient and environmentally sustainable communities.
- Enhance flood forecasting and real-time flood monitoring and warning systems to keep watershed residents safe and informed.
- Work with municipalities to develop more detailed water budgets for the Nottawasaga Watershed.
- Review drought response policies and procedures, consider stakeholder input and revise drought response guidelines including low water/drought emergency response plans.



Biodiversity and Habitat Loss: Wetlands, Forest and Shoreline Vegetation

The loss of forest cover, shoreline vegetation and wetlands is resulting in habitat loss and decline in biodiversity. Invasive species disturb wetlands and terrestrial ecosystems, causing tree mortality across the watershed. Human activity continues to encroach on natural environments, decreasing species diversity through habitat loss.

Mitigation Strategies

- Promote reforestation and naturalization to improve soil and water conservation, store carbon, moderate local climate, provide shade to regulate temperature extremes, increase wildlife habitat and improve capacity to adapt to climate change.
- Manage, sustain and restore natural features, such as wetlands and forests, to increase resiliency to the effects of climate change.
- Increase protected areas through land acquisition and securement.
- Encourage municipalities to review minimum planting requirements to ensure recommended species lists include plants that are expected to adapt to future climates.
- Maintain the health of local watercourses by ensuring proposed developments have adequate erosion and sediment controls as well as associated contingency plans.
- Develop conservation area management plans that prioritize the identification of significant ecological features and areas that should be preserved from development.

Agricultural Lands

Agriculture covers a substantial percentage of the land base in the Nottawasaga Watershed. While many farmers have implemented best management practices to minimize soil and nutrient loss, there are still farms that may benefit from practices such as planting vegetated buffers, installing fencing along watercourses, conservation tillage and improving manure storage and handling.

Mitigation Strategies

- Continue to collaborate with agricultural communities through the Stewardship Services and Environmental Restoration Program.
- Maintaining natural riverine flow and buffers through agricultural lands.
- Encourage the adoption of Agricultural Best Management Practices and Environmental Farm Plans.

Aging Infrastructure

NVCA is responsible for coordinating the inspection, maintenance and repair of six flood management structures, which include dams and an ice management structure. NVCA also owns and operates infrastructure related to conservation authority administration and recreation on conservation lands. Aging infrastructure is becoming more costly to repair and replace, and may increase the potential risks to public safety, properties and liabilities.

Mitigation Strategies

- Develop management plans, master plans and/or infrastructure plans as appropriate to guide the long-term operation and maintenance of properties and associated infrastructure.
- Demonstrate leadership by incorporating green infrastructure and sustainable technologies in conservation area and infrastructure planning.
- Strike a balance between user-fees, externally generated revenues (i.e. grants, sponsorship, donations) and levy.
- Update NVCA's Capital Asset Management Plan to anticipate and cover capital costs associated with infrastructure repair and renewal.
- Implement regular maintenance standards on NVCA infrastructure.
- Investigate the incorporation of climate change scenarios into Dam Breach Models to ensure major infrastructure is able to handle more intense and frequent storms and rain events.

Water Resources

The Nottawasaga Watershed is made up of groundwater and surface water features and the Nottawasaga River forms the backbone of the system within the watershed.

In some areas, aquifers are vulnerable to land-based activities, including urban development, agriculture, and management practices such as the application of road salt, manure or fertilizer. Elevated levels of nitrates, chlorides, sodium and industrial contaminants in groundwater may become a concern in some parts of the watershed.

As the Nottawasaga Watershed continues to develop, continued efforts will be required to ensure non-point sources of phosphorus and other nutrients are not impacting surface and groundwater.

Mitigation Strategies

- Promote innovative erosion control and stormwater management practices, such as low impact development.
- Continued support for the Provincial Water Quality Monitoring Network (PWQMN) and Provincial Groundwater Quality Monitoring Network (PGMN).
- Complete a comprehensive study to identify erosion, transport and sedimentation processes and define priority management actions.
- Continue to provide grants and technical advice through the Healthy Waters Program to the agricultural community to implement agricultural best management practices.

Flood and Erosion

Protecting people and property from flooding is a shared responsibility between municipalities, conservation authorities and the Ministry of Natural Resources (MNR).

MNR and NVCA are primarily responsible for operating a flood forecasting and warning system. Through the planning and regulatory approvals outlined in the *CA Act*, NVCA ensures development is directed outside of floodplains and other natural hazard areas to avoid the loss of life and damage to property due to flooding.

Climate change is predicted to bring more frequent and intense storms which will result in increased fluctuations in water levels in the Nottawasaga Watershed. These storms are expected to further increase erosion hazards in the watershed.

Urban development increases stormwater runoff, exposing creeks and rivers to more frequent erosive forces. Removal of riparian vegetation weakens channel banks, causes bank instability and increases erosion hazard.

Mitigation Strategies

- Protect natural heritage features that provide water quantity control in flood prone areas.
- Update floodplain mapping to better understand flood risk and further identify flood prone areas.
- Complete erosion hazard assessments in areas of concern to improve erosion hazard mapping accuracy.
- Adopt advanced flood monitoring and warning systems to increase accuracy and timeliness of flood messaging and warning.
- Identify opportunities to optimize the natural form and function of watercourses to mitigate erosion risk.

Description of Programs and Services

NVCA delivers programs and services to address the issues, risks and challenges through three organizational program and service areas – Watershed Management Services, Conservation Services and Corporate Services, which are listed in further detail below.

A list of NVCA's programs and services was developed in 2022 as part of the Inventory of Programs and Services that conservation authorities were required to complete under Ontario Regulation 686/21. A modified inventory can be viewed in Appendix A.

Watershed Management

Watershed Management Services works with municipal partners, the Province of Ontario and the public to protect lives and properties from natural hazards, while also safe-guarding drinking water and monitoring the health of the Nottawasaga Watershed. Key program areas consist of Natural Hazard Management and Watershed Science.

Natural Hazard Management

The goal of the Natural Hazard Management Program is to protect lives and property from flooding, erosion and other natural hazards.

NVCA takes a proactive approach to flood management by directing development outside of floodplains, managing and maintaining a network of rain and flow gauges, identifying natural hazards and maintaining extensive floodplain mapping across the watershed.

Staff in the Natural Hazard Management Program review permit and development applications and comments on municipal plans and natural hazard policies. They also operate a flood forecasting and warning system, maintain flood and erosion control infrastructure, develop technical studies to ensure that the latest available science/technology is informing decisions relating to natural hazards and their management, provide ice management services, and offer education and public awareness opportunities.

Planning and Regulation Services

NVCA is a regulatory body under the *CA Act* and a public body under the *Planning Act*. In addition, NVCA is also a commenting agency with delegated responsibilities from the MNR to avoid loss of life and damage to property from flooding, erosion and other natural hazards.

Under the *CA Act*, property owners looking to develop in areas with natural hazards associated with rivers, streams, wetlands and shorelines must apply for a permit from NVCA.

Staff in the Planning and Regulation Services Program work closely with municipal partners to ensure proper permits are in place prior to development. If a property is in an NVCA regulated area, property owners must obtain a permit from NVCA before municipalities can issue a building permit.

Early in the development planning process, NVCA's engineers, ecologists and groundwater specialists review the proposed development plan to identify potential risks that may be impacted by the proposed development. This information is communicated to developers and municipalities, and additional information may be requested. This may include environmental impact studies, natural hazard studies and stormwater management studies.

NVCA establishes annual partnership agreements with municipalities to identify key roles and services in the development plan review process. Examples include expertise in flooding, erosion, stormwater management, natural heritage and groundwater. The partnership agreements help ensure that development application reviews are coordinated and streamlined.

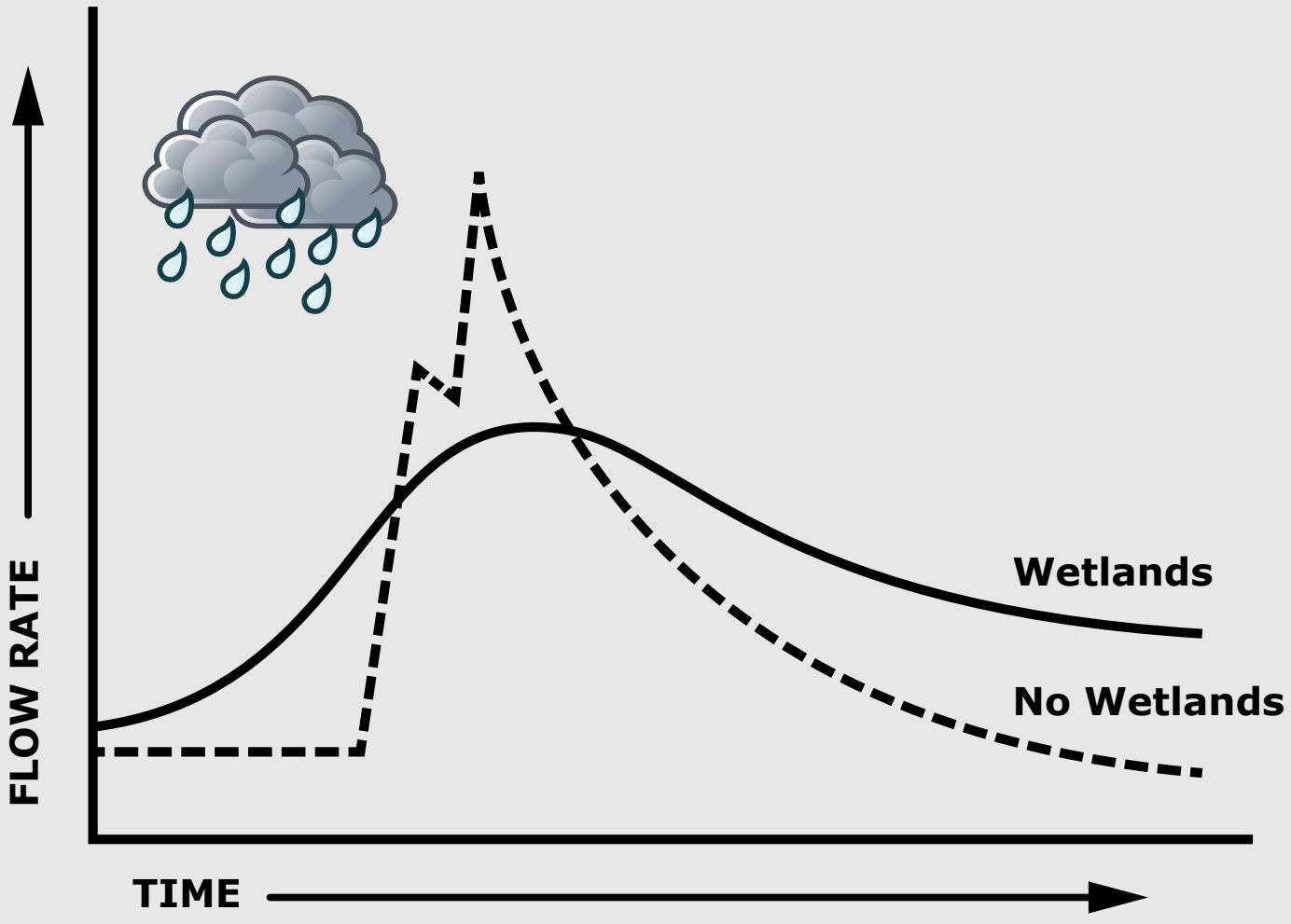
Flood Warning and Engineering Services

Staff in the Flood Warning and Engineering Services Program provide wide-ranging expertise in the hydrology and hydraulics of the watershed. Their knowledge and experience allow NVCA to deliver technical expertise related to the magnitude and severity of natural hazards such as flooding and erosion.

Engineering Services works closely with the Planning and Regulation Services Program to review technical studies to ensure development plans meet requirements under the *CA Act*.

In addition, the Flood Forecasting and Warning Program monitors watershed conditions and notifies local municipalities, agencies and the public of potential flood events and associated issues to allow time to prepare and respond.

To identify flood risk, this program collects and interprets information such as precipitation and watercourse flow data, weather forecasts, watershed conditions, snow surveys, frazil ice forecasts, wind direction, site conditions, watershed knowledge of susceptible areas for flooding and provincial flood forecasts. Access to these tools is increasingly critical in the face of climate change.



Padmavathi, P. & Kandru, Ammani & Mishra, Shakun & Vhanalakar, Sagar & Vhanalakar, Sharadrao & Srinu, Gatreddi. (2017). Wetlands of India: Biodiversity, Ecological Services and Strategies for Conservation.

NVCA's Engineering Services also operates and maintains flood management infrastructure which mitigate flood hazards and, in some cases, erosion hazards.

Low water contingency planning is the responsibility of local water users, municipalities, conservation authorities and the MNR.

NVCA collects information regarding low water conditions and presents the analysis to the Water Response Team, a committee made up of stakeholders and interest holders. NVCA's Low Water Contingency Plan provides a roadmap and response procedures if Level I, Level II or Level III low water conditions are declared with input from the Water Response Team.

NVCA's ice management activities involve seasonal monitoring of known ice jam locations within the watershed, and providing information and expertise to municipalities to mitigate or remove ice jams. Typically, the frequency of inspections is informed by data gathered through the Flood Forecasting and Warning Program, as well as institutional understanding of environmental conditions.

Watershed Science

The goal of the Watershed Science Program is to develop a better understanding of the watershed functions through monitoring and reporting. The program works to gain an understanding of the physical and ecological processes governing watershed functions, and how they respond to change.

This information is summarized through NVCA's Watershed Report Cards, which are an important tool for policy makers, municipalities and watershed residents as they highlight priority actions to protect, restore and enhance the watershed.

Surface Water and Groundwater Monitoring Services

NVCA has partnered with the Province to deliver the PWQMN and PGMN. Through these partnerships, the Watershed Science Program conducts stream water quality monitoring, as well as groundwater level and water quality monitoring across the watershed.

Stream quality data are used to prepare reports on watershed health, and are available to municipal partners for infrastructure development projects. In addition, NVCA uses the data to help identify priority sites for restoration projects.

Groundwater data are used to monitor low water conditions and groundwater quality of many of the local aquifers. NVCA also uses the data in the preparation of Watershed Health Checks.

The coverage of the PWQMN and PGMN in the Nottawasaga Watershed is limited, to that end the Watershed Science Program carries out additional surface and groundwater monitoring programs. The additional monitoring allows for a better understanding of the current condition and stresses on watershed health. These data are used to evaluate and report on existing conditions and trends within the watershed and help to establish targets for protection and rehabilitation services.

Source Water Protection

The Drinking Water Source Protection Program (DWSP) was established by the Province of Ontario. It uses a multi-barrier approach to ensure Ontarians have clean, safe and sustainable municipal drinking water sources. Legislations relevant to DWSP include the *Clean Water Act* and the *Safe Drinking Water Act*.

As part of the South Georgian Bay Lake Simcoe Source Protection Region, NVCA administers the Nottawasaga Valley Source Protection Authority (NVSPA). This includes overseeing the implementation of Source Protection Plans, developing assessment reports, identifying priority drinking water issues and other activities required by the *Clean Water Act* and its regulations.

Risk Management under the Clean Water Act

Under the *Clean Water Act* (Part IV), municipalities are responsible for DWSP risk management services. Municipalities may carry out these responsibilities themselves or delegate responsibilities to an appropriate authority. NVSPA carries out these duties/ services on behalf of 10 municipalities through memorandums of understanding (MOU) agreements.

The Risk Management Official is responsible for negotiating and establishing legally binding Risk Management Plans with people who are proposing or are engaged in activities that are a significant threat to sources of drinking water.

The Risk Management Inspector ensures activities are compliant with measures identified in Risk Management Plans and prohibitions through site visits. When warranted, notices and orders can be issued on behalf of the municipalities.

Natural Heritage Services

The Natural Heritage Services Program monitors, tracks, reports and evaluates terrestrial biological data across the watershed. Using the best available science, the program provides an unbiased assessment of current conditions and developing trends.

In line with NVCA's mandate, natural heritage monitoring focuses on NVCA-owned properties to ensure aquatic and terrestrial ecosystems in these properties are protected and can be enhanced, restored or rehabilitated as appropriate.

Conservation Services

Conservation Services engages with the community through environmental education programming, hosting community events, providing passive recreational opportunities and implementing stewardship and restoration projects throughout the watershed.

Conservation Lands

Since 1960, NVCA has secured just over 5,300 hectares of mostly environmentally sensitive areas within the watershed. NVCA's land acquisitions started shortly after the organization was formed, focusing on lands that provided flood management opportunities, natural resources management and recreational opportunities. These historic actions are now proving to have long-term, wide-ranging benefits. NVCA continues to review opportunities to strategically acquire environmentally significant lands throughout the watershed.

In addition to the benefits noted above, lands owned by NVCA also contribute to improved water quality and benefit biodiversity by providing linkages and corridors for wildlife migration. Some of these lands are not open for visitors as they contain significant natural heritage features, natural hazards and other sensitive features, such as provincially significant wetlands.

NVCA's 11 conservation areas ensure that valuable greenspace is protected and that recreational opportunities are provided in safe, well-maintained natural settings so that watershed residents can enjoy a high quality of life.

To ensure compliance under Section 29 of the *CA Act*, NVCA's Board of Directors have designated staff as Provincial Offences Officers. These Provincial Offences Officers monitor NVCA's lands and conservation areas and are often the first point of contact between members of the public and NVCA.

Stewardship Services and Environmental Restoration

NVCA's Stewardship Services and Environmental Restoration Program aims to restore river, wetland, forest and grassland habitats, and support agricultural and urban water quality improvement projects. These projects enhance the ecological health of the watershed and provide enhanced economic and recreational opportunities for local residents and visitors.

The Stewardship Services and Environmental Restoration Program has three main components:

- Providing one-on-one technical and financial assistance to rural and urban landowners,
- Coordination of targeted river restoration initiatives based on priorities identified in the Fisheries Habitat Management Plan (2009), and
- Restoration of wetlands, seeding native grasslands and managing invasive species such as Phragmites.

Engaging community volunteers, businesses and residents in doing meaningful habitat restoration provides a sense of connection and care for the watershed. These projects help reduce the risk to life and property from natural hazards, protect water resources, improve forest conditions, increase biodiversity and make the watershed more resilient to climate change.

The Nottawasaga River Restoration Program focuses on the delivery of strategic multi-partner river restoration projects that enhance habitat for species at risk, including Lake Sturgeon, as well as economically important sport fish, such as rainbow trout and Chinook salmon. Other key objectives include managing rivers as green infrastructure for water quality improvement and flood mitigation.

Stewardship staff also administer and raise funds for the Healthy Waters Grant Incentive Program which provides technical and financial support to landowners interested implementing water quality improvement projects on private property throughout the watershed.

NVCA's tree planting services are delivered on a commercial scale through the Forestry Program, as well as at a community level through the Stewardship Program. Both programs work with funders, municipalities and landowners to plant forests on private and public land across the watershed.

Planting trees helps provide wildlife habitat, shade rivers and streams, reduce erosion and potential future hazards, produces oxygen, among many other benefits. Well-managed forests protect, enhance and restore land by helping to achieve water quality targets, mitigate floods and build resilience to climate change. They also contribute to the economy by providing lumber for construction and wood fiber for products, such as paper.

The Forestry Program also contributes to watershed and community health by implementing best forest management practices, including managing forested land and expanding forest cover. NVCA is now the only agency providing this service at this scale to watershed residents.

Environmental Education

NVCA's Environmental Education Program fosters curiosity about the natural world by setting the seeds for lifelong learning and nature appreciation. By embracing people of all ages and multiple abilities, this program aims to be inclusive and diverse to fulfill the current and future needs of the watershed.

Supporting up to 14,000 participants each year, educators deliver programming to elementary and secondary school students, Specialist High Skills Major students, homeschoolers, students in Tiffin Nature School, day campers, birthday parties, seniors, Guides/Scouts, community events and more.

The overarching goal of NVCA's Environmental Education Program is to help people develop a relationship with the land and water and inspire them to conserve and protect these assets in the future. Educators model how to explore, discover and enjoy nature, then encourage participants to continue these practices on their own time by visiting local green spaces, trails and parks. As the participants spend more time in nature, not only do they become stewards of the land and water, their physical and mental health also improves.

The Environmental Education Program collaborates with multiple partners to provide the best learning opportunities for youth and adults who participate in programming, often at no cost to them thanks to funding and partnerships. The program is designed with the Ontario Ministry of Education curriculum in mind, and has earned a positive reputation through engaging, hands on, environmental and outdoor educational programming.

Corporate Services

Corporate Services includes governance, corporate communications, information services and technology, financial management and human resources. Each of these programs support and facilitate the efficient and effective delivery of other programs and services across the organization.

NVCA relies on transparent financial data and analyses for budget development and long-term planning. Services such as information management, geographic information systems (GIS), communications, risk management, health and safety, asset management and human resources promote best business practices and support corporate economic, social and environmental sustainability.

Governance

The Chief Administrative Officer (CAO) provides expert knowledge, strategic advice and recommendations to the Board of Directors with regard to policy, program and budget decisions. The CAO also provides operational leadership to staff, guiding and influencing processes, decisions and implementation, with the goal of advancing NVCA's mission.

NVCA staff supports board member decision making and leadership by facilitating the participation of municipal members on the Board of Directors. Staff also provide timely professional support, information and recommendations, through meetings with members of the Board of Directors, who guide NVCA into the future.

Corporate Communications

The Corporate Communications Program provides strategic advice and services to inform, inspire, influence and motivate those who live work and play in the watershed to support NVCA's goals and objectives from an integrated watershed management perspective.

Information Services & Technology

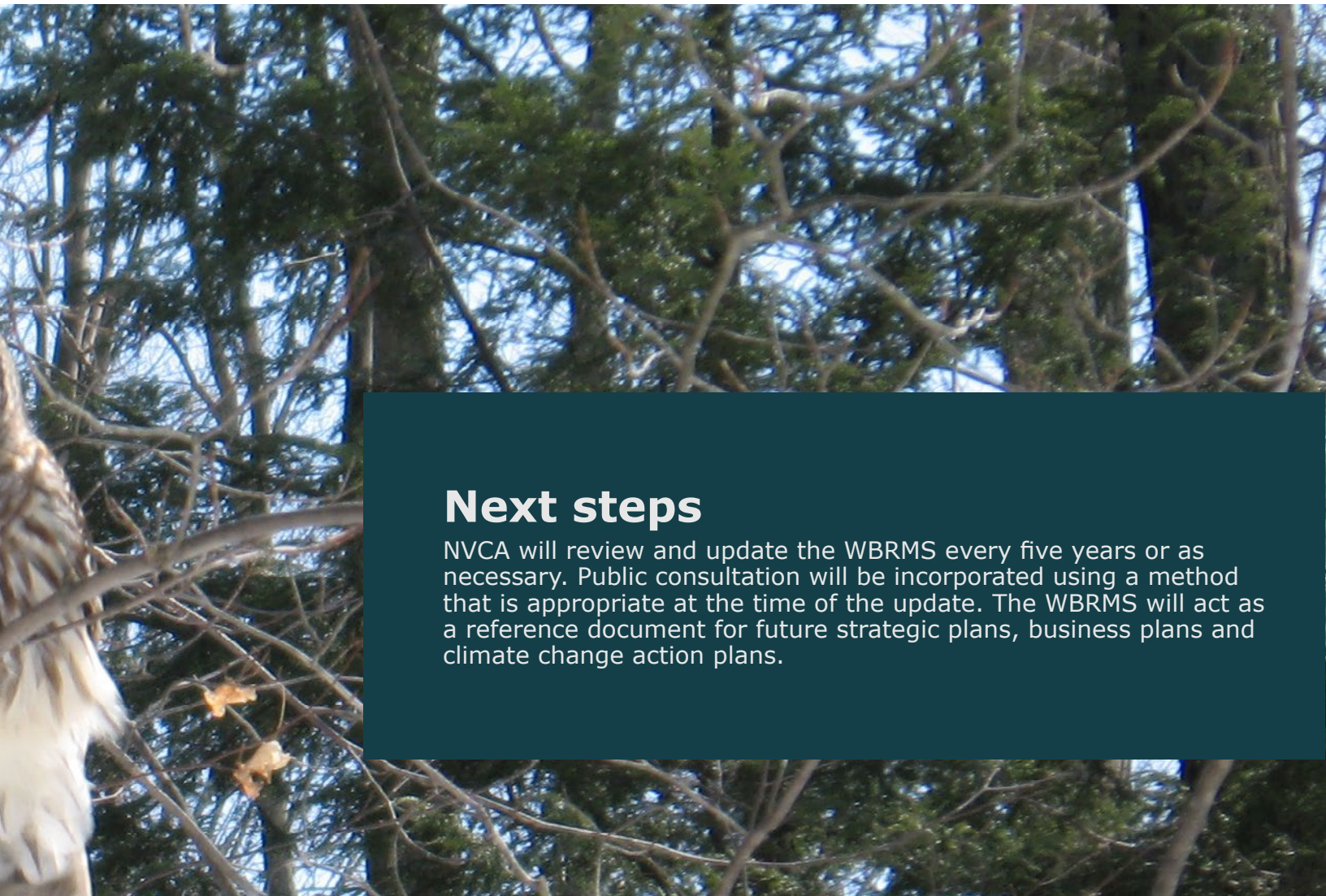
The Information Management and GIS programs are responsible for providing data integrity while managing a secure, reliable and integrated information technology environment that aligns with NVCA's business and strategic goals.

Financial Management

The Financial Management Program is responsible for NVCA's day-to-day financial operations, such as payroll and accounts payable/receivable. Other areas include budgeting, procurement, risk management, legal, quarterly and annual financial reporting, records management, reception and freedom of information requests/ reporting.

Human Resources

The Human Resources Program is responsible for the effective management of people in the organization through the provision of services such as staff recruitment, health and safety, diversity, inclusion and accessibility, employee learning and development, benefit and insurance administration and performance management.



Next steps

NVCA will review and update the WBRMS every five years or as necessary. Public consultation will be incorporated using a method that is appropriate at the time of the update. The WBRMS will act as a reference document for future strategic plans, business plans and climate change action plans.

Appendix A: Funding for Programs and Services

Through the Province of Ontario, NVCA's program areas are separated into three categories:

- Category 1: Mandatory programs and services (*defined in regulation; where municipal levy could be used without any agreement*).
- Category 2: Municipal programs and services provided at the request of a municipality (*with municipal funding through an MOU/agreement*).
- Category 3: Other programs and services an authority determines are advisable (*use of municipal levy requires an MOU/agreement with participating municipalities*).

NVCA operates through three general funding mechanisms:

- Municipal Levy: Levy from municipalities that can be used in Category 1 programs and services without any agreement, or Category 2 and 3 services through an MOU/agreement with participating municipalities.
- Provincial – Funding provided by the Province of Ontario for flood management that must be matched with municipal levy. The Province also provides funding for Source Water Protection.
- Self-Generated – User fees, development charges and grants that support programs of NVCA, the hiring of summer students. These grants can come from the private sector, non-governmental organizations and federal and provincial grants.

The tables below identify the programs and services that are provided by NVCA as well as the funding mechanisms in place for each of these programs.

Natural Hazard Management Program

Program/Service	Description	Category (1,2,3)	Current Funding mechanism
Section 28.1 Permit Administration and compliance activities	Respond to property inquiries. Reviewing and processing of permit applications and associated technical reports under O. Reg, 172/06, site inspections to confirm compliance, communication with applicants, agents, consultants and legal representatives.	1	Municipal Levy Self-Generated
Municipal Plan Input and Plan Review	Provide technical input and advice to municipalities on circulated municipal land use planning applications (Official Plan and Zoning By-law Amendments, Subdivisions, Consents, Minor Variances). Provide input into municipal land-use planning documents (OP, Comprehensive ZB, Secondary plans) related to natural hazards, on behalf of Ministry of Northern Development, Mines, Natural Resources and Forestry (MNMNRF), delegated to CAs in 1983. Provide input into the review and approval processes under other applicable law, with comments principally related to natural hazards, wetlands, watercourses and Section 28 permit requirements.	1	Municipal Levy Self-Generated
Flood & Low Water Forecasting and Warning	Daily data collection and monitoring of weather forecasts, provincial and local water level forecasts, watershed conditions, snow course, flood event forecasting, flood warning, communications and response and equipment maintenance. Annual meeting with municipal flood emergency coordinator. Low water conditions monitoring and analysis. Technical and administrative support to the Water Response Team representing major water users and decision makers who recommend drought response actions. Data collection, mapping, data sets, watershed photography. Development and use of systems to collect and store data and to provide spatial geographical representations of data.	1	Municipal Levy Provincial Self-Generated
Flood and Erosion Control Infrastructure Operation and Management	Flood and erosion control infrastructure operations. (routine activities related to the operation of the structures). Includes five flood control projects and 13 erosion control projects that are annually inspected, and routine maintenance work completed.	1	Municipal Levy Provincial
Flood and Erosion Control Infrastructure Major Maintenance	Flood and erosion control infrastructure operations (routine activities related to the operation of the structures).	1	Municipal Levy Provincial Self-Generated

Program/Service	Description	Category (1,2,3)	Current Funding mechanism
Ice Management Services	Preventative measures associated with the control of ice in areas where there is a chronic problem occurring annually, where there is an increase in the risk to life and property and where there is a method to reduce the possible adverse effects of the ice. The Ice Management Plan is being updated.	1	Municipal Levy Provincial
Technical Studies and Policy Review	Studies and projects to inform natural hazards management programs including floodplain management, watershed hydrology, regulations areas mapping update, flood forecasting system assessment, floodplain policy, Georgian Bay shoreline management.	1	Municipal Levy Provincial Self-Generated
Natural Hazards Communications, Outreach and Education	Promoting public awareness of natural hazards including flooding, drought, and erosion, including attending public events, developing promotional and education materials, social media development and media relations.	1	Municipal Levy Provincial

Provincial Water Quality & Quantity Monitoring

Program/Service and Subservices	Description	Category (1,2,3)	Current Funding mechanism
Provincial Water Quality Monitoring Network (PWQMN)	A long-standing (50+ year) CA/MECP partnership for stream water quality monitoring at 18 sites. Information is used for watershed characterization, Watershed Report Cards, integrated watershed management and stewardship project prioritization.	1	Municipal Levy
Provincial Groundwater Monitoring Network (PGMN)	A long-standing CA/MECP partnership for groundwater level and quality monitoring at 16 well locations. Costs include equipment, well maintenance, data collection, analysis, data management and reporting. MECP funded network installation and continues to fund equipment replacements. Data collected supports flood forecast and warning, low water response, and water quality monitoring.	1	Municipal Levy Self-Generated

Local Water Quality Monitoring

Program/Service	Description	Category (1,2,3)	Current Funding mechanism
Surface Water Quality/ Stream Health Monitoring Program	Surface water quality monitoring uses biological and physical metrics to provide a greater picture of local stream health. Parameters measured include benthic macroinvertebrates, fish, water temperature, fluvial geomorphology, water chemistry and flows. These data are used for Watershed Report Cards, integrated watershed management and stewardship project prioritization.	3	Municipal Levy Self-Generated
Simcoe Groundwater monitoring Program	NVCA monitors groundwater level at 29 well locations.	3	Municipal Levy Self-Generated
Watershed Report Card	Conservation Authorities report on local watershed conditions every five years, under Conservation Ontario's Watershed Report Cards initiative. NVCA reports on the health and trends of its nine sub-watersheds, allowing the public and municipal partners to focuses efforts and tracks progress in their projects.	3	Municipal Levy

Drinking Water Source Protection

Program/Service	Description	Category (1,2,3)	Current Funding mechanism
Drinking Water Source Protection Program (DWSP)	Source Protection Area/Region, technical support, Source Protections Committee support, Source Protection Authority reports and meetings. Activities required by the Clean Water Act and regulations.	1	Provincial
DWSP Risk Management Official	Carrying out Part IV duties of the Clean Water Act on behalf of municipalities through service agreements.	2	Self-Generated

Natural Heritage

Program/Service	Description	Category (1,2,3)	Current Funding mechanism
Natural Heritage Services	Field based monitoring of terrestrial flora and fauna including bird monitoring, invasive species and species at risk.	3	Municipal Levy Self-Generated
Wetland & Natural Heritage Evaluations	Complete wetland evaluations and natural heritage evaluations of NVCA properties.	1	Municipal Levy
Wetland Regulation Mapping	Maintain and update NVCA wetland regulation mapping.	1	Municipal Levy

Conservation Authority Lands and Conservation Areas

Program/Service	Description	Category (1,2,3)	Current Funding mechanism
Section 29 Minister's regulation for Conservation Areas	Undertake Conservation Areas regulations enforcement and compliance initiatives within Conservation Areas to prevent unlawful activity and protect the Authority from exposure to liability under the Occupiers' Liability Act.	1	Municipal Levy
NVCA forests and management areas (not Conservation Areas)	Management and maintenance of CA-owned lands. Includes forest management, signage, gates, passive recreation, stewardship/ restoration, carrying costs such as taxes and insurance.	1	Municipal Levy
Conservation Areas	Management and maintenance of 11 conservation areas and over 30km of recreational trails. Includes passive recreation, risk management program, hazard tree management, gates, fencing, signage, brochures, communications, pedestrian bridges, trails, parking lots, picnic tables, pavilions, roadways, stewardship/ restoration, carrying costs such as taxes and insurance.	1	Municipal Levy Self-Generated
Conservation Area Major Maintenance	Major maintenance and capital improvements to support public access, safety, and environmental protection such as parking lots, pedestrian bridges, boardwalks, trails.	1	Municipal Levy
Land acquisition	Strategic acquisition of environmentally significant properties as per NVCA's 2020 Land Securement Strategy.	3	Municipal Levy
Inventory of Conservation Authority lands	The land inventory includes the following information: location as well as date, method and purpose of acquisition, land use. One-time project with updates as properties are acquired or disposed of and details of agreement and/or tax programs (if applicable) (MFTIP, CLTIP).	1	Municipal Levy

Program/Service	Description	Category (1,2,3)	Current Funding mechanism
Strategy for CA owned or controlled lands and management plans	This strategy includes the management and use of CA-owned or controlled properties including guiding principles, objectives, land use, natural heritage, classifications of lands, mapping, identification of programs and services on the lands, public consultation, publish on website. One-Year Project.	1	Municipal Levy
Land Acquisition and Disposition Strategy	A policy to guide the acquisition and disposition of land in order to fulfill the objects of the authority. Current Land Securement Strategy runs from 2020 to 2030.	1	Municipal Levy
Events	Includes weddings, corporate events, private gatherings, etc.	3	Municipal Levy Self-Generated
Festivals	Includes public events (e.g. Spring Tonic, Festival at Fort Willow, etc.)	3	Municipal Levy Self-Generated

Stewardship Services and Environmental Restoration

Program/Service and Subservices	Description	Category (1,2,3)	Current Funding mechanism
Private Land Stewardship Program	Work with property owners and environmental groups to mitigate flood and erosion hazards, protect water quality, restore floodplains, reduce nutrient contamination, restore wetlands, manage non-native invasive species, protect groundwater, improve aquatic species at risk habitat and promote climate change mitigation and adaptation. Coordinate targeted river restoration and fish habitat improvement initiatives using information generated by the Watershed Science department to identify priority sites and restoration techniques. Apply for and manage external funding, promote private land stewardship, provide technical advice and design support and funding assistance.	3	Municipal Levy Self-Generated
CA owned Land Stewardship Program	Work to mitigate flood and erosion hazards, protect water quality, restore floodplains, reduce nutrient contamination, restore wetlands, manage non-native invasive species, protect groundwater, improve aquatic species at risk habitat and promote climate change mitigation and adaptation on CA owned lands. Coordinate targeted river restoration and fish habitat improvement initiatives using information generated by the Watershed Science department to identify priority sites and restoration techniques.	1	Municipal Levy Self-Generated
Tree Planting and Forestry Services on Private Land	Forestry services including planting plan development, site preparation, tree and shrub planting, and survival assessments. Private woodlot stewardship, technical assistance, link to funding programs to maintain form and function of watershed forest cover.	3	Municipal Levy Self-Generated

Conservation Education and Community Outreach

Program/Service and Subservices	Description	Category (1,2,3)	Current Funding mechanism
School programs	Curriculum-based education programs for pre-school, elementary and secondary students. These programs focus on local watersheds, ecosystems, and environmental issues. Community environmental educational opportunities such as climate change that is suitable for all ages and abilities.	3	Self-Generated Municipal Levy
Community programs and events	Education, day camp, outreach programs and community events to assist in achieving the objectives of the conservation authority. Some of these programs are open to people of all ages and abilities.	3	Self-Generated Municipal Levy

Support Services

Program/Service	Description	Category (1,2,3)	Current Funding mechanism
Corporate Services	Administrative, human resources, financial, operating and capital costs which are not directly related to the delivery of any specific program or service, but are the overhead and support costs of a conservation authority. Includes the health and safety program, overseeing programs and policies.	1	Municipal Levy Self-Generated
Financial Services	Annual budget, accounts payable and receivable, payroll, financial analysis, financial audit, administration of reserves and investments, financial reports for funding agencies, preparing and submitting reports to CRA, benefits program administration.	1	Municipal Levy Self-Generated
Legal Expenses	Costs related to agreements/contracts, administrative by-law updates	1	Municipal Levy
Governance	Supporting CA Boards, Advisory Committees, Office of CAO and Senior Management.	1	Municipal Levy
Communications and Outreach	Informing public of NVCA programs and projects through media, open houses, public meetings, website administration, responding to inquiries from the public, crisis communications.	1	Municipal Levy
Administration Buildings	Office buildings and workshop used to support NVCA staff, programs and services. Includes utilities, routine and major maintenance, property taxes.	1	Municipal Levy
Information Technology Management/GIS	Data management, records retention. Development and use of systems to collect and store data and to provide spatial geographical representations of data.	1	Municipal Levy Self-Generated

Program/Service	Description	Category (1,2,3)	Current Funding mechanism
Vehicle and Equipment	A fleet of vehicles and equipment to support the work of NVCA, including capital purchases, fuel, licenses, repairs and maintenance. Programs and projects are charged for the use of the vehicles and equipment.	1	Municipal Levy
All Program areas	Asset Management Services	1	Municipal Levy

Appendix B: Summary of Studies

Below is a list of existing technical studies, monitoring programs and other information on the natural resources in the Nottawasaga Watershed. Please contact NVCA to access these documents.

- NVCA Integrated Watershed Management Plan – Characterization Report
- NVCA Integrated Watershed Management Plan – Watershed Issues & Strategy Development
- 2023 Watershed Health Checks
- 2023 Watershed Report Cards
- Watershed Monitoring Strategy – Surface Water Discipline
- Land Securement Strategy
- 60 years of forest change in the Minesing Wetlands (1953-2013)
- Hydrogeochemical characterization of the eastern Minesing Wetlands (2014 report)
- Minesing Wetlands Flora and Fauna Biological Inventory (2007 report)
- Watershed Plan
- Watershed Plan Strategic Review 2006
- Black Ash Creek Subwatershed Plan
- Black Ash Creek Subwatershed Plan Figures 1-6
- Black Ash Creek Appendices
- Innisfil Creek Subwatershed Plan
- Innisfil Creek Appendices A-C
- Innisfil Creek Appendices D
- Innisfil Creek Appendices G
- Innisfil Creek Subwatershed Maps 1-6
- Innisfil Creek Subwatershed Maps 7-11
- Willow Creek Subwatershed Plan
- Willow Creek Subwatershed Maps 1-4
- Willow Creek Subwatershed Maps 5-8
- Willow Creek Subwatershed Plan Appendices
- Watershed Hydrology (MacLaren Study) – Report Text
- Watershed Hydrology (MacLaren Study) – Basin Figure
- Watershed Hydrology (MacLaren Study) – Appendix Design Flow

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Member of
Conservation ONTARIO
Natural Champions

Staff Report: 37-08-24-BOD

Date: 22/11/2024

To: Chair and Members of the Board of Directors

From: Kyra Howes
Director, Conservation Services

SUBJECT: Updated 2025 Conservation Services Fees

Recommendation

RESOLVED THAT: The Board of Directors receive Staff Report No. 37-08-24-BOD regarding proposed 2025 and select 2026 changes to Conservation Services fees, and;

FURTHER THAT: the Fee Schedule, which includes Appendices A to C be approved as attached.

Purpose of the Staff Report

The purpose of this report is to provide an overview of recommended changes for NVCA's Conservation Services programs fees. The attached Fee Schedule (Appendices A-C) identifies changes in available programs or services.

Staff are currently reviewing fees associated with NVCA's planning and may submit a report for the Board's review in December 2024, should the provincially mandated fee freeze be lifted.

Background

NVCA's Conservation Services program provides a variety of programs and services to watershed residents and visitors through a fee-for-service basis. Services include environmental education, forestry, events and recreational opportunities.

The revenues that are generated through these programs are used to reduce the overall levy funds required by member municipalities to support staffing, lands and infrastructure and are applied to general ownership costs, such as maintenance, health/safety, and infrastructure improvements.

Issues/Analysis

As per requirements set out in the *Conservation Authorities Act*, staff review all Conservation Services fees on a regular interval. The fee review included reviewing all associated costs required with delivering the services. NVCA staff have undertaken a review of comparable services and adjusted fees to reflect changes in costs associated with implementation as well as market trends and comparables.

The majority of fees changes were based on the average 2023-24 Cost of Living Allowance (COLA) of 3.1%.

NVCA's Environmental Education Program is almost exclusively supported by user fees and externally generated revenues. NVCA staff strive to ensure user fees are competitive yet reflect the cost of delivering high quality programs and services.

The majority of wedding bookings take place two years out, which requires staff to project booking costs on a longer planning horizon than other event schedules. As such, wedding rental fees for 2026 have been included during this review.
All other 2026 Conservation Services Fees will be reviewed in 2025.

Relevance to Authority Policy/Mandate

Section 21.2(4) of the *Conservation Authorities Act* states an authority may charge a fee for a program or service it provides and if no amount is prescribed, the amount is to be determined by the authority.

Impact on Authority Finances

The proposed fee increases may see an increase of $25,000-$30,000 per year based on projected annual delivery of services. This increase will ensure a continued high level of service provided by the Conservation Services program.

Fees processed by credit may incur a processing service charge.

Climate Change Implications

There are no climate change implications related to this report.

Reviewed by:
Original Signed by
Kyra Howes
Director, Conservation Services

Approved for submission by:
Original Signed by
Doug Hevenor
Chief Administrative Officer

Attachment:
Conservation Services 2025 Fee Schedule Appendices A-C

Conservation Services Department Fee Schedule

Appendix A: Conservation Lands Fee Schedules

Category	2024 Fees	2025 Fees	2026 Fees
Conservation Areas			
Day Use Permit (per vehicle)	$10/vehicle	$10/vehicle	
Seasonal Day Use	$70/vehicle	$70/vehicle	
Hunting - Watershed Resident (annual)	$75.60/person	$78/person	
Hunting – Non-Watershed Resident (annual)	$129.60/person	$134/person	
Fishing (annual)	$54.00/person	$56/person	
Bus parking	$50/bus	$100/bus	
Corporate pass (calendar year)	$200	$300	
Rentals			
Group Camping (Tiffin)	$10.80/person (min $200)	$11/person (min $220)	
New Lowell / Tottenham	N/A	N/A	
Weddings (peak season)	$6,960	$8,000	$8,250
Weddings (off-peak)	$5,950	$6,865	$7,080
Ceremony-only	$1,500	$2,000	
Single Day (evening event)	$2,380	$2,500	
Single Day (day-time)	Varies ($530-$1,000)	Varies ($600-$1,300)	
Pavilion rentals	$216	$300	
Day Rental (south lab)	$108	$200	
Day Rental (outdoor classroom)	$108	$200	
Cabin Rental	$216	$300	
Fort Willow Wedding Ceremony	$940	$1,500	
Fort Willow Pavilion Rental	$108	$200	
Photography Permit (annual pass)	$162	$160	
Photography Permit (special events)	$162	$167	
Photography Permit (single family)	$54	$56	
Photography Permit (daily session)	$108	$111	
Rental add-ons			
Extra time (pre-arranged)	$80/hr	$160/hr	
Extra time (not pre-arranged)	$50/half-hour	$160/half-hour	
Cleaning fee	Varies	$160	
Black chair rental for ceremonies	$100	$200	
Other			
Maple Syrup	Varies ($3.75-$30.00)	Varies ($3.75-$30.00)	

HST is charged on Conservation Lands fees. A service fee of up to 2.9% + $0.30 is applicable for programs with external registration.

Appendix B: Environmental Education Fee Schedules

Category	2024 Fee	2025 Fees
Education Fees		
Full Day (onsite)	$16.75/student ($335 min)	$17.30/student ($346 min)
Half Day (onsite)	$11.65/student ($233 min)	$12/student ($240 min)
Outreach 100 Minutes – 1 class 200 Minutes – 2 classes 300 Minutes – 3 classes	Varies: $10.60/student to $21.90/student ($212 min) + mileage	$14.30/student* $9.50/student* $7.90/student* *Plus mileage
SHSM - Full Day	$54.00/student ($810 min)	$55.70/student ($836 min)
SHSM - Half Day	$32.40/student ($486 min)	$33.40/student ($501 min)
SHSM – 1.5 days	$75.60 ($1,134 min)	$77.95 ($1,169 min)
Events		
Birthday Parties	Varies ($250-$400)	Varies ($258-$412)
Birthday Party add-ons: extra time (extra participant)	$113.40 ($10.25)	$117 ($10.60)
Public Outreach - Full Day (outreach)	Varies ($432-$810)	Varies ($445-$835)
Public Outreach - Half Day (outreach)	Varies ($265-$486)	Varies ($273-$500)
Nature School		
Half Day - 12 week prgm	$280.85-$291.50	Varies $297
Full Day - 12 week prgm	$540-$561	Varies $606
Homeschool		
Half Day - 3 week	$40.25	$41.50
Full Day - 3 week	$58.25	$60
Full Day drop off - 3 week	$95.30	$98
Camp		
PD Day Camp	$48.60	$50
Camp Tiffin (week)	$232.20	$240
Extended Care	$8.65	$8.90
Other		
Borrow an Outdoor Educator (1.5hrs/14 ppl)	$167.45	$173
Extra Educator (Low Ropes, Amazing Race, Grade 5 Green Energy and Grade 8 Water Systems) Half-day	$190	$196
Extra Educator (Low Ropes, Amazing Race, Grade 5 Green Energy and Grade 8 Water Systems) Second Half-day	$336	$346
Campfire (min. 3 hr)	$50/hr	$100/hr

HST is applicable to Education Program fees Grade 9+. A service fee of up to 2.9% + $0.30 is applicable for programs with external registration.

Appendix C: Forestry Fee Schedules

Category	2024 Fee	2025 Fee
MFTIP		
Plans and Certification	Varies ($510-2,500)	Varies ($525-2,575)
Arbour Day		
Tree Sales	$35	$35
Tree Planting		
Planting and site preparation	$0.35-1.80/tree	$0.35-1.85/tree

HST is charged on Forestry fees.

Staff Report: 38-08-24-BOD

Date: 22/11/2024

To: Chair and Members of the Board of Directors

From: Dalia Al-Ali
Manager, Engineering Services

SUBJECT: **Award of Contract for Request for Proposal (RFP) #01/2024**

Recommendation

RESOLVED THAT: the Board of Directors receive Staff Report No. 38-08-24-BOD regarding the award of a contract for the completion of the scope of work presented in Request for Proposal (RFP) #01/2024.

Purpose of the Staff Report

The Staff Report will present the recent results from the Request for Proposal (RFP) issued by NVCA for the completion of safety reviews and other studies related to flood management structures. RFP #01/2024 was issued in early October for the completion of studies related to New Lowell Dam (Clearview Township), Utopia Dam (Essa Township), Black Ash Creek Floodway (Town of Collingwood), and the two Tiffin Pond Dams (Essa Township).

Background

NVCA's Asset Management Plan for 2024 includes budget allocations for the completion of activities relating to five flood management structures within the watershed: New Lowell Dam, Utopia Dam, Black Ash Creek Floodway, Tiffin Pond Dam #1 and Tiffin Pond Dam #2. As a result, NVCA issued a Request for Proposal

(RFP) in early October seeking consulting services for the completion of the following scope of work:

- Safety Review (Phase 1) for Utopia Dam in Essa Township;
- Safety Review (Phase 1) for Black Ash Creek Floodway in Town of Collingwood;
- Safety Review (Phase 1) for Tiffin Pond Dam #1 in Essa Township;
- Safety Review (Phase 1) for Tiffin Pond Dam #2 in Essa Township;
- Preliminary Assessment of Decommissioning for New Lowell Dam in Clearview Township.

RFP #01/2024 closed on October 25, 2024 and only one proposal was received by NVCA staff from D.M. Wills Associates Limited.

Issues/Analysis

NVCA staff have awarded the contract associated with RFP #01/2024 to D.M. Wills Associates Limited based on the following factors:

- D.M. Wills' experience in assessing and meeting deliverables for flood structures in NVCA's watershed over the past 5+ years, including the Pretty River Dike Safety Inspection (Phase 1) in 2023-2024 and the New Lowell Dam Safety Review (2019) and subsequent Emergency Inspection (2023);
- D.M. Wills' proposal met all the submission requirements outlined in NVCA's RFP document;
- Following the receipt of D.M. Wills' proposal on October 25, D.M. Wills readily cooperated with NVCA staff to revise the scope for the only item which exceeded the budget available for its completion (the Preliminary Assessment of Decommissioning for New Lowell Dam), thus allowing NVCA to remain within budget for all items within the scope of RFP #01/2024.

Relevance to Authority Policy/Mandate

NVCA has a mandated role to operate and maintain flood management structures within the watershed, including the structures in the scope of RFP #01/2024, under O. Reg. 686/21: Mandatory Programs and Services of the Conservation Authorities Act. One of the components of the responsible management of these structures is the completion of third-party inspections and studies to assess their structural and safety elements.

Impact on Authority Finances

A total of $105,000 is available through NVCA's 2024 Asset Management Plan for the flood management structure studies identified in RFP #01/2024. An additional $10,000 was provided by the 2024-25 WECI Program for the completion of the Preliminary Assessment of Decommissioning for New Lowell Dam, and that grant was

matched with another $10,000 through a draw on reserves as approved by the Board of Directors in October (refer to Staff Report 30-07-24-BOD for additional context on the 2024-25 WECI grant).

The final scope of work agreed upon by NVCA and D.M. Wills will ensure that NVCA will remain within the available budget ($125,000, inclusive of taxes) for the flood structure studies outlined in this Staff Report.

Climate Change Implications

This report has no climate change implications.

Reviewed by:

Original Signed by
Chris Hibberd
Director Watershed
Management Services

Approved for submission by:

Original Signed by
Doug Hevenor
Chief Administrative Officer

Staff Report: 39-08-24-BOD

Date: 22/11/2024

To: Chair and Members of the Board of Directors

From: Dalia Al-Ali
Manager, Engineering Services

SUBJECT: **Review and Approval of Natural Hazard Infrastructure & Ice Management Plans**

Recommendation

RESOLVED THAT: the Board of Directors receive Staff Report No. 39-08-24-BOD regarding the mandated Natural Hazard Infrastructure Operational Plan and Ice Management Plan, and;

FURTHER THAT: the Board of Directors approve both plans as presented.

Purpose of the Staff Report

The purpose of this Staff Report is to present the final Natural Hazard Infrastructure Operational Plan and Ice Management Plan to the Board. In addition, the Staff Report seeks the Boards approval of both plans to enable NVCA staff to meet the legislated timelines noted in Ontario Regulation O. Reg. 686/21 Mandatory Programs and Services under the Conservation Authorities Act, R.S.O. 1990.

Background

The legislated requirement for conservation authorities to develop Natural Hazard Infrastructure Operational Plans and Ice Management Plans is governed by Ontario

Regulation O. Reg. 686/21: Mandatory Programs and Services under the Conservation Authorities Act, R.S.O. 1990.
Section 4 of the aforementioned legislation mandates NVCA to develop, implement and maintain an Ice Management Plan as one of the requirements for regulating the risks from natural hazards. Meanwhile, Section 5 of the legislation mandates that NVCA develop, implement and maintain a Natural Hazard Infrastructure Operational Plan as one of the requirements for ensuring any infrastructure owned or maintained by the authority is responsibly operated, maintained, repaired and/or decommissioned.

O. Reg. 686/21 mandates that both plans be developed on or before December 31, 2024.

Issues/Analysis

To ensure consistency with the legislated plans being developed by other conservation authorities, NVCA staff communicated with their counterparts at CAs and also reviewed materials and presentations circulated by Conservation Ontario.

The Ice Management Plan appended to the Staff Report is focused on establishing clear roles and responsibilities when it comes to NVCA's role in the prediction, management and response to potential ice jams within the watershed. Ice occurrence in watercourses and the subsequent potential for ice jams present an increased risk of natural hazards in NVCA's watershed, primarily through their possible contribution to localized flooding. The Ice Management Plan also presents actions taken by NVCA staff related to the seasonal monitoring of potential ice jam locations, and future ice management objectives being prioritized by the Engineering team. Importantly, the Plan also details the roles and responsibilities of municipal partners in the response to flooding and flood-related emergencies which may result from ice jams.

The Natural Hazard Infrastructure Operational Plan appended to the Staff Report outlines the NVCA's roles and responsibilities in operating and maintaining seven flood management structures within the watershed: Tottenham Dam (Town of New Tecumseth), New Lowell Dam (Clearview Township), Utopia Dam (Essa Township), Pretty River Dike (Town of Collingwood), Black Ash Creek Floodway (Town of Collingwood), Tiffin Pond Dam #1 and Tiffin Pond Dam #2 (Essa Township). In addition, the Plan identifies critical information for ensuring the continued provision of services by NVCA related to the operation and maintenance of flood management structures. This information includes location, access, structure capacity, design criteria, operational procedures, and Emergency Preparedness Plans (where applicable) for each of NVCA's flood management structures.

Relevance to Authority Policy/Mandate

As noted, O. Reg. 686/21: Mandatory Programs and Services under the Conservation Authorities Act mandates that CAs develop Ice Management Plans (Section 4) and Natural Hazard Infrastructure Operational Plans (Section 5) on or before December 31, 2024. Both plans are appended to this Staff Report for the Board's review and approval prior to the mandated deadline.

Impact on Authority Finances

The development of the Natural Hazard Infrastructure Operational Plan and Ice Management Plan was completed by NVCA staff internally. It is anticipated that future updates of both plans will be completed in a similar manner. At this point in time, it is not anticipated that the update or maintenance of these plans will result in an impact on NVCA's finances.

Climate Change Implications

This report has no climate change implications.

Reviewed by:

Original Signed by
Chris Hibberd
Director Watershed
Management Services

Approved for submission by:

Original Signed by
Doug Hevenor
Chief Administrative Officer

Attachments:

1. Natural Hazard Infrastructure Operational Plan
2. Ice Management Plan

NVCA NATURAL HAZARD INFRASTRUCTURE OPERATIONAL PLAN

November 2024

Nottawasaga Valley Conservation Authority

Table of Contents

Introduction

Project Description

The purpose of creating the Natural Hazard Infrastructure Operational Plan is to establish a comprehensive framework for managing and mitigating the risks associated with natural hazards. This plan is developed in accordance with Ontario Regulation 686/21 of the *Conservation Authorities Act* and ensures compliance with provincial standards and guidelines. By outlining clear protocols and procedures, the Plan effectively assigns roles and responsibilities to all agencies involved and fosters collaboration and coordination among stakeholders. This structured approach enhances the overall response to natural hazards to improve the safety and resilience of the communities affected by such events.

Overview of Ontario Regulation 686/21: Mandatory Programs and Services

The Natural Hazard Infrastructure Operational Plan is governed by the Ontario Regulation O. Reg. 686/21: Mandatory Programs and Services under the *Conservation Authorities Act*, R.S.O. 1990, c. C.27. As outlined in Section 5, this regulation mandates that conservation authorities provide essential programs and services for the operation, maintenance, repair, and decommissioning of infrastructure they own or manage. As part of this program, it is required that conservation authorities develop and implement an operational plan on or before December 31, 2024.

O. Reg. 686/21 Infrastructure

5. (1) Subject to subsection (3), an authority shall provide programs and services that support the operation, maintenance, repair and decommissioning of the following types of infrastructure the authority owns or manages:

1. *Any water control infrastructure, the purpose of which is to mitigate risks to life and damage to property resulting from flooding or to assist in flow augmentation.*
2. *Any erosion control infrastructure.*

(2) Programs or services provided under subsection (1) shall include the following components:

1. ***The development and implementation of an operational plan on or before December 31, 2024.***
2. *The development and implementation of an asset management plan on or before December 31, 2024.*
3. *The undertaking of any technical or engineering studies necessary to ensure the proper operation and maintenance of the infrastructure to which the program or service applies.*

(3) If an authority enters into an agreement with an owner of infrastructure mentioned in paragraph 1 or 2 of subsection (1) to manage the infrastructure on the owner's behalf, the authority shall provide the programs and services to operate, maintain, repair and decommission the infrastructure only in accordance with its obligations under the agreement.

(4) An authority may update the plans mentioned in paragraphs 1 and 2 of subsection (2), from time to time, as the authority considers it advisable.

NVCA Natural Hazard Infrastructure

The following infrastructure requires an operational plan to ensure effective management and maintenance:

- Tottenham Dam, Town of New Tecumseth;
- New Lowell Dam, Township of Clearview;
- Utopia Dam, Essa Township;
- Pretty River Dike, Town of Collingwood;
- Black Ash Creek Floodway, Town of Collingwood;
- Tiffin Pond Dams ("Momma Bear Pond Dam" and "Poppa Bear Pond Dam"), Essa Township.

Each of these infrastructure features play a critical role in flood mitigation, water management, and environmental conservation within their respective areas. The operational plan will outline specific procedures for the operation, maintenance, and monitoring of these structures, ensuring compliance with regulatory standards and enhancing community safety.

Tottenham Dam, New Lowell Dam, Utopia Dam, and the Tiffin Pond Dams are owned, operated, and maintained by the Nottawasaga Valley Conservation Authority (NVCA). The Black Ash Creek Floodway and Pretty River Dike are maintained by NVCA but involve joint land ownership and/or easement provisions between NVCA and the Town of Collingwood.

Best Management Practices

This Natural Hazard Infrastructure Operational Plan incorporates best management practices from key organizations, including the Canadian Dam Association (CDA) and the *Lakes and Rivers Improvement Act*, R.S.O. 1990, c. L.3, ensuring the safe and sustainable operation of infrastructure.

In alignment with the CDA's 2007 Dam Safety Guidelines (2013 Revision), the plan establishes a comprehensive inspection schedule that recommends routine and regular inspections, within reason, to identify potential changes in dam performance, such as debris build-up, leaks, or structural issues like cracking or erosion, annual or semi-annual visual inspections to detailed assessments, covering earth embankments, geotechnical features, and concrete structures, with qualified

professional engineers documenting deficiencies and recommending necessary actions for repairs or further monitoring, and special inspections that are triggered by unusual or extreme events, such as heavy rainfall or flooding, and are performed by qualified professionals to assess any impact on dam safety.

The plan also complies with the *Lakes and Rivers Improvement Act*, R.S.O. 1990, c. L.3 that similarly promotes the Owner's obligation to perform inspections, within reason, to ensure long-term sustainability and safety in infrastructure operations. The following section is stated within the *Lakes and Rivers Improvement Act*, R.S.O. 1990, c. L.3:

> *Owner's obligation*
>
> *(3) The owner of a dam or proposed dam shall permit and facilitate an inspector or an engineer, in the course of carrying out his or her duties, to,*
>
> *(a) enter and inspect, at any reasonable time, any place, structure or land under the control of the owner, other than a private dwelling; and*
>
> *(b) inspect any document, data or thing under the control of the owner. 1998, c. 18, Sched. I, s. 33; 2006, c. 19, Sched. P, s. 2 (2).*

These recommendations and best management practices are reflected in later sections under this plan.

Natural Hazard Infrastructure

Level of Service

The key NVCA natural hazard infrastructure, including Tottenham Dam, New Lowell Dam, Utopia Dam, Pretty River Dike, Black Ash Creek Floodway, and Tiffin Pond Dams, are designed to operate at a basic to standard level of service, ensuring they meet essential safety and functionality requirements with minimal intervention. This approach emphasizes low operational demands, relying primarily on routine inspections to identify any maintenance needs or potential issues.

NVCA Roles and Responsibilities

The Nottawasaga Valley Conservation Authority has roles and responsibilities focused on the management and oversight of each of its natural hazard infrastructure. These tasks ensure the safety, compliance, and operational effectiveness of the infrastructure while encouraging collaboration with municipal partners.

- **Maintain Access to the Site:** Ensure that all necessary access points to the infrastructure are clear, operational and usable for conducting regular inspections and addressing potential infrastructure-related emergencies.
- **Update the Operation, Maintenance, and Surveillance Manuals (where applicable):** Regularly revise manuals for formal dam structures to

reflect current practices and safety protocols based on the latest Canadian Dam Association guidance and any relevant legislation.

- **Conduct and Maintain Record of Monthly and Annual Inspections:** Perform scheduled inspections to monitor the condition and performance of the infrastructure, and document findings for future reference.
- **Perform Third-Party Engineering Inspections and Dam Safety Reviews:** Coordinate with external experts to conduct thorough evaluations and reviews of dam safety and infrastructure integrity.
- **Communicate with Municipal Partners During Emergencies:** Establish clear communication channels to inform municipal partners of any emergency situations promptly.
- **Update the Natural Hazard Infrastructure Operational Plan Annually:** Review and update the Operations Plan each year to ensure it remains relevant and effective in addressing potential risks and operational needs.

1. Tottenham Dam

Location

The Tottenham Dam is situated in the community of Tottenham, within the Town of New Tecumseth, Simcoe County, Ontario. Specifically located at the outlet of Tottenham Pond on Beeton Creek, it can be found on Lot 4, Concession III in the Township of New Tecumseth. The dam's UTM coordinates are 5164123.08 North and 605999.64 East. It plays a crucial role in managing water flow, as it outlets to Beeton Creek, which eventually discharges into the Nottawasaga River through Bailey and Innisfil Creeks. The Nottawasaga River further discharges into Georgian Bay at Wasaga Beach. Historically, the site was home to a grist mill located on the downstream right side of the dam; however, this structure was destroyed by fire in 2004. Despite this, the partially decommissioned intake structure remains.

Figure 1. Tottenham Dam and reservoir.

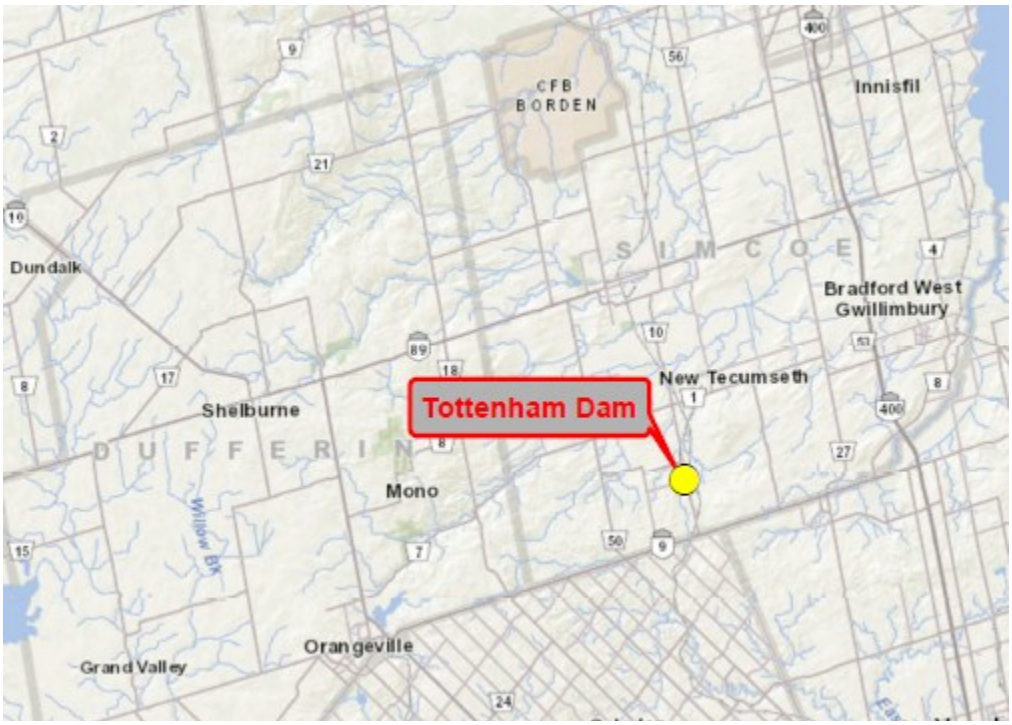

Figure 2. Location of Tottenham Dam in the Town of New Tecumseth (credit: D.M. Wills, July 2020).

Access

The dam can be reached from the Town of Alliston by heading south along Tottenham Road (Regional Road 10) to the community of Tottenham. Access to the dam is gained via Mill Street, west of the community of Tottenham within the Tottenham Conservation Area.

Purpose

The original purpose of the dam was to supply water to power the gristmill. Its primary purpose is now to control water levels in the reservoir to support recreational activities in the Tottenham Conservation Area, in addition to flood management.

Bank Slope Characteristics

The dam is a 9 m high and 110 m long earth embankment dam with a crest elevation of 253.60 m. The dam has a 30 m long concrete gravity emergency spillway with a crest elevation at 252.70 m.

Dam Capacity and Design Criteria

The Tottenham Dam features a substantial storage capacity of approximately 37 hectare-metres, extending from the base of the dam to the crest of the embankment. The water level in the reservoir is maintained at an elevation of about 251.92 metres by the top of the drop inlet structure, while the low flow gate valve is typically kept partially open to ensure minimal downstream flow. The primary outflow comprises a 1.68 m x 1.68 m concrete drop inlet structure, also

positioned at 251.92 m, and a 0.30 m x 0.30 m low flow valve with an invert elevation of 246.80 m. The reservoir itself spans an area of approximately 9.7 hectares. Table 1 is a summary of key design features.

Table 1. Tottenham Dam design features and measurements.

Design Feature	Measurement
Low Flow Gate Structure	
Invert	246.80 m (809.71 ft)
Dimensions	0.30 m x 0.30 m (1 ft x 1 ft)
Drop Inlet Structure	
Top of Opening	251.92 m (826.51 ft)
Dimensions	1.68 m x 1.68 m (5.51 ft x 5.51 ft)
Outlet Pipe	
Invert	244.60 m (802.49 ft)
Diameter	0.99 m (3.45 ft)
Length	36.00 m (118.11 ft)
Slope	6.1 %
Emergency Spillway	
Crest	252.70 m (829.07 ft)
Length	30.20 m (99.10 ft)

Operational Procedures and Recommendations

The Tottenham Dam is typically not operated on a regular basis, resulting in the absence of formal operational procedures. The only adjustable discharge component is the low flow gate valve, which is generally maintained in a partially open condition. This valve is set to allow a controlled amount of water to enter the top of the drop inlet structure to ensure consistent flow. Specifically, the valve is usually left about 16 turns out of 96, allowing for minimal discharge without significant intervention. Additionally, there is typically no winter drawdown of the reservoir unless it is deemed necessary by the Nottawasaga Valley Conservation Authority (NVCA).

As a result of a recent third-party Dam Safety Review for Tottenham Dam (2021), a list of recommendations to improve the safety and operations of the dam have been provided. The priorities are classified as “Immediate”, “High”, “Medium” and “Low” and are defined as follows:

- *Immediate* – Remedial action that needs to be carried out as soon as possible because the deficiency is an immediate high-risk dam safety hazard with a high likelihood of occurrence of loss of life and /or serious environment and/or serious economic consequences.
- *High* – Remedial action is required within the next 2 years to meet current regulations and/or dam safety requirements and is a high-risk dam safety hazard.

- *Medium* – These items may include additional work that could improve the performance or issues that may become serious dam deficiencies. These items typically should be addressed within five (5) years.
- *Low* – These are opportunities to improve safety or only in the long term may become a serious dam safety deficiency. The recommended remedial action is expected to be required only at least 6 years from now.
- *Ongoing* – These items may need to be reviewed and completed on a regular basis to ensure that the function of the structure and public safety measures is maintained.

The recommendations are prioritized based on the risk of occurrence, significance of potential negative impacts, and resources (cost, time, effort) required for their implementation. **Table 2** provides a summary of these recommendations with their designated priority level.

Table 2. Operational recommendations for Tottenham Dam based on the 2021 Dam Safety Review by D.M. Wills.

Category	**Recommendation**	**Priority**
Hydrotechnical	Undertake a detailed dam breach analysis using an unsteady flow HEC-RAS model to confirm the High HPC for the sunny day and flood dam failure scenarios.	Immediate
Hydrotechnical	Depending on the results of the detailed dam breach analysis referenced in Recommendation 1, review the selection of the IDF and update the hydraulic capacity and freeboard assessments.	Immediate
Hydrotechnical	If, after completing Recommendation 2, the dam is found to have insufficient hydraulic capacity and freeboard, undertake a process by which the dam can be brought into compliance with the Lakes and Rivers Improvement Act (LRIA) Technical Bulletins (MNR, 2011).	High
Hydrotechnical	In conjunction with addressing the other recommendations with respect to the hydraulic capacity of the dam, investigate opportunities to provide permanent erosion protection within the emergency spillway.	Medium
Civil/Structural	Remediate the erosion on the upstream side of the earth embankment and provide erosion protection measures.	Medium
Civil/Structural	Remove all trees on or within 10 m of the earth embankment crest and slopes and remediate their root systems to prevent piping.	Medium
Civil/Structural	Repair/replace the concrete coated gabion basket wall on the downstream right side of the emergency spillway.	Low
Civil/Structural	Remove all trees adjacent to concrete structures.	Medium
Civil/Structural	Consider undertaking further underwater inspection of the low flow valve and concrete structure to determine their condition and whether the noted debris upstream of the valve should be removed.	Low

Civil/Structural	Monitor the wet area downstream of the toe of the dam (former mill tailrace) to confirm the cause of the standing water. Undertake remedial measures, as appropriate.	High
Civil/Structural	Ensure that the dam divestment and decommissioning alternatives are considered prior to any major reconstruction or rehabilitation works at the site.	Low
Civil/Structural	Upon confirmation of the HPC and IDF (Recommendations 1 and 2), update the structural stability assessment for the emergency spillway weir, based on the revised IDF headwater elevations.	Immediate
Civil/Structural	Upon confirmation of the HPC and IDF (Recommendations 1 and 2), undertake a geotechnical field investigation and slope stability assessment to determine if the earth embankment dam meets the requirements of the Lakes and Rivers Improvement Act (LRIA) Technical Bulletins (MNR, 2011).	High
Dam Safety Management	Undertake routine dam inspections throughout all seasons.	High
Dam Safety Management	Add a separate section on the routine inspection form for documenting public and operator safety (fencing, railings, safety boom, etc.).	High
Dam Safety Management	Consider preparing separate routine inspection forms for each dam site.	High
Dam Safety Management	Consider adding a separate section to the annual inspection form dedicated to summarizing the recommendations and requirements for follow-up action.	High
Dam Safety Management	Develop a process and form for undertaking special inspections following unusual or extreme events.	High
Dam Safety Management	Upon confirmation of the HPC and IDF (Recommendations 1 and 2), update the OMSS Manual to meet the recommendations of the Dam Safety Guidelines (CDA, 2007).	Medium
Dam Safety Management	Upon confirmation of the HPC and IDF (Recommendations 1 and 2), update the EPP to meet the recommendations of the Technical Bulletin: Emergency Management for Dam Safety (CDA, 2019).	High
Dam Safety Management	The next Dam Safety Review should be completed in 2031.	Low
Public and Operator Safety	Prepare a Public Safety Risk Assessment (PSRA) in advance of any changes to the public safety measures. The PSRA should be completed in accordance with the Guidelines for Public Safety Around Dams (CDA, 2011).	High
Public and Operator Safety	Subject to the results of the PSRA, prepare a Public Safety Plan to address the hazards identified as part of the PSRA.	High

Public and Operator Safety	Subject to the results of the PSRA and PSP, implement the following changes to the public safety measures at the site: o Install a cover over the stoplog gain of the former mill intake structure and modify/replace the railings with railings or fencing that meets the Ontario Building Code requirements. o Install a gate to block vehicular access to and parking with the emergency spillway. o Consider installing cantilevered fence sections at the ends of the outlet structure wingwalls in order to prevent public access to this area. o Replace all faded, deteriorated and damaged public safety signs and install additional public safety signs on the approaches to the dam to warn members of the public of the hazards before the enter upon any part of the structure.	High
Public and Operator Safety	Consider extending the deck of the catwalk structure over the low flow valve stem when the catwalk structure is rehabilitated/replaced so that dam operators do not need to lean out over the railing while holding the operating device.	Low
Public and Operator Safety	Consider installing a gate in the fencing at the outlet structure to permit dam operator access as well as a railing at the downstream end of the structure.	Low

2. New Lowell Dam

Location

The New Lowell Dam is situated on Coates Creek, specifically on Lot 10, Concession 4, in the Geographic Township of Sunnidale within the Township of Clearview, County of Simcoe, Ontario. The New Lowell Conservation Area, which encompasses the control structure and reservoir, is located at 2894 Hogback Road, New Lowell, with UTM coordinates of 4,911,500 N and 581,500 E. Surrounding the dam, visitors can enjoy recreational amenities, including a campground and park to the southwest, as well as a beach to the northwest. Coates Creek, the tributary that feeds into the reservoir, flows eastward before joining the Mad River, ultimately connecting to the Nottawasaga River within the Minesing Wetlands. The Coates Creek watershed at the New Lowell Dam drains an area of approximately 4,480.22 hectares.

Figure 3. New Lowell Dam and reservoir during summer operations, with the public safety boom in place upstream of the concrete control structure (credit: D.M. Wills, July 5 2023).

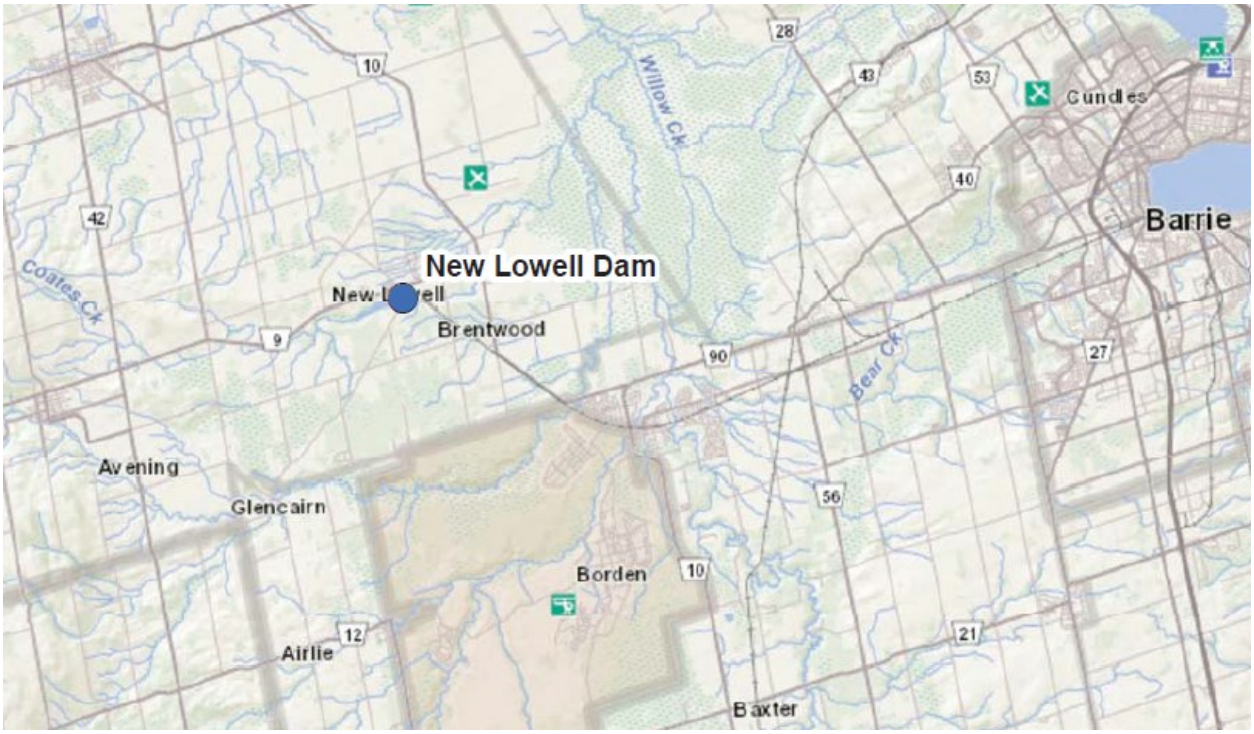

Figure 4. Location of New Lowell Dam in Clearview Township (credit: D.M. Wills, July 2023).

Access

The dam can be accessed on foot from Hogback Road or from a parking lot north of the dam off Clarendon Street.

Purpose

The primary purpose of the dam is to support recreational activities in the broader Conservation Area. In addition, there are flood management benefits provided by the dam and possibly erosion control benefits as well.

Bank Slope Characteristics

The New Lowell Dam is an earth embankment dam spanning 170 metres in length, with a crest width that varies between 5 and 6 metres. The south (left) embankment measures approximately 60 metres, while the north (right) embankment extends about 100 metres. The north embankment features a grassed emergency spillway that is approximately 25 metres wide and 1.2 metres deep that is designed to manage overflow during high water events effectively.

Dam Capacity and Design Criteria

The New Lowell Dam features a main spillway that is a 10-metre-long and 9-metre-high concrete gravity structure, equipped with two stoplog bays, each measuring 4.27 metres wide, along with a low-level gate/valve. This design allows for effective control of flows from the reservoir, which has a surface area of approximately 21 hectares. Without stoplogs installed and excluding tailwater effects, the control structure can convey around 120 cubic metres per second at the elevation of the

deck soffit, which is set at 202.84 metres. **Table 3** is a summary of the key design features.

Table 3. New Lowell Dam design features and measurements.

Design Feature	Measurement
Low Flow Valve	
Dimensions	0.61m x 0.61m (2ft x 2ft)
Emergency Spillway	
Crest	202.26m (663.58ft)
Length	25.00m (82.02ft)
Depth	1.20m (3.94ft)

Operation Procedures and Recommendations

The operation of the New Lowell Dam is conducted by NVCA staff, who adjust the reservoir levels twice a year: lowering it for winter and raising it after the spring runoff. The dam is designed to accommodate a 100-year storm with a design flow of 4.68 cm and is also managed during high flow or emergency situations. Currently, the low flow valve is not operational, but it is crucial for regulating water levels.

In spring, following significant runoff, three stoplogs from each bay are replaced, allowing the reservoir level to rise to the top of the stop logs, referred to as the regulated summer water level. If stoplog replacement is not feasible, the low flow gate valve is opened to maintain stream flow. Conversely, the fall drawdown period runs from November 1 to November 30, during which three stoplogs are systematically removed from each bay in a staggered manner to minimize downstream impacts from excess water flow. This process begins with the removal of one stop log at a time, ensuring that the top log in the opposite bay is above water level before proceeding with additional removals. The low flow gate valve is adjusted during this period to help maintain the summer water level and facilitate the fall drawdown.

As a result of a recent third-party Dam Safety Review for New Lowell Dam (2019, updated in 2023), a list of recommendations to improve the safety and operations of the dam have been provided. The priorities are classified as “Immediate”, “High”, “Medium” and “Low” and are defined as follows:

- *Immediate* – Remedial action that needs to be carried out as soon as possible because the deficiency is an immediate high-risk dam safety hazard with a high likelihood of occurrence of loss of life and /or serious environment and/or serious economic consequences.
- *High* – Remedial action is required within the next 2 years to meet current regulations and/or dam safety requirements and is a high-risk dam safety hazard.

- *Medium* – These items may include additional work that could improve the performance or issues that may become serious dam deficiencies. These items typically should be addressed within five (5) years.
- *Low* – These are opportunities to improve safety or only in the long term may become a serious dam safety deficiency. The recommended remedial action is expected to be required only at least 6 years from now.
- *Ongoing* – These items may need to be reviewed and completed on a regular basis to ensure that the function of the structure and public safety measures is maintained.

The recommendations are prioritized based on the risk of occurrence, significance of potential negative impacts, and resources (cost, time, effort) required for their implementation. **Table 4** provides a summary of these recommendations with their designated priority level.

Table 4. Operational recommendations for New Lowell Dam based on the 2019 Dam Safety Review and 2023 Emergency Inspection Report by D.M. Wills.

Category	**Recommendation**	**Priority**
Hydrology	Update the hydrology study completed as part of the 2011 Dam Breach Study to reflect the most recent estimates of PMP.	Medium
Hydrology	Update the dam breach modelling and inundation mapping to reflect changes in peak flows resulting from the hydrology study update.	Medium
Hydrology	Investigate opportunities to address the significant deficiency in discharge capacity and freeboard.	High
Hydrology	Restore manual staff gauges: o Replace the manual water level gauge on the downstream left wingwall. o Add a water level gauge to the upstream side of the control structure.	Medium
Hydrology	Restore the functionality of the low flow valve, if it is required for operations. o Undertake a CCTV inspection of the low flow pipe and valve system in order to provide additional information prior to undertaking the design and repair. o Complete design, tendering, permitting and construction for the repair of the low flow valve.	High
Civil/Structural	Undertake a detailed condition survey, including concrete coring and underwater inspection, in advance of or as part of the rehabilitation design.	Medium
Civil/Structural	Undertake a detailed structural evaluation in advance of or as part of the rehabilitation design.	Medium
Civil/Structural	Complete a rehabilitation design for the concrete control structure including: o Repair the concrete walls, deck and pier. o Repair the expansion joints. o Repair the broken sections of railing and ensure that all	Medium

	sections are adequately anchored. o Clean and coat (repaint) all painted metal components.	
Civil/Structural	Investigate opportunities to provide additional sliding resistance for the dam.	High
Civil/Structural	Replace the culvert under the main dam access road and add erosion protection on the earth embankment downstream of the culvert.	Medium
Geotechnical	Review the ability of the earth embankment to withstand the erosive forces associated with the Inflow Design Flood and provide permanent erosion protection on the embankment, as required.	High
Geotechnical	Review the latest survey data, or complete new topographic survey, to determine if the emergency spillway and drainage swale are still adequately defined and have sufficient capacity to convey the Inflow Design Flood. If any deficiencies are noted, undertake design and construction to remediate the deficiency.	High
Geotechnical	Erosion protection and gabion baskets: o Enhance the rock protection on the upstream embankments to prevent erosion of the embankment from wave action. o Add erosion protection at the toe of the earth embankment slope within the emergency spillway. o Monitor the gabion basket retaining walls, particularly the erosion behind the upstream left wall, and undertake repairs, as required.	Medium
Geotechnical	Remove all woody vegetation from the earth embankment sections of the dam and from around the wingwalls and remediate root systems.	Medium
Geotechnical	Investigate opportunities to improve the stability of the earth embankment sections.	High
Geotechnical	Reestablish grass or other ground cover vegetation on areas of the embankment with exposed soil.	Medium
Dam Safety Management	Undertake routine dam inspections throughout all seasons.	Low
Dam Safety Management	Add a separate section on the routine inspection form for documenting public and operator safety (fall arrest, fencing, railings, safety boom, etc.).	Low
Dam Safety Management	Consider preparing separate routine inspection forms for each dam site.	Low
Dam Safety Management	Consider adding a separate section to the annual inspection form dedicated to summarizing the recommendations and requirements for follow-up action.	Low
Dam Safety Management	Develop a process and form for undertaking special inspections following unusual or extreme events.	Low

Dam Safety Management	Monitor the headpond and piezometre water levels as part of the routine inspections and develop a headpond water level vs. piezometre water level curve for each piezometre.	Low
Dam Safety Management	Institute a rodent control program to eliminate the rodents on the downstream right embankment. Once the rodents are under control, fill the holes that they have made and restore grass cover in the area. Continue to monitor for future rodent activity and settlement of the embankment in the areas of past rodent holes.	Ongoing
Dam Safety Management	Carry out a video inspection of "North Well C" piezometre to determine if it is still in working condition and if the results recently recorded by the NVCA are representative data.	High
Dam Safety Management	Consider installing new piezometres that are screened within each embankment so that the piezometric conditions associated with the upstream reservoir are measured accurately.	Medium
Dam Safety Management	Measure the water levels in the monitoring wells and record the corresponding headwater and tailwater elevations (measure from a known surveyed benchmark). Develop a spreadsheet to track these readings so that trends can be developed and anomalies can be identified for further investigation.	Ongoing
Dam Safety Management	Implement a system to measure the flow through the sub drain on the downstream right side of the dam. Complete measurements of this flow along with the measurements of the upstream/downstream water levels and well water levels.	Ongoing
Dam Safety Management	Update the OMS Manual to include the results of the latest dam safety and dam breach studies and ensure that the information recommended in the 2007 CDA Dam Safety Guidelines is provided.	Medium
Dam Safety Management	Update the EPP to include the results of the latest dam safety and dam breach studies and ensure that the information recommended in the 2007 CDA Dam Safety Guidelines is provided.	Medium
Dam Safety Management	The next full DSR should be carried out in 2029.	Low
Public Safety	Prepare a PSRA in advance of any changes to the public safety measures (i.e. new signage, safety boom relocation, etc.). The PSRA should be completed in accordance with the Guidelines for Public Safety Around Dams (CDA, 2011).	Medium
Public Safety	Subject to the results of the PSRA, prepare a PSP to address the hazards identified as part of the PSRA.	Medium
Public Safety	Subject to the results of the PSRA and PSP, implement the following changes to the public safety measures at the site: o Relocate the safety boom anchors that are on the control structure away from the control structure to enhance	Medium

	opportunities for self-rescue. o Replace deteriorated signage in accordance with the latest Canadian Dam Association and Ministry of Natural Resources and Forestry sign standards. o Remove the deteriorated sign from the left gate access to the control structure. o Add a sign on the outside of the fence near the end of the downstream right wingwall (similar placement as the one on the left wingwall). o Move the large sign on the inside of the downstream left wingwall to the top of the control structure so that it can be more easily seen from both the left and right directions.	

3. Utopia Dam

Location

The Utopia Dam is situated in Essa Township, specifically within the Hamlet of Utopia, at coordinates 44.327° W latitude and 79.834° N longitude. Nestled within the Utopia Conservation Area, the dam is surrounded by a maintained natural environment, with no development near the reservoir except for the historical grist mill adjacent to the structure. Downstream, Bear Creek meanders through a vegetated corridor, where minimal development exists outside the valley lands.

Figure 5. Utopia Dam and associated reservoir upstream of the dam.

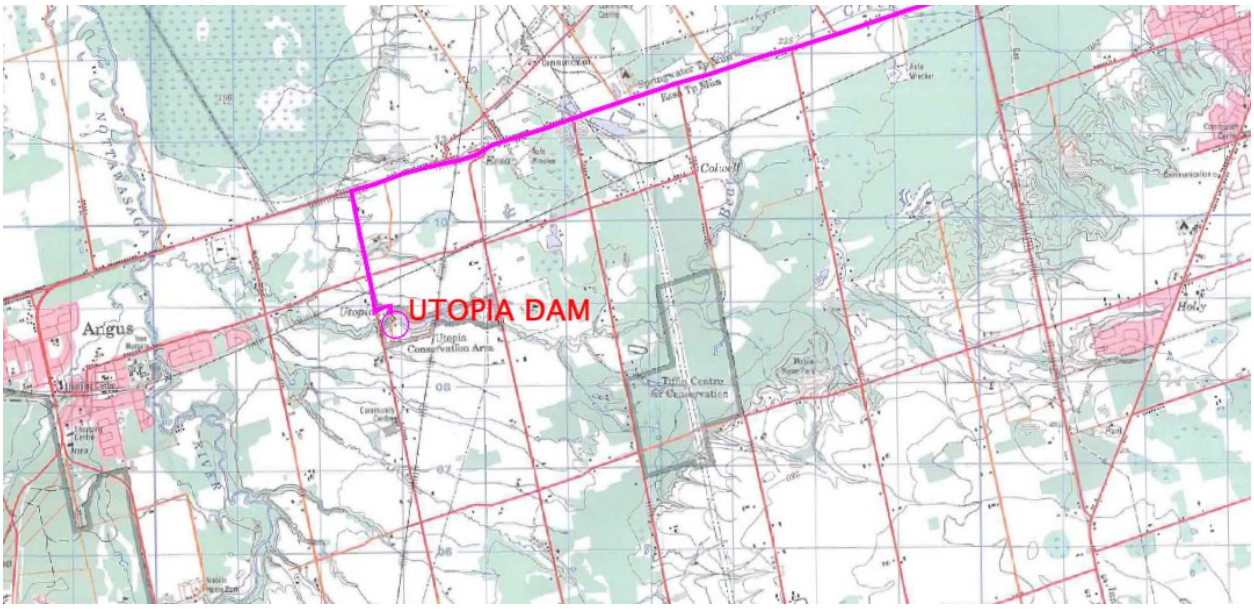

Figure 6. Location of Utopia Dam in Essa Township (credit: Trow Associates, 2008).

Access

The Utopia Dam is located in Essa Township within the Utopia Conservation Area, which can be accessed from both the 6th Line of Essa and Old Mill Road. There is an access gate on Old Mill Road, leading to a grassed road that runs down to the north side of the dam. Additionally, vehicles can cross over the spillway, which functions as the access road, allowing access directly from the 6th Line of Essa. The road that descends along the heavily vegetated south side of the dam provides another route for vehicles.

Purpose

The purpose of the Utopia Dam was originally to support a grist mill. However, after Hurricane Hazel in 1954 washed out the original structure, the NVCA rebuilt the existing earth and concrete gravity dam in 1967-68. Today, the primary functions of the Utopia Dam are to enhance the natural features within the Utopia Conservation Area and provide flood management benefits.

Bank Slope Characteristics

The Utopia Dam is a 9.1-metre-high earth dyke featuring a concrete control structure and a stilling basin equipped with baffle blocks. The control structure includes two stop log sluiceways, each containing nine stop logs to effectively manage water flow. Additionally, the crest of the embankment is estimated to be at an elevation of 201.65 metres and a portion of the earth embankment located to the north of the concrete structure serves as an emergency spillway.

Dam Capacity and Design Criteria

The Utopia Dam is designed to effectively manage water flow and storage, with a stage-discharge-storage relationship that allows for significant capacity. Historically, the summer operating procedure required for nine logs to be placed in each bay so the dam can discharge up to the 1000-year rainfall event at an elevation of 201.55 m (661.25 ft) without overtopping the control structure at 201.83 m (662.17 ft). Conversely, the historic winter operating procedure required for six logs to be placed in each bay so the dam can similarly handle a 1000-year rainfall event at an elevation of 201.46 m (660.96 ft) without risk of overtopping.

More recently, seasonal stop log manipulation at Utopia Dam has ceased and six logs remain in place in each bay year-round. NVCA staff are in the process of developing a sediment management plan for Utopia Dam which could influence future stop log placement and manipulation requirements. Table 5 is a summary of key design features.

Table 5. Utopia Dam design features and measurements.

Design Feature	Measurement
Low Flow Gate Structure	
Dimensions	0.61 m x 0.61 m (2ft x 2ft)
Emergency Spillway	

Crest	200.45 m (657.64 ft)
Length	25.00 m (82.02ft)
Stop Logs	
Each Log	0.254 m x 0.305 m x 4.267 m (0.83 ft x 1 ft x 13.99 ft)

Operational Procedures and Recommendations

Historically, the Utopia Dam operated seasonally, with adjustments made twice a year to manage water levels effectively. During the winter drawdown, three stop logs were removed one at a time over the course of one or two weeks, leaving six logs in each bay to achieve the winter regulated water level of 199.03 m (653.00 ft). In the spring, following the freshet, the stop logs were replaced to maintain the summer regulated water level of 199.95 m (656.00 ft), with a total of nine logs per bay in place. More recently, seasonal stop log manipulation at Utopia Dam has ceased and six logs remain in place in each bay year-round.

As a result of a third-party Dam Safety Review for Utopia Dam (2008), a list of recommendations to improve the safety and operations of the dam have been provided. The priorities have been classified by NVCA staff as "Immediate", "High", "Medium" and "Low" to maintain consistency with other Dam Safety Review prioritizations of recommendations. The priorities are defined as follows:

- *Immediate* – Remedial action that needs to be carried out as soon as possible because the deficiency is an immediate high-risk dam safety hazard with a high likelihood of occurrence of loss of life and /or serious environment and/or serious economic consequences.
- *High* – Remedial action is required within the next 2 years to meet current regulations and/or dam safety requirements and is a high-risk dam safety hazard.
- *Medium* – These items may include additional work that could improve the performance or issues that may become serious dam deficiencies. These items typically should be addressed within five (5) years.
- *Low* – These are opportunities to improve safety or only in the long term may become a serious dam safety deficiency. The recommended remedial action is expected to be required only at least 6 years from now.
- *Ongoing* – These items may need to be reviewed and completed on a regular basis to ensure that the function of the structure and public safety measures is maintained.

The recommendations are prioritized based on the risk of occurrence, significance of potential negative impacts, and resources (cost, time, effort) required for their implementation. **Table 6** provides a summary of these recommendations with their designated priority level.

Table 6. Operational Recommendations for Utopia Dam based on the 2008 Dam Safety Review by Trow Associates.

Category	Recommendation	Priority
Measures to Meet Ontario Dam Safety Guidelines	Refinement of potential for embankment failure during a rapid reservoir drawdown by obtaining more detailed information on dam stratigraphy and soil parameters. This can be achieved through a geotechnical investigation program; four boreholes drilled at 15-metres deep, laboratory testing and reporting. The program would establish the actual soil parameters and re-evaluate the stability analysis of the 2008 DSR.	High
Deficiencies - Operations	Dam records lack record or as-constructed drawings. A survey should be undertaken of the dam and associated works, including a topographic survey of the reservoir and downstream areas. A permanent elevation marker (referencing GSC elevation) should be established on the deck of the dam.	Medium
Deficiencies - Operations	Emergency spillway erosion protection should be enhanced through large riprap placed along the fringes of the access road. Larger diameter gravel or stone placed along the access road is also recommended.	Medium
Deficiencies - Operations	A staff gauge should be located on the reservoir in order to estimate water levels on the reservoir during storm events. The gauge should be established to a GSC metric datum. Consideration should be given to installing an automatic water level recorder (pressure transducer type) in the reservoir that can be accessed remotely by NVCA staff.	Medium
Deficiencies - Operations	Dam operations should be reviewed to assess the necessity of the low flow valve. If the valve is not necessary, it should be sealed shut from inside the manhole (both upstream and downstream pipes) and the operator removed.	Medium
Deficiencies - Operations	It should be confirmed that the gate valve for the grist mill's turbine was sealed. Inspection records indicate that this did occur in 2000. Both ends of the turbine flume pipe should be sealed. If the valve has been sealed, the operator should be removed. If it has not been decommissioned, it is recommended that this be undertaken.	Medium
Deficiencies - Materials	Areas of minor cracking, abrasion and efflorescence should be monitored for enlargement or exposed reinforcement. If it appears that restoration of the concrete is necessary, restoration will consist of: o Scaling of surfaces; o Refurbishing surfaces with a high strength, non-shrink grout.	High

Deficiencies - Materials	The cracks within both stop log bays that are showing evidence of past seepage should be cleaned to remove all evidence of seepage, and then monitored to determine if the seepage is on-going. If seepage is still occurring, the cracks should be repaired by injecting high strength, non-shrink grout into the cracks.	High
Deficiencies - Materials	The cracks at the corners of the fish ladder and the north wingwall beneath the handrail should be repaired immediately with high strength, non-shrink grout to ensure that the cracks do not progress and result in loss of the concrete.	High
Deficiencies - Materials	The areas of popouts and spalls should be repaired by scaling of the affected surfaces, followed by the application of mortar.	High
Deficiencies - Materials	The expansion joint on the north wingwall that is missing waterstop (mastic) should be repaired. Two steel plates would be bolted into the concrete, one on either side of the joint, and butted up against each other (a small gap is left for expansion and contraction, see Appendix H of 2008 DSR). By comparing the displacement of the plates, the displacement of the wingwall can be measured.	High
Deficiencies - Materials	The hole / depression in the deck near the fish ladder outlet should be cleaned out and filled with a dry pack cement mix.	High
Deficiencies - Materials	The present areas of rusting on the pier nosing and gain linings should be monitored for signs of distress and failure, and replaced if necessary.	Medium
Deficiencies - Materials	The damaged gain cover for Bay 1 should be monitored and replaced when the damage impacts operations or poses a hazard to operators.	Medium
Deficiencies - Materials	Replacement of the fish ladder decking would be advisable. If a metal grid was used, it would make inspection of the outlet easier.	High
Deficiencies - Maintenance	Vegetation growth should be cleared or trimmed regularly. The grasses on the access road from Old Mill Road should be cut short and the overhanging trees trimmed back. Any vegetation growth on the service deck and fencing should be removed.	Low
Deficiencies - Maintenance	Sediment build-up in the reservoir behind the dam is a significant issue. During stop log manipulation, sediment will be released downstream. In the short-term, NVCA should be undertaking annual field surveys similar to one done in 1985 by Seneca College and the results compared to previous surveys to monitor sediment accumulation in the reservoir. If the accumulation is becoming significant, consideration should be given to dredging the reservoir.	Low
Deficiencies - Maintenance	In the long-term, NVCA should undertake a study of the entire watershed to identify the sources of sediment within	Low

	the reservoir and develop measures to lessen the amount entering Bear Creek and eventually reaching Utopia Reservoir.	
Deficiencies - Safety	The handrails are currently acting as a physical barrier from falls. However, if the handrails are to be used as the fixed support in a fall arrest system, the anchoring system needs to be adjusted to ensure that they address the requirements of the Occupational Health and Safety Act. It is recommended that the handrails be secured to the concrete decking and wingwalls through base plates and anchors.	High
Deficiencies - Safety	The wooden staircase running along the north wingwall should be evaluated to determine if it is still required. As the site is generally not used by the public, the staircase should be removed. However, it is still required, the vegetation growing between the treads should be removed and consideration be given to adjusting the spacing between risers to make travel easier.	High
Review Hazard Potential Classification	NVCA review the Hazard Potential Classification of Utopia Dam in ten years (2017).	Low

4. Black Ash Creek Floodway

Location

The Black Ash Creek Floodway is a 2-kilometres long channel running through the Town of Collingwood. The channel was re-constructed into a formal floodway as part of flood control works constructed over multiple years (from 2003 to 2007). The meandering channel design with pool/riffle sequences now provides for the confined conveyance of regulatory storm flows within the Black Ash Creek corridor, as well as an extended coldwater stream habitat through the reaches south of Mountain Road. The Floodway's low flow channel is approximately 3-metres wide, and some erosion control is provided through the meandering design of the Floodway.

Figure 7. Black Ash Creek Floodway.

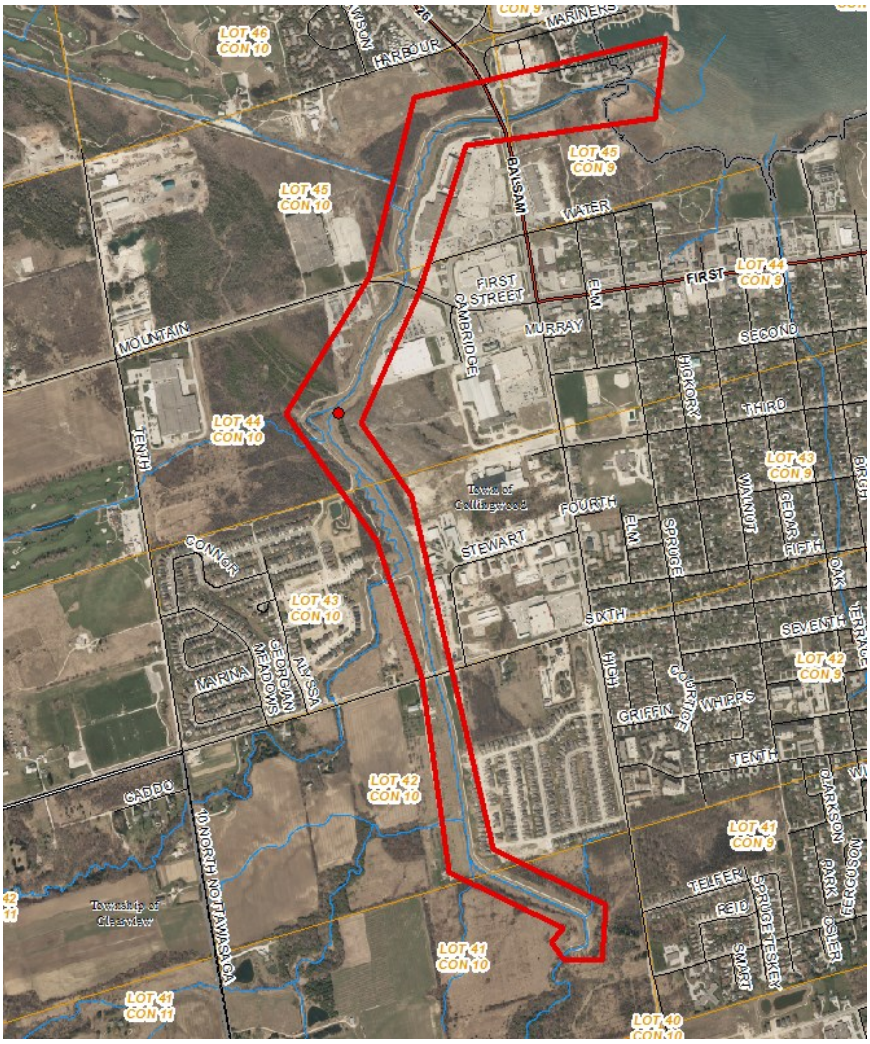

Figure 8. Location of Black Ash Creek Floodway channel in the Town of Collingwood, extending 2 kilometres from south of Sixth Street to its outlet at Georgian Bay.

Access

The Black Ash Creek Floodway can be accessed at street-level from several bridge crossings, including the Sixth Street, Mountain Street, and Highway 26 bridge crossings. In addition, the Town of Collingwood trail system south of Mountain Street provides for easy access to the Floodway reaches south of the roadway.

Purpose

The Black Ash Creek channelization project, undertaken by the Nottawasaga Valley Conservation Authority (NVCA) in partnership with the Town of Collingwood, was designed with the primary objective of enhancing flood protection within the Town of Collingwood.

Bank Slope Characteristics

The Black Ash Creek Floodway was designed with 2.5:1 side slopes as a trapezoidal channel for its downstream reaches near Georgian Bay. The Floodway then

transitions to a rectangular channel upstream of Highway 26 due to capacity concerns and, further upstream, to 3:1 side slopes south of Sixth Street due to soil conditions.

Floodway Capacity and Design Criteria

The Black Ash Creek Floodway provides for the confined conveyance of regulatory storm flows within the constructed 2-kilometre channel footprint. The Black Ash Creek channelization project included the following general works:

- The creation of a dyke upstream of Mountain Road bridge with a rectangular channel constructed in this area (next to Walmart) due to capacity issues at the Highway 26 bridge.
- Culvert replacement at Sixth Street to improve channel capacity.
- Minimizing use of riprap to improve the naturalization of the channel, with bioengineering and vegetation plantings used for erosion protection where possible.
- Trapezoidal channel with 2.5:1 side slopes in the downstream reaches, transitioning to a rectangular channel upstream of Highway 26 due to capacity concerns and, further upstream, to 3:1 side slopes south of Sixth Street due to soil conditions.

Operational Procedures and Recommendations

At this point in time, no third-party inspections have been conducted for the Black Ash Creek Floodway given its relatively recent construction. From 2024-2025, the first formal third-party Floodway Safety Review will be initiated. In the interim, NVCA engineering staff have conducted annual inspections of the 2-kilometre channel and stewardship staff continue to undertake vegetation planting projects along the Floodway embankments, improving slope stability and providing shading along the extended coldwater habitat sections.

NVCA staff have internally developed recommendations for the Black Ash Floodway based on observations from recent inspections and funding allocations in the Asset Management Plan. These recommendations are presented in **Table 7**.

Table 7. Recommendations for the Black Ash Creek Floodway.

Category	**Recommendation**
Complete Formal Floodway Safety Review	Complete a Floodway Safety Review tailored to the risk of failure of the structure.
Complete Topographic Survey	Complete Topographic Survey and Comparison to Issued-for-Tender Drawings, Plans, and Profiles.
Beaver Dam Removal and Development of SOP to Guide Future Inspections & Removals	Remove existing beaver dams (must be done outside of fisheries windows due to in-water nature of the works). Also, remove any vegetation within the Floodway (i.e., any vegetation creating obstructions to the Floodway proper).

5. Pretty River Dike

Location

The Pretty River Dike is situated in the Town of Collingwood, County of Simcoe, Ontario, approximately 55 kilometres northwest of Barrie. This essential dike system consists of a series of dikes that line the east and west banks of the Pretty River, extending from its outlet at Georgian Bay to a point about 2.2 kilometres upstream.

Figure 9. Pretty River Dike system lining the east and west banks of the Pretty River.

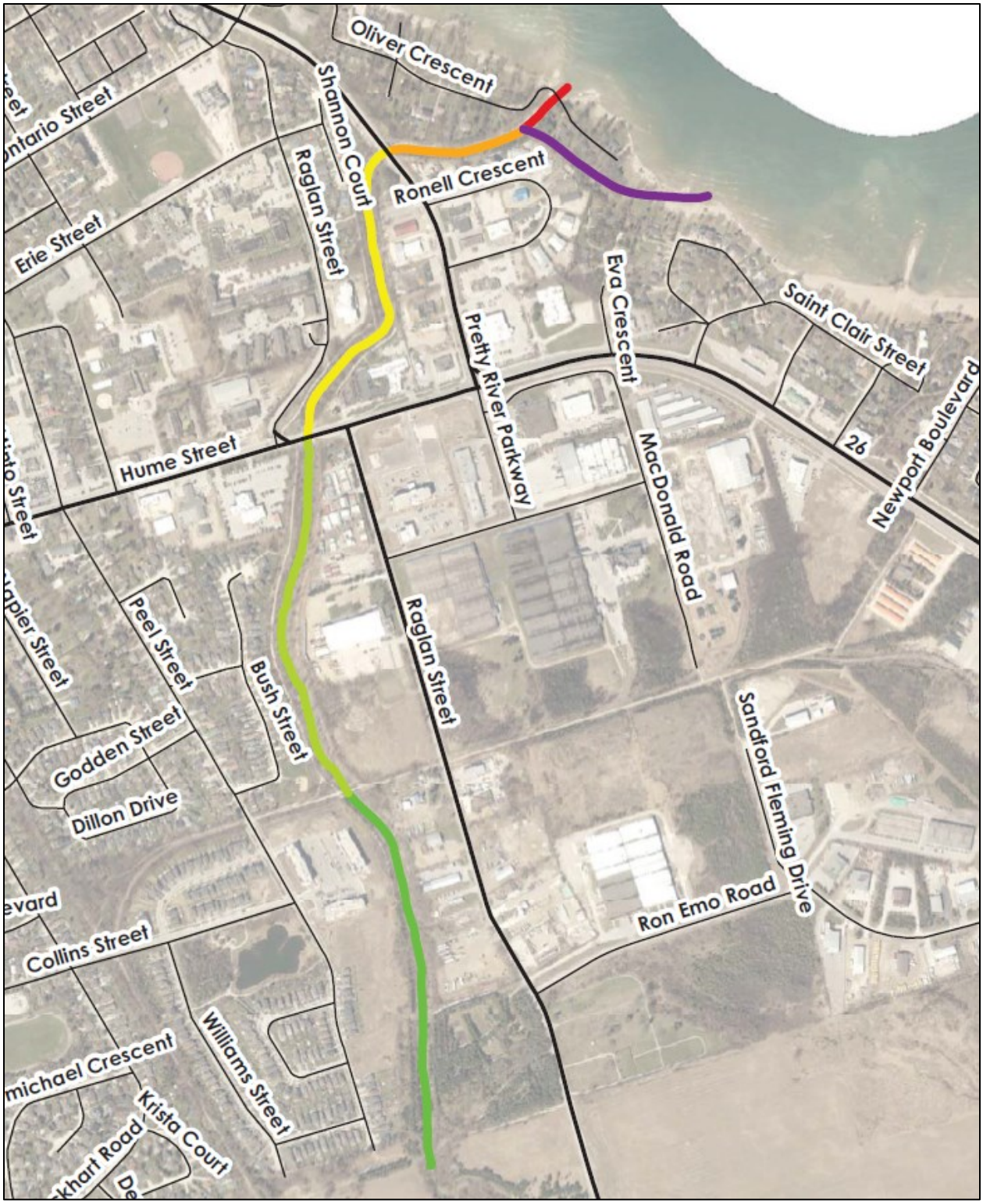

Figure 10. Location of Pretty River Dike in the Town of Collingwood, extending 2.2 kilometres through the town to its outlet at Georgian Bay. Each of the colours denotes a different section and reach of the dike structure (credit: D.M. Wills, 2024).

Access

The Pretty River Dike system intersects several roads and bridge crossings, including Oliver Crescent, Pretty River Parkway, and Hume Street. It also features a former Canadian National Railway (CNR) bridge, now serving as a pedestrian crossing, as well as a private driveway bridge. Access to the dike is generally available through publicly owned lands, with various entry points along its length.

- An informal trail allows access from Oliver Crescent along the crest of the dike on both the east and west sides of the river.
- Parking is available at the north end of Shannon Court, from where visitors can walk to the dike's beginning at Pretty River Parkway. Here, a formal public trail, maintain by the Town of Collingwood, runs along the west side of the river, while an informal trail exists on the east.
- Parking at the north end of River Run and walking to the dike start at Hume Street. A formal public trail is available on the west side, extending from Hume Street to the CNR Trail bridge.

Purpose

The Pretty River Dike system was originally constructed in the 1970s to mitigate the risk of flooding in the urban areas of Collingwood. The dike system protects a significant portion of the town from the Regulatory Flood Event (Timmins).

Bank Slope Characteristics

The Pretty River Dike system features approximately 2.2 kilometres of earthen dikes on both the east and west sides of the river, providing essential flood protection to the Town of Collingwood. In addition to these dikes, the system includes five flap gates or check valves strategically located at various storm sewer outlets to manage water flow effectively. At the downstream end, an ice control structure along Oliver Crescent helps prevent ice buildup, while a bypass weir and bypass culverts further enhance drainage capabilities.

Dike Capacity and Design Criteria

The Pretty River Dike was originally constructed to convey a significant portion of the Regulatory Flood Event (Timmins) while minimizing the magnitude and extent of any spills leaving the leveed portions of the system.

Operational Procedures and Recommendations

There are no operations required for the Pretty River Dike system, other than regular vegetation management and control. All structures will function during a flood without the need for any intervention by NVCA staff. Routine inspections and maintenance are completed on an annual basis by NVCA engineering staff, and these inspections are critical to ensuring the dike system continues to function as designed. Routine inspections may include the checking and maintenance of the flap gates and check valves, removal of debris from the watercourse, and clearing of vegetation from the embankment slopes.

As a result of a phased third-party Dike Safety Review for the Pretty River Dike (Phase 1, 2024), a list of recommendations to improve the safety of the dike have been provided. The priorities are classified as "Immediate", "High", "Medium" and "Low" and are defined as follows:

- *Immediate* – Remedial action that needs to be carried out as soon as possible because the deficiency is an immediate high-risk dam safety hazard with a high likelihood of occurrence of loss of life and /or serious environment and/or serious economic consequences.
- *High* – Remedial action is required within the next 2 years to meet current regulations and/or dam safety requirements and is a high-risk dam safety hazard.
- *Medium* – These items may include additional work that could improve the performance or issues that may become serious dam deficiencies. These items typically should be addressed within five (5) years.
- *Low* – These are opportunities to improve safety or only in the long term may become a serious dam safety deficiency. The recommended remedial action is expected to be required only at least 6 years from now.
- *Ongoing* – These items may need to be reviewed and completed on a regular basis to ensure that the function of the structure and public safety measures is maintained.

The recommendations are prioritized based on the risk of occurrence, significance of potential negative impacts, and resources (cost, time, effort) required for their implementation. **Table 8** provides a summary of these recommendations with their designated priority level.

Table 8. Prioritized recommendations for the Pretty River Dike based on the 2024 Phase 1 Safety Review by D.M. Wills.

Category	**Recommendation**	**Priority**
Management System	Establish a regular frequency for engineering inspections (i.e., five years) as well as routine inspections by staff (i.e., annually).	Ongoing
Management System	Upon completion of the ongoing tree and vegetation management program, establish a regular frequency for clearing woody vegetation from the various sections of the dike (i.e., annually).	Ongoing
Management System	Complete Phase 2 of the Dike Safety Review.	Medium
Management System	Monitor the bypass culverts for further deformation (squatting) and piping through the gaps between the culverts and concrete structure on the upstream side.	Ongoing
Management System	Monitor the bank erosion at Station 0+110 (Section 3) on the left side of the east dike and implement remedial measures, if required. The slope and rock protection in this area should be restored as part of the tree removals, when they are completed.	Ongoing

Management System	Monitor the bank erosion between Stations 1+425 and 1+440 (Section 5) on the right side of the west dike and implement remedial measures, if required. The slope in this area should be restored as part of the tree removals, when they are completed, and the existing rock protection should be extended downstream.	Ongoing
Management System	The NVCA should review/discuss the proposed replacement of the private road bridge at Station 2+215 with the Town of Collingwood. The design for the new pedestrian bridge should consider the stability and integrity of the dike and should address the steep/eroded slopes downstream of the existing bridge. If the existing bridge is to remain open to the public until it is replaced, measures to protect public safety are strongly recommended.	Immediate
Management System	Confirm the location and the extent of the property and easements owned by the NVCA or Town of Collingwood. Develop communication tools to inform property owners about the presence of the easement on their property as well as acceptable uses of their lands within the easement. Where required, develop additional communication tools to inform property owners that they are encroaching on land owned by the NVCA or the Town of Collingwood.	Medium
Public Safety	Install Ontario Building Code compliant railings on the retaining walls on all four quadrants of the CNR Trail bridge.	High
Minor Maintenance	Clear all trees and woody vegetation from the dike above the bypass culverts, restore the embankment slopes, and establish stable vegetative ground cover or rock protection.	Medium
Minor Maintenance	Remove the rocks and woody debris from the interior of the bypass culverts and the woody debris from the upstream ends of the bypass culverts.	High
Minor Maintenance	Repair the deteriorated gabion basket slope protection upstream and downstream of the CNR Trail bridge.	Medium
Minor Maintenance	Consider removing the bridge abutments at Station 1+975. The dike slopes would need to be regraded, and rock protection would need to be installed. If the bridge abutments will not be removed, or if their removal will take time, consider installing Ontario Building Code compliant railings to prevent falls from the tops of the bridge abutments.	Low
Minor Maintenance	Restore the rock protection above the flap gate headwall at Station 0+330 in Section 3 on the east side of the river.	Medium
Minor Maintenance	Clear all vegetation, rocks, and other debris from in and around the flap gate / check valve headwalls at Station 0+330 in Section 3, Station 0+360 in Section 4, Station 0+920 in Section 5, and Station 1+880 in Section 6.	Medium
Major Maintenance	The NVCA should review the condition of the Oliver Crescent crossing structure with the Town of Collingwood and should prepare a plan for its eventual rehabilitation or replacement.	Low

Major Maintenance	The NVCA should continue the ongoing tree removal program for the dike system. This should include removal of all trees and woody vegetation, restoration of the embankment slopes, and restoration stable vegetative ground cover or rock protection. All woody debris should be cleaned up and removed from the site. Ongoing removal of trees and other woody vegetation will need to be undertaken by NVCA staff once the tree removal program is completed.	High

6. Tiffin Pond Dams

Location

The Tiffin Pond Dams are located within the Tiffin Centre for Conservation (8195 8th Line, Utopia, Essa Township, County of Simcoe, Ontario). More commonly known as the Momma Bear Dam (Tiffin Pond Dam #1) and the Poppa Bear Dam (Tiffin Pond Dam #2), these dams provide for the passive management of water levels at the outlets of Momma Bear Pond and Poppa Bear Pond.

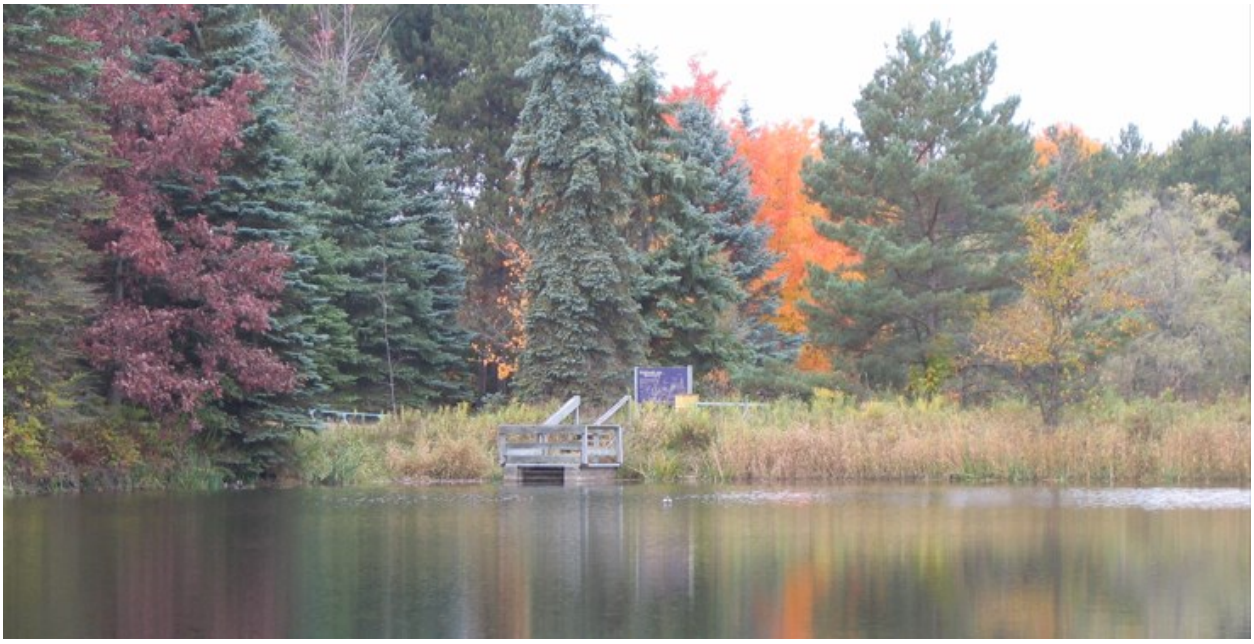

Figure 11. Momma Bear Dam (a.k.a. Tiffin Pond Dam #1).

Figure 12. Poppa Bear Dam (a.k.a. Tiffin Pond Dam #2).

Figure 13. Location of Tiffin Pond Dams in Essa Township.

Access

Both dams can be easily accessed from the trail system of the Tiffin Conservation Area in Utopia, Essa Township.

Purpose

Although the original objectives of Momma Bear Dam and Poppa Bear Dam are unknown, it is assumed that both dams were used to manage water levels within the Tiffin Conservation Area prior to NVCA's ownership of these lands. Currently, both dams provide for water level management of the upstream ponds prior to discharging westward, beneath 8th Line and toward Bear Creek. It is assumed that both structures provide for flood control and, to a certain extent, erosion control for the receiving watercourse of Bear Creek.

Dam Capacity and Design Criteria

At this point in time, the capacity and design criteria which informed the installation of the Tiffin Pond Dams are unknown. In 2024-2025, NVCA engineering staff will be conducting the first formal third-party Dam Safety Review for both dams. It is anticipated that the safety review will daylight additional information about the capacity and design components of both dams.

Operational Procedures and Recommendation

At this point in time, no third-party inspections have been conducted for the Tiffin Pond Dams. In 2024-2025, the first formal third-party Dam Safety Review will be initiated for both structures.

NVCA staff have internally developed recommendations for both structures based on funding allocations in the Asset Management Plan. These recommendations are presented in Table 9.

The recommendations are prioritized based on the risk of occurrence, significance of potential negative impacts and resources (cost, time, effort) required to implement. **Table 9** provides a summary of these recommendations with their priority level.

Table 9. Recommendations for Tiffin Pond Dams

Category	**Recommendation**
Complete Dam Safety Review	Dam safety review for Poppa Bear Dam (tailored to the risk of failure of the structure).
Complete Dam Safety Review	Dam safety review for Momma Bear Dam (tailored to the risk of failure of the structure).

Routine and Ongoing Maintenance of Infrastructure

Inspection Protocol and Equipment

Inspection of the dams must be undertaken in a safe and professional manner that necessitates the use of equipment. The equipment is to be kept in good working condition. The equipment should be checked each time after being used, properly stored and repaired or replaced as required.

The following equipment should be available at the dam site (either permanently kept at the site or transported in an NVCA vehicle with staff):

- Bottom draw "wrench" (five-foot bar with a handle and hex head)
- Personal flotation device
- Safety harnesses and extra rope
- Flashlights
- Cellular phone
- Small toolkit, grease gun, pipe wrench, and bolt cutters
- Camera

Frequency of Inspections

Inspections of NVCA's natural hazard infrastructure are conducted with a systematic approach to ensure their integrity and safety. Monthly inspections are carried out to promptly identify any issues that may arise. In addition to these monthly checks, an annual inspection must also be performed, with detailed records maintained to document both the inspection findings and any maintenance conducted during the year. Furthermore, third-party inspections are scheduled at regular intervals dictated by the assessed consequence of failure of each structure. The third-party inspections provide an independent assessment of each structure's condition and compliance with safety standards.

Documentation

Monthly and annual inspection forms are required to be filled out during each inspection conducted by NVCA staff. To review the forms, please refer to **Appendix A.**

Emergency Preparedness

Emergency Preparedness Plans for NVCA's natural hazard infrastructure are categorized into active and passive strategies based on the level of service and operations involved. Active emergency preparedness plans involve detailed, operational protocols that can be swiftly executed during an emergency, ensuring rapid response and mitigation of risks. Currently, three dams within the NVCA have such active plans in place (New Lowell Dam, Tottenham Dam, and Utopia Dam), enabling prompt action in the event of a crisis. Conversely, the remaining infrastructure is supported by a high-level action plan which outlines general response procedures and notification guidelines for emergencies.

Active Emergency Preparedness Plans

The Tottenham Dam, New Lowell Dam, and Utopia Dam are equipped with active Emergency Preparedness Plans designed to ensure prompt and effective responses to emergencies. The Emergency Actions Tables shown below provide detailed action plans for each structure, summarizing procedures and responsibilities during various emergency scenarios. In the event of emergencies, these action plans will guide NVCA's response to minimize risks and protect the community. For further information on each Emergency Preparedness Plan, including roles, communication protocols, and mitigation measures, please refer to **Appendices B, C and D**.

Tottenham Dam – Emergency Actions Table

Problem	How to Evaluate	Notification	Data to Record	Action
Flooding	• Water level exceeds 252.60 m	Flood Warning Coordinator **NVCA**	• Water flow discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Follow Operation, Maintenance and Surveillance (OMS) Manual procedures to open all outlets until water level begins to recede. If water level continues to rise after all outlets are open, follow procedure for imminent dam failure.
	• Water level exceeds top of dam at elevation 253.60 m	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels. • In consultation with Flood Warning Coordinator, create additional spill capacity by controlled breach of dam. Follow procedures for Imminent Dam Failure.
Imminent Dam Failure	• Excessive Seepage • Whirlpool in Headpond • Extensive Cracking	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs	• Restrict Access • Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels.

	• Boils or Springs Downstream • Discharge of Fines • Movement of Dam		• Dam condition	• Plug boils or springs with any available materials. • Stabilize dam by placing soil in toe area.
Dam Failure	• Dam Breached	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Description and location of dam breach	• Restrict Access
Non-dam Emergency	• Swimming Emergency • Personal Injury	Emergency Medical Response Team **911** Director of Watershed Management Services **NVCA**	• Nature of Problem • Photographs • Names • Cause(s) of accident • Length of time for response	• Follow standard procedures for First Aid

New Lowell Dam – Emergency Actions Table

Problem	How to Evaluate	Notification	Data to Record	Action
Flooding	• Water level exceeds 201.96 m	Flood Warning Coordinator **NVCA**	• Water flow discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Follow Operation, Maintenance and Surveillance (OMS) Manual procedures to open all outlets until water level begins to recede. If water level continues to rise after all outlets are open, follow procedure for imminent dam failure.
	• Water level exceeds top of dam at elevation 203.25m	Flood Warning Coordinator **NVCA**	• Water discharge, headwater, tailwater	• Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels.

		Warn anyone in immediate area	elevations and rate of change • Weather conditions • Photographs • Dam condition	• In consultation with Flood Warning Coordinator, create additional spill capacity by controlled breach of dam. Follow procedures for Imminent Dam Failure.
Imminent Dam Failure	• Excessive Seepage • Whirlpool in Headpond • Extensive Cracking • Boils or Springs Downstream • Discharge of Fines • Movement of Dam	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Restrict Access • Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels. • Plug boils or springs with any available materials. • Stabilize dam by placing soil in toe area.
Dam Failure	• Dam Breached	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Description and location of dam breach	• Restrict Access
Non-dam Emergency	• Swimming Emergency • Personal Injury	Emergency Medical Response Team **911** Director of Watershed Management Services **NVCA**	• Nature of Problem • Photographs • Names • Cause(s) of accident • Length of time for response	• Follow standard procedures for First Aid

Utopia Dam – Emergency Actions Table

Problem	How to Evaluate	Notification	Data to Record	Action
Flooding	• Water level exceeds 201.38 m	Flood Warning Coordinator **NVCA**	• Water flow discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Follow Operation, Maintenance and Surveillance (OMS) Manual procedures to open all outlets until water level begins to recede. If water level continues to rise after all outlets are open, follow procedure for imminent dam failure.
	• Water level exceeds top of dam at elevation 201.75m	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels. • In consultation with Flood Warning Coordinator, create additional spill capacity by controlled breach of dam. Follow procedures for Imminent Dam Failure.
Imminent Dam Failure	• Excessive Seepage • Whirlpool in Headpond • Extensive Cracking • Boils or Springs Downstream • Discharge of Fines • Movement of Dam	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Restrict Access • Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels. • Plug boils or springs with any available materials. • Stabilize dam by placing soil in toe area.
Dam Failure	• Dam Breached	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions	• Restrict Access

			• Photographs • Description and location of dam breach	
Non-dam Emergency	• Swimming Emergency • Personal Injury	Emergency Medical Response Team **911** Director of Watershed Management Services **NVCA**	• Nature of Problem • Photographs • Names • Cause(s) of accident • Length of time for response	• Follow standard procedures for First Aid

Passive Emergency Preparedness

Black Ash Creek Floodway, Pretty River Dike, Tiffin Pond Dam #1, and Tiffin Pond Dam #2 do not have active Emergency Preparedness Plans. To inform response during potential emergencies, there are well-defined roles and responsibilities that identify the components of an effective emergency response. These roles and responsibilities are listed below.

NVCA Roles & Responsibilities:

- Ensure that communication equipment and emergency supplies are well maintained and readily available.
- Maintain access to the site.
- Safely operate the dam when necessary.
- Identify emergency conditions and take appropriate action.
- Notify the Flood Warning Coordinator of any occurring or past emergencies.
- Take actions to mitigate damages from emergency conditions.
- Immediately notify anyone downstream who may be in danger.
- Conduct routine inspections of the dam for potential issues (e.g., dam body, concrete conditions, spillway, foundations, seepage, signs of failure).
- Report any observed dam deficiencies to the Director of Watershed Management Services.

Municipal Roles & Responsibilities:

- Have primary responsibility for flood emergency response and resident safety.

- Notify appropriate municipal officials and agencies per their emergency plan upon receiving a Flood Advisory or Flood Warning.
- Determine the appropriate response and deploy municipal resources as needed.
- Declare a flood emergency and implement the Emergency Procedures Plan if warranted.
- Request provincial assistance if municipal resources are inadequate.
- Communicate with Conservation Authority Flood Coordinators.

Infrastructure Operations Plan Review and Update

NVCA staff will conduct an annual review of the Natural Hazard Infrastructure Operational Plan to ensure that all information contained within the document remains current and accurate. This review process will include updates as necessary throughout the year to address any emerging issues or changes in operational practices.

In the event of significant modifications to the plan, these changes will be presented to the Board of Directors for approval prior to implementation. This structured approach ensures that the plan reflects the most up-to-date information and best practices that support the effective management of natural hazard infrastructure operations.

Appendix A – NVCA Inspection Forms

NVCA MONTHLY DAM INSPECTIONS **Staff:** **Date:**

DAM: NEW LOWELL WEATHER:

Earth Embankment Seepage			
Concrete Structure			
Catwalks, Railings Decks, Gates			
Water level, other measurements			
Winches & housings			
Locks, hazard signage, access route			
Vegetation, debris			
Reservoir rim			
Spillway			
Theft, damage or vandalism			
Water quality (visual only)			
Number of logs in place			
Piezometer level measured	Y	N	Level

NVCA MONTHLY DAM INSPECTIONS **Staff:** **Date:**

DAM: **UTOPIA** WEATHER:

Earth Embankment Seepage	
Concrete Structure	
Catwalks, Railings Decks, Gates	
Water level, other measurements	
Winches & housings	
Locks, hazard signage, access route	
Vegetation, debris	
Reservoir rim	
Spillway	
Theft, damage or vandalism	
Water quality (visual only)	
Number of logs in place	

NVCA MONTHLY DAM INSPECTIONS **Staff:** **Date:**

DAM: TOTTENHAM WEATHER:

Earth Embankment Seepage	
Concrete Structure	
Catwalks, Railings Decks, Gates	
Water level, other measurements	
Winches & housings	
Locks, hazard signage, access route	
Vegetation, debris	
Reservoir rim	
Spillway	
Theft, damage or vandalism	
Water quality (visual only)	
Notes	

NVCA DAM INSPECTIONS (Annual) Structure: Date:

*Note – all items are to be located left to right looking upstream

ITEM	GOOD	FAIR	POOR	REMARKS
INSPECTION BY				
WEATHER				
EARTH EMBANKMENT				
CONCRETE STRUCTURE, WINGWALLS, PIERS, DECK				
WOODEN STRUCTURES, DECKS, CATWALKS, RAILINGS				

NVCA DAM INSPECTIONS (Annual) Structure: Date:

*Note – all items are to be located left to right looking upstream

ITEM	GOOD	FAIR	POOR	REMARKS
STOP LOGS				
WATER LEVEL GAUGE OR OTHER INSTRUMENTATION				
WINCHES AND HOUSING CABLES				
VALVES				

NVCA DAM INSPECTIONS (Annual) Structure: Date:

*Note – all items are to be located left to right looking upstream

ITEM	GOOD	FAIR	POOR	REMARKS
EROSION AND EROSION PROTECTION WORKS CONDITION OF RESERVOIR RIM BURROWING ANIMALS				
SEEPAGE OR LEAKS				
HAZARD SIGNAGE				
ACCESS ROUTE KEYS				

NVCA DAM INSPECTIONS (Annual) Structure: Date:

*Note – all items are to be located left to right looking upstream

ITEM	GOOD	FAIR	POOR	REMARKS
OTHER HAZARDS				
VEGETATION OBSTRUCTIONS DEBRIS				
SPILLWAY				
SUBSURFACE DRAINAGE				

NVCA DAM INSPECTIONS (Annual) Structure: Date:

*Note – all items are to be located left to right looking upstream

ITEM	GOOD	FAIR	POOR	REMARKS
OPERATIONAL TEST OF EQUIPMENT				
SEDIMENTATION AND SILTING				
MEASUREMENTS				

NVCA DAM INSPECTIONS (Annual) Structure: Date:

*Note – all items are to be located left to right looking upstream

ITEM	GOOD	FAIR	POOR	REMARKS
OTHER NOTES AND OBSERVATIONS				

NVCA DAM INSPECTIONS (Annual) Structure: Date:

*Note – all items are to be located left to right looking upstream

ITEM	GOOD	FAIR	POOR	REMARKS

SUMMARY OF ACTION ITEMS	
1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.

NVCA DAM INSPECTIONS (Annual) Structure: Date:

*Note – all items are to be located left to right looking upstream

ITEM	GOOD	FAIR	POOR	REMARKS
10.				20.
21.				26.
22.				27.
23.				28.
24.				29.
25.				30.

SKETCHES

Appendix B – Emergency Preparedness Plan for New Lowell Dam

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FIGURES

APPENDICES

1 Introduction

New Lowell Dam is located at the outlet of New Lowell reservoir, within the Coates Creek subbasin, and is situated on Lot 10, Concession IV in Sunnidale Township, County of Simcoe. Coates Creek is a tributary of the Mad River which in turn is a major tributary to the Nottawasaga River and Nottawasaga Bay.

The Hazard Potential Classification of the New Lowell Dam is considered HIGH and the inflow design flood (IDF) is preliminarily appointed to the probable maximum flood (PMF).

As part of an overall dam safety program that is being implemented by the Nottawasaga Valley Conservation Authority (NVCA) and Ministry of Natural Resources (MNR), an Emergency Preparedness Plan (EPP) was prepared for New Lowell Dam on the basis of the results of the various analyses performed and the requirements of the draft ODSG. From time to time, this plan may be updated. Details of the various revisions to the plan and the holders of this document are contained in the inside cover of the document. This document is site specific for New Lowell Dam and makes reference to the NVCA's Flood Contingency Plan (FCP), which is the master emergency response document of the Conservation Authority.

1.1 Purpose

According to the requirements of the draft ODSG:

"*An EPP shall describe the actions to be taken by the dam owner and operator in an emergency. The EPP shall assign responsibility for each action to be taken by an individual (identified by organizational position) and/or a backup.*"

For the normal day to day operation of the dam, the dam operator would refer to the Operation, Maintenance and Surveillance Manual.

A comprehensive EPP is necessary to ensure that all parties responsible for water control along the watershed are involved in an action plan to ensure the safety of the public in the event of a dam emergency.

The purpose of the EPP report is to describe the procedures that should be followed and the actions that should be taken when an emergency situation is identified at the New Lowell dam site.

Specifically, this plan is intended to allow the dam operator (or other designated staff) to clearly identify what constitutes an emergency situation (Section 3) and details:

- NVCA staff responsibilities for notification in the event of an emergency (Section 4).

- Any additional responsibilities of staff for warning or evacuating people within the immediate vicinity of the dam (Section 5).

- Locations of equipment suppliers and materials available to staff to assist in mitigating the effects of an emergency (Section 5.6)

- Drawings showing the characteristics of the dam (Appendix).

Characteristics of the dam and surrounding area, details of access to the site and details of the potential for flooding in the event of a dam failure are described in this section.

1.2 Authority

Under the Emergency Management Act, each Ministry must develop a Provincial Emergency Response Plan (ERP) for their assigned area of special responsibility. MNR has been designated as the lead for flood, fire, drought, dam failures, oil and gas, and landslides/subsidence/unstable slopes.

Each MNR district office has its own local ERP that ties into the MNR Provincial Plan.

This Emergency Preparedness Plan for New Lowell Dam is developed in accordance with the draft Ontario Dam Safety Guidelines and will form part of the NVCA's Flood Contingency Plan. It is the responsibility of the Conservation Authority to operate a flood forecasting and warning system.

1.3 New Lowell Dam

The dam is located in Sunnidale Township on Coates Creek, County of Simcoe. The coordinates of the dam are 44.350369W (latitude) and 4.021393°N (longitude).

The dam is a homogeneous earth and concrete gravity dam that is 170m long, with a crest width varying from 5 to 6 m. The concrete structure consists of two 3.66m x 0.31m stop log bays with 9 logs in each bay and a 0.61m x 0.61m low flow gate valve. The design standard is the 100-year storm and the design flow is 4.68 cms.

Insert Figure 1.1
Watershed-Boundary

Outflow from New Lowell Dam flows into Coates creek, and then into the Mad River, which then drains into the Minesing Swamp where it joins the Nottawasaga River. Due to the large storage capacity of water in the Minesing swamp, this causes less flooding in the downstream reaches of the Nottawasaga River.

The Upper Nottawasaga river basin drainage area that is controlled by the New Lowell dam is approximately $39.8km^2$. The Coates Creek tributary streams originate north of Creemore in Ten Hill.

The drawings of the dam are provided in Appendix A.

1.3.1 Water Levels

The New Lowell dam is operated twice a year, in the summer, when all 9 logs are in the bays and the normal water level is 201.7m. Also during the winter drawdown, when 3 logs are removed from each bay and the normal water level is 200.7m.

1.3.2 Available Gauges

Currently there is no staff gauge installed on the New Lowell dam, but one is proposed to be installed this year.

1.3.3 Access

Access to the New Lowell Dam is via Township Road south off County road 9 in the village of New Lowell. The dam is placed less than 500m from the road. The bridge over the creek gives a good view of the downward face of the dam. Access to the New Lowell Conservation Area is from the north shore of the reservoir in the conservation area parking lot, or by the access gate below the dam.

1.4 Hazard Potential

There are three types of hazards that can occur at the dam:

1. Non-Dam Failure During An Extreme Flood Event

2. Dam Failure During A Non-Flood Event

3. Dam Failure During A Flood Event

Non-dam failure during an extreme flood event is the most common type of hazard that would generally occur at this type of structure.

Failure during a non-flood event is also known as a dry weather break. Because there is no warning with this type of failure, the potential hazard for loss of life is the greatest.

A dam failure during a flood event will produce maximum upstream and downstream flood elevations thereby increasing the potential for loss of life and property damage.

1.4.1 Upstream Hazard

The upstream hazard would be related to a non-dam failure during an extreme flood event and a dam failure during a non-flood event.

The non-dam failure during an extreme flood event could cause property damage to the surrounding conservation area and campground from the reservoir overflow.

A dam failure during a non-flood event will release the minimum flood wave at the dam and may pose a danger to those individuals that would be in close proximity of the dam. These parties may include boaters and/or fishermen immediately upstream of the dam and NVCA staff.

1.4.2 Downstream Hazard

The downstream hazard can be related to all three types of dam failure.

The non-dam failure during an extreme flood event would require the release of high flows through the control structure that will cause downstream environmental and property damage.

A dam failure during a non-flood event will release a minimal flood wave from the dam site and will pose a danger to those individuals that would be in close proximity of the dam. These persons may include NVCA staff. There will be some downstream environmental and property damages.

Similarly, a dam failure during a flood event would produce the largest flood wave release from the dam site and will pose a threat to life for those individuals that would be in close proximity of the dam. There would definitely be downstream environmental and property damages.

2 Responsibilities

2.1 Staff

NVCA staff is responsible for:

- Ensuring that the equipment for communication, etc. are well maintained and in working condition, and supplies and materials needed in an emergency situation are sufficient and put in the appropriate place or are readily available from local suppliers.
- Ensuring that access to the site is maintained.
- Ensuring the safe operation of the dam if required.
- Identifying emergency conditions and taking appropriate action.
- Notifying the Flood Warning Coordinator for any emergency condition that is occurring or has occurred.
- Taking appropriate actions to mitigate the damages resulting from such emergency conditions.
- Notifying anyone immediately downstream of the dam that may be in immediate danger.
- Making routine inspections of the dam for potential problems (e.g., dam body, concrete conditions, spillway, foundations, seepage and sign of failure, etc).
- Reporting to the Director of Engineering and Technical Services of any dam deficiencies whenever they are observed.

2.2 Principal Conservation Authority

As several Conservation Authorities may manage watercourses within the jurisdiction of an individual Regional / Municipal Government, a principal Conservation Authority has been assigned to streamline and coordinate communication with local agencies. The responsibilities of the principal Conservation Authority are:

- Coordinate communications with their assigned Municipal or Regional emergency preparedness staff and assess the need to begin the emergency response process and whether the need exists for a Regional / Municipal Emergency Operations Centre (EOC) group to assemble.

- Coordinate the assemblage and forwarding of all appropriate Conservation Authority (both Principal and Secondary) communications (flood messages) to the Regional / Municipal Emergency staff and to the Regional / Municipal EOC when opened.

- Coordinate with surrounding secondary Conservation Authorities to develop and schedule telephone conferences or discussions to ascertain specific flood related information as well as updated weather forecast information.

- Consolidate flooding and weather information into a briefing note which will be forwarded to the representative at the Regional / Municipal EOC.

- If the Regional EOC is opened, participate at the Regional EOC and through it, assist in communicating to the Municipal EOCs.

2.3 Flood Warning Coordinator

During a flood emergency, the Flood Warning Coordinator is responsible for:

- Setting up a base of operation at the Tiffin Centre for Conservation;

- Coordination of communication with the following:

  a) Local Response Coordinators at the District Offices of the Ministry of Natural Resources

  b) Chief Administrative Officer of the NVCA

  c) Chair and / or Vice Chair of the NVCA

  d) Flood Emergency Coordinator of each Municipality

  e) NVCA Flood Patrol Officers

  f) News Media

- Requesting provincial assistance through the Provincial/Local Response Coordinator of the Ministry of Natural Resources, when requested by the municipality if area and regional action is insufficient to meet a flood emergency.

The Flood Warning Coordinator will be assisted by NVCA Flood Patrol Officers and the Telephone Operator.

2.4 Flood Patrol Officers

During an emergency situation, NVCA staff members having a detailed knowledge of certain watercourses will be assigned to specific areas to assess situations and will report problems or possible problem areas to the base of operation.

2.5 Municipality

Municipalities have the primary responsibility for response to flood emergencies, and also for the welfare of residents and protection of property. Upon receiving a Flood Advisory or Flood Warning, municipalities shall:

- Notify appropriate municipal officials, departments and agencies in accordance with their municipal emergency plan.
- Determine the appropriate response and if warranted, deploy municipal resources.
- If required, declare a flood emergency and implement their Emergency Procedures Plan.
- Request provincial assistance if municipal resources are inadequate.
- Communicate with Conservation Authority Flood Coordinators.

2.6 Local Response Coordinator

The local Response Coordinator is the District Manager of the Ministry of Natural Resources, Huronia-Midhurst District. The local Response Coordinator is responsible for:

- Alerting NVCA regarding general provincial alerts.
- Alerting key MNR personnel and other Government Ministries which may be required for assistance.
- Assessing the flood situation, in conjunction with NVCA and adjacent Conservation Authorities.
- Responding to a request by a municipality for provincial assistance should the total resources of the municipality be committed or inadequate and the municipality has declared an emergency situation.
- Coordinating the delivery of the provincial response in a declared emergency.

3 Emergency Condition Identification and Evaluation

Emergency conditions that might occur are described as follows:

(a) Flood Event Without Dam Failure

NVCA staff shall follow the requirements of the Operation, Maintenance and Surveillance Manual until all of the actions to control flows have been exhausted. If the water level in the lake is rising, or is forecast to rise, above 201.96m, the operator should follow the procedures described herein for imminent dam failure.

(b) Imminent Dam Failure

Dam failure results in a sudden release of impounded water. The resulting flood hydrograph peak, due to the dam failure, may be very high leading to flood damages. The amount of warning time available in the event of an unexpected failure of the concrete structures or earth embankment is difficult to quantify. For example, it is unlikely a slight overtopping of the structure would result in a catastrophic failure event. Therefore, it is not possible to use water level as a warning indication. It is more likely that failure would occur as a result of structural or foundation problems. Such failures typically occur very rapidly, often in a matter of minutes. Dam failures are often preceded by warning signs such as increasing leakage or cracking. Therefore, routine monitoring will significantly reduce the risk of an unexpected failure.

For New Lowell Dam, an earthen structure such signs which may occur include:

- Increased seepage.
- Whirlpool development in the reservoir.
- Appearance of new springs or boils downstream of the dam.
- Appearance of new cracks or extension of existing cracks.
- Visible signs of distress, such as movement of a part of a dam or slumping.

During regular site inspections, NVCA staff is responsible for identifying any such warning signs and notifying the Director of Engineering and Technical Services. If an emergency appears imminent, the Flood Warning Coordinator. If during an inspection, NVCA staff discovers something unusual that he/she is not familiar with, the Director of Engineering and Technical Services should be contacted immediately for advice. An emergency should not be ruled out unless it can be determined that it is not an emergency.

(c) Dam Failure

Should New Lowell Dam fail, the downstream consequences would be:

1. Damage to the CN Railway concrete arch culvert 400m downstream of the dam, as well as the concrete culvert just below the dam.

2. Environmental damage along Coates Creek downstream of the dam.

3. Residential and property damage downstream of dam.

(d) Non-dam Failure Emergency

These might include:

- Boating accident
- Swimming accident
- Personal injury

In such a case, NVCA staff may contact the local emergency medical response authorities (telephone 911), and the Director of Engineering and Technical Services.

For specific problems, evaluation and notification procedures, data to record and actions to follow are indicated in the Emergency Action Table (EAT).

4 Notification Procedures

In the event that an emergency situation is identified, NVCA staff must inform the Flood Warning Coordinator.

The Flood Warning Coordinator will be responsible for notifying the Local Response Coordinator of the MNR and all other agencies required. The Flood Warning Coordinator and the Local Response Coordinator will assess the level of the emergency condition and the appropriate actions that should be taken to mitigate the potential damages.

Depending on the type of emergency or emergency conditions, other contacts and actions may be required.

4.1 Warning Procedure

- For a flood event where the water level is lower than 201.96m, no flood warning is required.

- For a flood event where the water level is higher than 201.96m, a warning should be issued by the Flood Warning Coordinator.

- For a dam failure event, the dam operator should issue an immediate warning to downstream residents and any residents in the immediate vicinity of the dam.

The Flood Warning Coordinator will be responsible for issuing a flood emergency warning through the news media. Immediate warnings to the public can be initiated with the assistance of the OPP.

4.2 Evacuation Procedure

During an extreme flood and/or a dam failure event, evacuation in the potential inundation area downstream along the Coates Creek may be necessary. An evacuation order should be coordinated through the OPP by the Flood Warning Coordinator.

4.3 Restricting Access

In the event of an emergency, restricting access to the flooded area may be required for public safety. This can be accomplished by closing the access road to the dam and any other downstream local roads (e.g. Hogback Rd.).

4.4 Documentation

All reports or journal entries should include the following information:

- Current water levels.
- Rate of water level change.
- Actions that have been taken.
- Who has been informed.
- Date, time and weather conditions.
- Author of the report.
- Photographic record.

4.5 NVCA Flood Contingency Plan

This New Lowell Dam EPP is to be carried out in concert with the NVCA Flood Contingency Plan (FCP).

The NVCA FCP contains detailed procedures to be followed by various parties in the event of extreme weather with flooding potential. The NVCA FCP also contains additional contact numbers for use by the Flood Warning Coordinator.

4.6 Emergency Contact Numbers

1.	Water Resources Technologist:	Brian Smith	BUS: 705-424-1779 Ext. 226 FAX: 705-424-2115 CEL: 705-309-0405 RES: 705-424-5154
2.	Director of Engineering and Technical Services:	Glenn Switzer	BUS: 705-424-1479 Ext. 232 FAX: 705-424-2115 CEL: 705-309-0077 RES: 705-720-2265

3.	Chief Administrative Officer:	Wayne Wilson	BUS: 705-424-1479 Ext. 225 FAX: 705-424-2115 CEL: 705-309-0403 RES: 705-725-9910
3.	Senior Project Engineer Central Region, MNR:	Quazi Alam	BUS: 705-755-3244
4.	Area Supervisor, Huronia-Midhurst District, MNR	John Kus	BUS: 705-725-7534 RES: 705-725-7584
5.	Township of New Tecumseth:		TEL: 705-435-6219
6.	Provincial Response Centre:		BUS: 705-945-5750 FAX: 705-945-5785
7.	Ontario Provincial Police:		TEL: 888-310-1122
8.	Medical Emergencies		TEL: 911

Refer to the NVCA Flood Contingency Plan for additional emergency contact numbers.

4.7 Downstream Occupants (within 0.5 km of the dam)

ID No.	NAME	ADDRESS	TELEPHONE

NVCA Staff to confirm annually

Note:
1) **Blue ID numbers indicate a permanent residence**
2) **Green ID numbers indicate a recreational property**

Insert a map showing the location of the downstream properties. NVCA staff to label with identification numbers that would link the properties to the information in Section 4.7.

5 Preparedness Actions

5.1 Communications

Communication equipment must be kept in working order and ready to be used at any time during flood season. There is no telephone communication at the dam site. NVCA staff has access to portable radios and cellular phones to be used for regular duties and for emergencies.

5.2 Surveillance

The surveillance procedure described in the OMS manual should be followed.

5.3 Access to the Site

Parking lot access to the dam can be found in the conservation area. Direct access is found on Hogback Road, directly below the dam.

If the lake water level is at or near the spillway crest, the dam should be accessed by NVCA staff directly from Clarendon St. and walking down to the dam.

5.4 Response During Darkness

NVCA staff will require battery-operated lights. They should be well maintained, kept in working condition and routinely checked. If an emergency situation occurs during periods of darkness, NVCA staff should follow the same procedures that are described in the Emergency Action Table.

5.5 Response During Adverse Weather

The response to emergency conditions during adverse weather could include extremes of cold, snow, ice and storms. Special precautions when responding to an emergency under these conditions would include:

a) Tools to clear structure access of ice and snow

b) Extra dry clothes

c) Knowledge of symptoms of hypothermia

5.6 Emergency Supplies and Resources

In the event of an emergency, supplies (such as rock fill), equipment (such as backhoes and bulldozers) and personnel may be required.

No life rings are available on-site.

A first-aid kit is located in every NVCA vehicle.

5.7 Preventive Actions

Preventive actions include but are not limited to the installation of equipment and/or the establishment of procedures for one or more of the following purposes.

- Preventing emergency conditions from developing, if possible, or warning of the development of emergency situations.

- Facilitating emergency measures at the dam to limit impacts in an emergency situation.

- Minimizing the extent of damage resulting from any emergency situation that does develop.

Every emergency situation is unique or has unique features, just as every dam has unique characteristics and conditions. Therefore, there are no preventive actions that can be prescribed for all cases. However, the following are some examples of actions that may help alleviate certain failure scenarios. These examples are generic in nature and are by no means all-inclusive.

Potential Overtopping of Dam by Flood Waters:

a) Open low flow gate valve to its maximum capacity.

b) Place sandbags along the crest and edge of emergency spillway to increase freeboard and force more water through the spillway and outlet.

c) Create additional spillway capacity by making a controlled breach in a low embankment section where the foundation materials are erosion resistant. *CAUTION: Use only as a last resort.*

Reduction in Freeboard and/or Loss of Dam Crest Width:

a) Lower the water level to an elevation below the damaged area through opening the low flow gate valve.

b) Place additional riprap or sandbags in damaged areas to prevent further embankment erosion.

c) Restore freeboard with sandbags or earth and rockfill.

d) Continue close inspection of the damaged area until the storm is over.

A Slide on the Upstream or Downstream Slope of the Embankment:

a) Lower the water level at a rate and to an elevation that is considered safe given the slide condition. Pumping, siphoning, or controlled breach may be required.

b) Restore lost freeboard if required by placing sandbags or filling in the top of the slide.

c) Stabilize slides on the downstream slope by weighing the toe area with additional soil, rock or gravel.

Erosion, Seepage or Leakage (Piping) through the Embankment, Foundation or Abutments:

a) Identify extent of erosion or area(s) of seepage and color of effluent.

b) Lower the water level by whatever means possible (e.g. open the low flow valve, pumping, etc.) until the flow decreases to a non-erosive velocity or until it stops.

c) Plug the flow with whatever material is available (e.g. hay bales, bentonite or plastic sheeting if the entrance to the leak is in the reservoir).

d) Place a blanket filter (i.e. a protective sand and gravel filter) over the exit area to hold material in place.

e) Continue lowering the water level until a safe elevation is reached.

f) Continue operating at a reduced level until repairs are made. Never leave the site unattended until the situation is under control.

A Failure of an Appurtenant Structure such as an Outlet or Spillway:

a) Implement temporary measures to protect the damaged structure, such as closing an outlet or providing temporary protection for a damaged spillway.

b) Employ experienced professional divers if necessary to assess the problem and possibly implement repairs.

c) Lower the water level to a safe elevation. Pumping, siphoning or a controlled breach may be required.

A Mass Movement of the Dam on its Foundation (Spreading or Mass Sliding Failure):

a) Immediately lower the water level by whatever means possible until excessive movement stops.

b) Continue lowering the water level until a safe level is reached.

c) Continue operation at a reduced level until repairs are made.

6 Inundation Maps

A Hazard Potential Classification of a dam of Significant or High requires an incremental hazard assessment. The assessment assists in the determination of the Inflow Design Flood (IDF). As a by-product of the assessment, inundation maps are prepared to illustrate the extent of flooding under various dam break scenarios and the IDF.

New Lowell Dam is classified as a High Hazard Potential. An incremental hazard assessment is required, but no dam break analyses have been undertaken at this time, therefore no inundation maps are prepared.

Problem	How to Evaluate	Notification	Data to Record	Action
Flooding	• Water level exceeds 201.96m	Flood Warning Coordinator **NVCA**	• Water flow discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Follow Operation, Maintenance and Surveillance (OMS) Manual procedures to open all outlets until water level begins to recede. If water level continues to rise after all outlets are open, follow procedure for imminent dam failure.
	• Water level exceeds top of dam at elevation 203.25 m	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels. • In consultation with Flood Warning Coordinator, create additional spill capacity by controlled breach of dam. Follow procedures for Imminent Dam Failure.
Imminent Dam Failure	• Excessive Seepage • Whirlpool in Headpond • Extensive Cracking • Boils or Springs Downstream • Discharge of Fines • Movement of Dam	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Restrict Access • Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels. • Plug boils or springs with any available materials. • Stabilize dam by placing soil in toe area.
Dam Failure	• Dam Breached	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Description and location of dam breach	• Restrict Access
Non-dam Emergency	• Swimming Emergency • Personal Injury	Emergency Medical Response Team **911** Director of Engineering and Technical Services **NVCA**	• Nature of Problem • Photographs • Names • Cause(s) of accident • Length of time for response	• Follow standard procedures for First Aid

EMERGENCY PREPAREDNESS PLAN
New Lowell Dam

DISTRIBUTION			
Dam Operator	1 Copy		
NVCA Administrative Office	1 Copy		
REVISIONS			
Revision	Date	Individual	Approved by

Nottawasaga Valley Conservation Authority

Appendix C – Emergency Preparedness Plan for Tottenham Dam

Trow

Emergency Preparedness Plan - Tottenham Dam

Nottawasaga Valley Conservation Authority

Nottawasaga Valley Conservation Authority

Emergency Preparedness Plan

Tottenham Dam

Trow

EMERGENCY PREPAREDNESS PLAN
Tottenham Dam

DISTRIBUTION			
Dam Operator	1 Copy		
NVCA Administrative Office	1 Copy		
REVISIONS			
Revision	Date	Individual	Approved by

Nottawasaga Valley Conservation Authority

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FIGURES

APPENDICES

1 Introduction

Tottenham Dam is located at the outlet of Tottenham Pond on Beeton Creek, on Lot 4, Concession III in the Township of New Tecumseth, County of Simcoe. It is situated within the Village of Tottenham.

Under the draft Ontario Dam Safety Guidelines (ODSG) Tottenham Dam has a LOW Hazard Potential Classification with an Inflow Design Flood (IDF) of the Timmins Storm

As part of an overall dam safety program that is being implemented by the Nottawasaga Valley Conservation Authority (NVCA) and Ministry of Natural Resources (MNR), an Emergency Preparedness Plan (EPP) was prepared for Tottenham Dam on the basis of the results of the various analyses performed and the requirements of the draft ODSG. From time to time, this plan may be updated. Details of the various revisions to the plan and the holders of this document are contained in the inside cover of the document. This document is site specific for Tottenham Dam and makes reference to the NVCA's Flood Contingency Plan (FCP), which is the master emergency response document of the Conservation Authority.

1.1 Purpose

According to the requirements of the draft ODSG:

"*An EPP shall describe the actions to be taken by the dam owner and operator in an emergency. The EPP shall assign responsibility for each action to be taken by an individual (identified by organizational position) and/or a backup.*"

For the normal day to day operation of the dam, the dam operator would refer to the Operation, Maintenance and Surveillance Manual.

A comprehensive EPP is necessary to ensure that all parties responsible for water control along the watershed are involved in an action plan to ensure the safety of the public in the event of a dam emergency.

The purpose of the EPP report is to describe the procedures that should be followed and the actions that should be taken when an emergency situation is identified at the Tottenham dam site.

Specifically, this plan is intended to allow the dam operator (or other designated staff) to clearly identify what constitutes an emergency situation (Section 3) and details:

- NVCA staff responsibilities for notification in the event of an emergency (Section 4).

- Any additional responsibilities of staff for warning or evacuating people within the immediate vicinity of the dam (Section 5).

- Locations of equipment suppliers and materials available to staff to assist in mitigating the effects of an emergency (Section 5.6)

- Drawings showing the characteristics of the dam (Appendix).

Characteristics of the dam and surrounding area, details of access to the site and details of the potential for flooding in the event of a dam failure are described in this section.

1.2 Authority

Under the Emergency Management Act, each Ministry must develop a Provincial Emergency Response Plan (ERP) for their assigned area of special responsibility. MNR has been designated as the lead for flood, fire, drought, dam failures, oil and gas, and landslides/subsidence/unstable slopes.

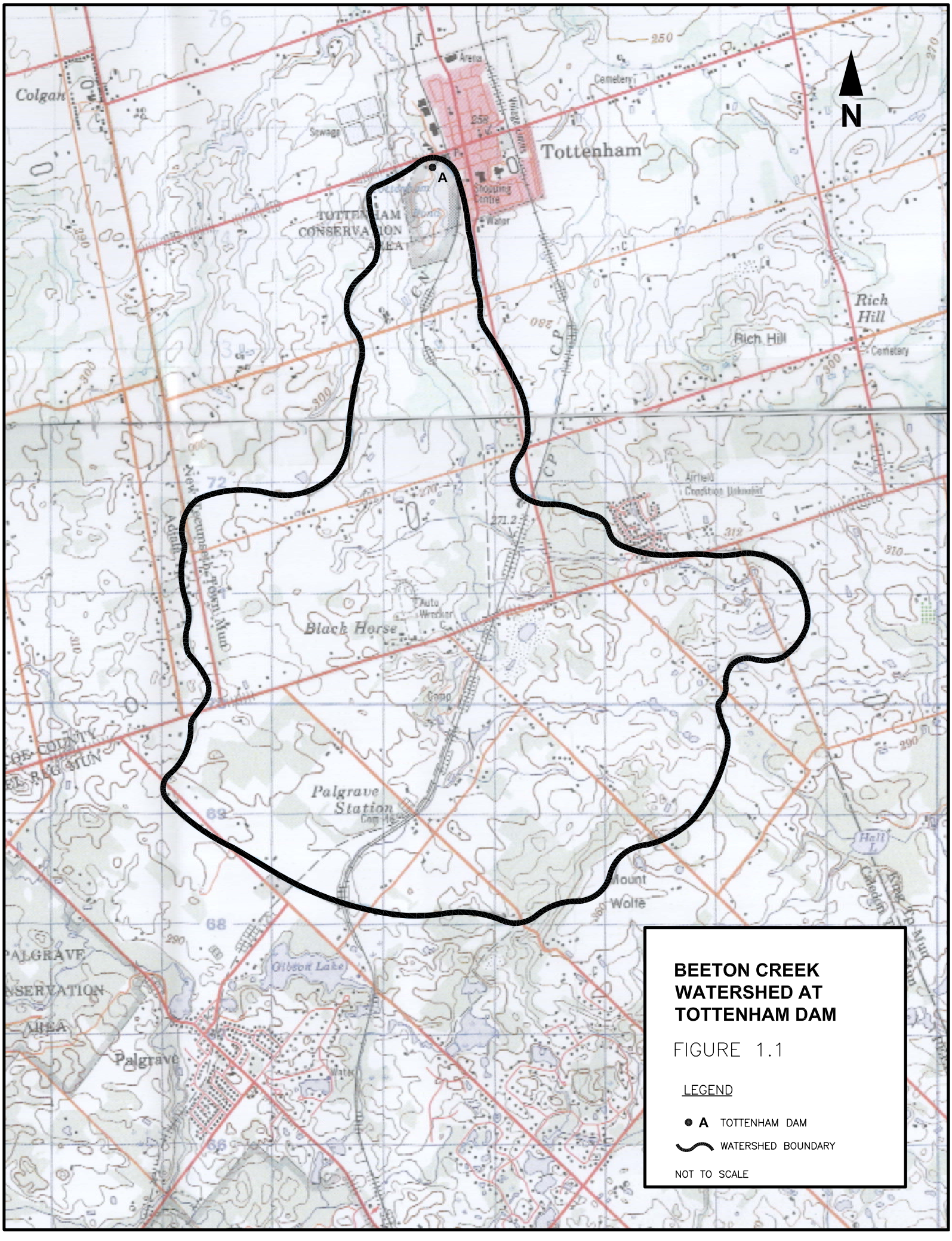
Each MNR district office has its own local ERP that ties into the MNR Provincial Plan.

This Emergency Preparedness Plan for Tottenham Dam is developed in accordance with the draft Ontario Dam Safety Guidelines and will form part of the NVCA's Flood Contingency Plan. It is the responsibility of the Conservation Authority to operate a flood forecasting and warning system.

1.3 Tottenham Dam

The dam (Figure 1.1) is located in the Township of New Tecumseth, County of Simcoe. The coordinates of the dam are 44.021°W (latitude) and 79.809°N (longitude).

The dam is a 9 m high earth embankment dam with a low flow valve and concrete drop inlet /morning glory structure as the primary outlet along with an emergency spillway. The crest of the embankment is estimated at elevation 253.60 m (832.02 ft).


N
A
Tottenham
Rich Hill
Black Horse
Palgrave Station
Mount Wolfe
Palgrave
Gibson Lake
TOTTENHAM CONSERVATION AREA
BEETON CREEK WATERSHED AT TOTTENHAM DAM
FIGURE 1.1
LEGEND
A TOTTENHAM DAM
WATERSHED BOUNDARY
NOT TO SCALE

The Beeton Creek watershed has its origin in the Township of Caledon in Peel Region. From the headwaters, Beeton Creek flows in a northerly direction into Tottenham Pond. Outflow from Tottenham Pond continues north where it merges with Bailey Creek, eventually discharges into Innisfill Creek and ultimately into the Nottawasaga River.

The Beeton Creek Watershed at the dam drains an area of 19.8 sq. km. The lake is referred to as Tottenham Pond and is located within the Village of Tottenham. The watershed, which forms part of the Innisfill Creek watershed, is bounded to the west by the Bailey Creek system and to the east by the Penville Creek system.

The drawings of the dam are provided in Appendix A.

1.3.1 Water Levels

There is no seasonal operation of the Tottenham Dam. The top of the drop inlet structure maintains the water level in Tottenham Pond at elevation 251.92 m (826.51 ft). No winter drawdown is carried out unless deemed necessary by NVCA.

1.3.2 Available Gauges

There is no staff gauge at Tottenham Dam as the dam is considered non-operational.

1.3.3 Access

The dam (Figure 1.2) is located in the Township of New Tecumseth within the Tottenham Conservation Area. The conservation area can be reached from the Town of Alliston by heading south along Tottenham Road (Regional Road 10) to the Village of Tottenham. Access to the dam is gained via Mill Street at the western edge of the Village.

1.4 Hazard Potential

There are three types of hazards that can occur at the dam:

1. Non-Dam Failure During An Extreme Flood Event

2. Dam Failure During A Non-Flood Event

3. Dam Failure During A Flood Event

N

TOTTENHAM DAM
LOCATION PLAN

FIGURE 1.2

LEGEND

ROUTE

SCALE N.T.S.

Non-dam failure during an extreme flood event is the most common type of hazard that would generally occur at this type of structure.

Failure during a non-flood event is also known as a dry weather break. Because there is no warning with this type of failure, the potential hazard for loss of life is the greatest.

A dam failure during a flood event will produce maximum upstream and downstream flood elevations thereby increasing the potential for loss of life and property damage.

1.4.1 Upstream Hazard

The upstream hazard would be related to a non-dam failure during an extreme flood event and a dam failure during a non-flood event.

The non-dam failure during an extreme flood event could cause property damage to the surrounding conservation area. The flood elevations along the shoreline of Tottenham Pond that may cause property damage are as follows:

TOTTENHAM POND FLOOD ELEVATIONS

FLOOD EVENT	FLOOD ELEVATION
500 year	252.85 m
1000 year	252.99 m
Timmins Storm (IDF)	253.49 m

A dam failure during a non-flood event will release the minimum flood wave at the dam and may pose a danger to those individuals that would be in close proximity of the dam. These parties may include boaters and/or fishermen immediately upstream of the dam and NVCA staff.

1.4.2 Downstream Hazard

The downstream hazard can be related to all three types of dam failure.

The non-dam failure during an extreme flood event would require the release of high flows through the control structure that will cause downstream environmental and property damage.

A dam failure during a non-flood event will release a minimal flood wave from the dam site and will pose a danger to those individuals that would be in close proximity of the dam. These persons may include NVCA staff. There will be some downstream environmental and property damages.

Similarly, a dam failure during a flood event would produce the largest flood wave release from the dam site and will pose a threat to life for those individuals that would be in close proximity of the dam. There would definitely be downstream environmental and property damages.

2 Responsibilities

2.1 Staff

NVCA staff is responsible for:

- Ensuring that the equipment for communication, etc. are well maintained and in working condition, and supplies and materials needed in an emergency situation are sufficient and put in the appropriate place or are readily available from local suppliers.
- Ensuring that access to the site is maintained.
- Ensuring the safe operation of the dam if required.
- Identifying emergency conditions and taking appropriate action.
- Notifying the Flood Warning Coordinator for any emergency condition that is occurring or has occurred.
- Taking appropriate actions to mitigate the damages resulting from such emergency conditions.
- Notifying anyone immediately downstream of the dam that may be in immediate danger.
- Making routine inspections of the dam for potential problems (e.g., dam body, concrete conditions, spillway, foundations, seepage and sign of failure, etc).
- Reporting to the Director of Engineering and Technical Services of any dam deficiencies whenever they are observed.

2.2 Principal Conservation Authority

As several Conservation Authorities may manage watercourses within the jurisdiction of an individual Regional / Municipal Government, a principal Conservation Authority has been assigned to streamline and coordinate communication with local agencies. The responsibilities of the principal Conservation Authority are:

- Coordinate communications with their assigned Municipal or Regional emergency preparedness staff and assess the need to begin the emergency response process and whether the need exists for a Regional / Municipal Emergency Operations Centre (EOC) group to assemble.

- Coordinate the assemblage and forwarding of all appropriate Conservation Authority (both Principal and Secondary) communications (flood messages) to the Regional / Municipal Emergency staff and to the Regional / Municipal EOC when opened.

- Coordinate with surrounding secondary Conservation Authorities to develop and schedule telephone conferences or discussions to ascertain specific flood related information as well as updated weather forecast information.

- Consolidate flooding and weather information into a briefing note which will be forwarded to the representative at the Regional / Municipal EOC.

- If the Regional EOC is opened, participate at the Regional EOC and through it, assist in communicating to the Municipal EOCs.

2.3 Flood Warning Coordinator

During a flood emergency, the Flood Warning Coordinator is responsible for:

- Setting up a base of operation at the Tiffin Centre for Conservation;

- Coordination of communication with the following:

  a) Local Response Coordinators at the District Offices of the Ministry of Natural Resources

  b) Chief Administrative Officer of the NVCA

  c) Chair and / or Vice Chair of the NVCA

  d) Flood Emergency Coordinator of each Municipality

  e) NVCA Flood Patrol Officers

  f) News Media

- Requesting provincial assistance through the Provincial/Local Response Coordinator of the Ministry of Natural Resources, when requested by the municipality if area and regional action is insufficient to meet a flood emergency.

The Flood Warning Coordinator will be assisted by NVCA Flood Patrol Officers and the Telephone Operator.

2.4 Flood Patrol Officers

During an emergency situation, NVCA staff members having a detailed knowledge of certain watercourses will be assigned to specific areas to assess situations and will report problems or possible problem areas to the base of operation.

2.5 Municipality

Municipalities have the primary responsibility for response to flood emergencies, and also for the welfare of residents and protection of property. Upon receiving a Flood Advisory or Flood Warning, municipalities shall:

- Notify appropriate municipal officials, departments and agencies in accordance with their municipal emergency plan.
- Determine the appropriate response and if warranted, deploy municipal resources.
- If required, declare a flood emergency and implement their Emergency Procedures Plan.
- Request provincial assistance if municipal resources are inadequate.
- Communicate with Conservation Authority Flood Coordinators.

2.6 Local Response Coordinator

The local Response Coordinator is the District Manager of the Ministry of Natural Resources, Huronia-Midhurst District. The local Response Coordinator is responsible for:

- Alerting NVCA regarding general provincial alerts.
- Alerting key MNR personnel and other Government Ministries which may be required for assistance.
- Assessing the flood situation, in conjunction with NVCA and adjacent Conservation Authorities.
- Responding to a request by a municipality for provincial assistance should the total resources of the municipality be committed or inadequate and the municipality has declared an emergency situation.
- Coordinating the delivery of the provincial response in a declared emergency.

3 Emergency Condition Identification and Evaluation

Emergency conditions that might occur are described as follows:

(a) Flood Event Without Dam Failure

NVCA staff shall follow the requirements of the Operation, Maintenance and Surveillance Manual until all of the actions to control flows have been exhausted. If the water level in the lake is rising, or is forecast to rise, above 253.49 m GSC, the operator should follow the procedures described herein for imminent dam failure.

(b) Imminent Dam Failure

Dam failure results in a sudden release of impounded water. The resulting flood hydrograph peak, due to the dam failure, may be very high leading to flood damages. The amount of warning time available in the event of an unexpected failure of the concrete structures or earth embankment is difficult to quantify. For example, it is unlikely a slight overtopping of the structure would result in a catastrophic failure event. Therefore, it is not possible to use water level as a warning indication. It is more likely that failure would occur as a result of structural or foundation problems. Such failures typically occur very rapidly, often in a matter of minutes. Dam failures are often preceded by warning signs such as increasing leakage or cracking. Therefore, routine monitoring will significantly reduce the risk of an unexpected failure.

For Tottenham Dam, an earthen structure such signs which may occur include:

- Increased seepage.
- Whirlpool development in the reservoir.
- Appearance of new springs or boils downstream of the dam.
- Appearance of new cracks or extension of existing cracks.
- Visible signs of distress, such as movement of a part of a dam or slumping.

During regular site inspections, NVCA staff is responsible for identifying any such warning signs and notifying the Director of Engineering and Technical Services. If an emergency appears imminent, the Flood Warning Coordinator. If during an inspection, NVCA staff discovers something unusual that he/she is not familiar with, the Director of Engineering and Technical Services should be contacted immediately for advice. An emergency should not be ruled out unless it can be determined that it is not an emergency.

(c) Dam Failure

Should Tottenham Dam fail, the downstream consequences would be:

1. Damage to the public crossing (Mill Street) located downstream of Tottenham Pond.

2. Environmental damage along Beeton Creek downstream of the dam.

(d) Non-dam Failure Emergency

These might include:

- Boating accident
- Swimming accident
- Personal injury

In such a case, NVCA staff may contact the local emergency medical response authorities (telephone 911), and the Director of Engineering and Technical Services.

For specific problems, evaluation and notification procedures, data to record and actions to follow are indicated in the Emergency Action Table (EAT).

Problem	How to Evaluate	Notification	Data to Record	Action
Flooding	• Water level exceeds 252.60 m	Flood Warning Coordinator **NVCA**	• Water flow discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Follow Operation, Maintenance and Surveillance (OMS) Manual procedures to open all outlets until water level begins to recede. If water level continues to rise after all outlets are open, follow procedure for imminent dam failure.
	• Water level exceeds top of dam at elevation 253.60 m	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels. • In consultation with Flood Warning Coordinator, create additional spill capacity by controlled breach of dam. Follow procedures for Imminent Dam Failure.
Imminent Dam Failure	• Excessive Seepage • Whirlpool in Headpond • Extensive Cracking • Boils or Springs Downstream • Discharge of Fines • Movement of Dam	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Restrict Access • Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels. • Plug boils or springs with any available materials. • Stabilize dam by placing soil in toe area.
Dam Failure	• Dam Breached	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Description and location of dam breach	• Restrict Access
Non-dam Emergency	• Swimming Emergency • Personal Injury	Emergency Medical Response Team **911** Director of Engineering and Technical Services **NVCA**	• Nature of Problem • Photographs • Names • Cause(s) of accident • Length of time for response	• Follow standard procedures for First Aid

4 Notification Procedures

In the event that an emergency situation is identified, NVCA staff must inform the Flood Warning Coordinator.

The Flood Warning Coordinator will be responsible for notifying the Local Response Coordinator of the MNR and all other agencies required. The Flood Warning Coordinator and the Local Response Coordinator will assess the level of the emergency condition and the appropriate actions that should be taken to mitigate the potential damages.

Depending on the type of emergency or emergency conditions, other contacts and actions may be required.

4.1 Warning Procedure

- For a flood event where the water level is lower than 253.49 metres, no flood warning is required.

- For a flood event where the water level is higher than 253.49 metres, a warning should be issued by the Flood Warning Coordinator.

- For a dam failure event, the dam operator should issue an immediate warning to downstream residents and any residents in the immediate vicinity of the dam.

The Flood Warning Coordinator will be responsible for issuing a flood emergency warning through the news media. Immediate warnings to the public can be initiated with the assistance of the OPP.

4.2 Evacuation Procedure

During an extreme flood and/or a dam failure event, evacuation in the potential inundation area downstream along the Beeton Creek may be necessary. An evacuation order should be coordinated through the OPP by the Flood Warning Coordinator.

4.3 Restricting Access

In the event of an emergency, restricting access to the flooded area may be required for public safety. This can be accomplished by closing the access road to the dam and any other downstream local roads (e.g. Mill Street).

4.4 Documentation

All reports or journal entries should include the following information:

- Current water levels.
- Rate of water level change.
- Actions that have been taken.
- Who has been informed.
- Date, time and weather conditions.
- Author of the report.
- Photographic record.

4.5 NVCA Flood Contingency Plan

This Tottenham Dam EPP is to be carried out in concert with the NVCA Flood Contingency Plan (FCP).

The NVCA FCP contains detailed procedures to be followed by various parties in the event of extreme weather with flooding potential. The NVCA FCP also contains additional contact numbers for use by the Flood Warning Coordinator.

4.6 Emergency Contact Numbers

1.	Water Resources Technologist:	Brian Smith	BUS: 705-424-1779 Ext. 226 FAX: 705-424-2115 CEL: 705-309-0405 RES: 705-424-5154
2.	Director of Engineering and Technical Services:	Glenn Switzer	BUS: 705-424-1479 Ext. 232 FAX: 705-424-2115 CEL: 705-309-0077 RES: 705-720-2265

3.	Chief Administrative Officer:	Wayne Wilson	BUS: 705-424-1479 Ext. 225 FAX: 705-424-2115 CEL: 705-309-0403 RES: 705-725-9910
3.	Senior Project Engineer Central Region, MNR:	Quazi Alam	BUS: 705-755-3244
4.	Area Supervisor, Huronia-Midhurst District, MNR	John Kus	BUS: 705-725-7534 RES: 705-725-7584
5.	Township of New Tecumseth:		TEL: 705-435-6219
6.	Provincial Response Centre:		BUS: 705-945-5750 FAX: 705-945-5785
7.	Ontario Provincial Police:		TEL: 888-310-1122
8.	Medical Emergencies		TEL: 911

Refer to the NVCA Flood Contingency Plan for additional emergency contact numbers.

4.7 Downstream Occupants (within 0.5 km of the dam)

ID No.	NAME	ADDRESS	TELEPHONE

NVCA Staff to confirm annually

Note:
1) Blue ID numbers indicate a permanent residence
2) Green ID numbers indicate a recreational property

Insert a map showing the location of the downstream properties. NVCA staff to label with identification numbers that would link the properties to the information in Section 4.7.

5 Preparedness Actions

5.1 Communications

Communication equipment must be kept in working order and ready to be used at any time during flood season. There is no telephone communication at the dam site. NVCA staff has access to portable radios and cellular phones to be used for regular duties and for emergencies.

5.2 Surveillance

The surveillance procedure described in the OMS manual should be followed.

5.3 Access to the Site

From Alliston to the dam:

1. The travel distance is approximately 30 kilometres by regional and local roads.

2. The travel time is approximately 20 minutes.

If the lake water level is at or near the spillway crest, the dam should be accessed by NVCA staff directly from Mill Street and climbing the downstream embankment on the east end of the dam.

5.4 Response During Darkness

NVCA staff will require battery-operated lights. They should be well maintained, kept in working condition and routinely checked. If an emergency situation occurs during periods of darkness, NVCA staff should follow the same procedures that are described in the Emergency Action Table.

5.5 Response During Adverse Weather

The response to emergency conditions during adverse weather could include extremes of cold, snow, ice and storms. Special precautions when responding to an emergency under these conditions would include:

a) Tools to clean drop inlet structure access catwalk of ice and snow

b) Extra dry clothes

c) Knowledge of symptoms of hypothermia

5.6 Emergency Supplies and Resources

In the event of an emergency, supplies (such as rock fill), equipment (such as backhoes and bulldozers) and personnel may be required.

No life rings are available on-site.

A first-aid kit is located in every NVCA vehicle.

5.7 Preventive Actions

Preventive actions include but are not limited to the installation of equipment and/or the establishment of procedures for one or more of the following purposes.

- Preventing emergency conditions from developing, if possible, or warning of the development of emergency situations.

- Facilitating emergency measures at the dam to limit impacts in an emergency situation.

- Minimizing the extent of damage resulting from any emergency situation that does develop.

Every emergency situation is unique or has unique features, just as every dam has unique characteristics and conditions. Therefore, there are no preventive actions that can be prescribed for all cases. However, the following are some examples of actions that may help alleviate certain failure scenarios. These examples are generic in nature and are by no means all-inclusive.

Potential Overtopping of Dam by Flood Waters:

a) Open low flow gate valve to its maximum capacity.

b) Place sandbags along the crest and edge of emergency spillway to increase freeboard and force more water through the spillway and outlet.

c) Create additional spillway capacity by making a controlled breach in a low embankment section where the foundation materials are erosion resistant. *CAUTION: Use only as a last resort.*

Reduction in Freeboard and/or Loss of Dam Crest Width:

a) Lower the water level to an elevation below the damaged area through opening the low flow gate valve.

b) Place additional riprap or sandbags in damaged areas to prevent further embankment erosion.

c) Restore freeboard with sandbags or earth and rockfill.

d) Continue close inspection of the damaged area until the storm is over.

A Slide on the Upstream or Downstream Slope of the Embankment:

a) Lower the water level at a rate and to an elevation that is considered safe given the slide condition. Pumping, siphoning, or controlled breach may be required.

b) Restore lost freeboard if required by placing sandbags or filling in the top of the slide.

c) Stabilize slides on the downstream slope by weighing the toe area with additional soil, rock or gravel.

Erosion, Seepage or Leakage (Piping) through the Embankment, Foundation or Abutments:

a) Identify extent of erosion or area(s) of seepage and colour of effluent.

b) Lower the water level by whatever means possible (e.g. open the low flow gate valve, pumping, etc.) until the flow decreases to a non-erosive velocity or until it stops.

c) Plug the flow with whatever material is available (e.g. hay bales, bentonite or plastic sheeting if the entrance to the leak is in the reservoir).

d) Place a blanket filter (i.e. a protective sand and gravel filter) over the exit area to hold material in place.

e) Continue lowering the water level until a safe elevation is reached.

f) Continue operating at a reduced level until repairs are made. Never leave the site unattended until the situation is under control.

A Failure of an Appurtenant Structure such as an Outlet or Spillway:

a) Implement temporary measures to protect the damaged structure, such as closing an outlet or providing temporary protection for a damaged spillway.

b) Employ experienced professional divers if necessary to assess the problem and possibly implement repairs.

c) Lower the water level to a safe elevation. Pumping, siphoning or a controlled breach may be required.

A Mass Movement of the Dam on its Foundation (Spreading or Mass Sliding Failure):

a) Immediately lower the water level by whatever means possible until excessive movement stops.

b) Continue lowering the water level until a safe level is reached.

c) Continue operation at a reduced level until repairs are made.

6 Inundation Maps

A Hazard Potential Classification of a dam of Significant or High requires an incremental hazard assessment. The assessment assists in the determination of the Inflow Design Flood (IDF). As a by-product of the assessment, inundation maps are prepared to illustrate the extent of flooding under various dam break scenarios and the IDF.

Since Tottenham Dam is classified as a Low Hazard Potential, no incremental hazard assessment was required and therefore, no inundation maps were prepared.

Appendix A
Drawings

TOP 251.12
248.82 BOTTOM
(2.3m DEPTH)
251.81
TOP 251.23
BOTTOM 248.73
(2.5m DEPTH)
EX. CB TOP 251.55
(@CURB,EAST SIDE)
TWP. OF TECUMSETH
MILL STREET (III CONCESSION ROAD)
845'
820'
825'
830' (252.98)
835'
840' (256.03)
845'
℄ DITCH
HOUSE
EMERGENCY SPILLWAY
65.6
0.9
30.3
251.97
CABIONS
CABIONS
SHED
845'
840'
℄ EXIST. ROAD
1.09
252.89
252.04
251.61
251.70
CONCRETE
251.97
℄ SHEET PILE
30.0
10.2
REFER TO
DETAIL A/02E
252.04
253.33 TBM
252.81
REFER TO
DETAIL B/02E
840'
840'
835'
830'
845'
FLOW
805'
TOE DRAIN
150mmø PVC
INV 249.33
249.54
REFER TO
DETAIL E/02E
805'
249.49
249.50
250.14
810'
250.15
5 24"ø TURBINE
DISCHARGE TUBES
815'
820'
825'
830'
250.62
250.56
250.48
250.48
252.96
252.94
253.00
253.07
51.7
100.6
253.16
253.36
DROP INLET STRUCTURE &
LOW FLOW GATE VALVE
REFER TO DETAIL
C/02E & D/02E
MILL DEMOLISHED
2.68
13.5
10.14
MILLRACE (ABANDONED)
GARAGE
T O T T E N H A M P O N D
REGULATED WATER LEVEL 251.92
5 0 5 10
SCALE 1:250

DATE: 1/18/2006 2:38:04 PM PLOTTED BY: CHARLES ALLE

LEGEND:

- EX. CATCH BASIN
- + 250.00 EX. ELEVATION
- FLOW DIRECTION

NOTES:
1. CONTOURS ARE IN FEET UNLESS NOTED OTHERWISE.
2. ELEVATIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. DISTANCES ARE IN METRES UNLESS NOTED OTHERWISE.
4. RELATIVE ELEVATION BASED ON CONTOUR INFORMATION PROVIDED BY AINLEY AND ASSOCIATES.

METRIC
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

BENCH MARK NOTE:
THE TEMPORARY BENCHMARK FOR THIS SITE IS 253.328m AT THE TOP OF THE WALL AT THE EAST SIDE OF THE SHEET PILE.

No.	REVISION	DATE	APPD.
A	ISSUED FOR INFORMATION	JANUARY 2006	

SEAL

DESIGNED:
CHECKED:
DATE:

Nottawasaga Valley Conservation Authority

Trow Associates Inc.
1595 CLARK BOULEVARD
BRAMPTON, ONTARIO L6T 4V1
FAX: (905) 793-0641 TEL: (905) 793-9800

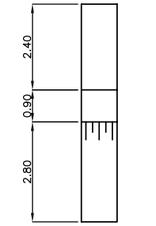
PROJECT
TOTTENHAM DAM

LOCATION
TOTTENHAM, ONTARIO

TROW PROJECT NO. BAIF00195164A
CLIENT PROJECT NO. ---

DRAWING TITLE
SITE PLAN

SCALE 1:250	DATE JANUARY 2006
DRAWN BY C.S.	REV. NO. A
DESIGNED BY S.F.	DRAWING NO. TOT-01E
CHECKED BY M.H.N.	



PLAN

A 01E DETAIL
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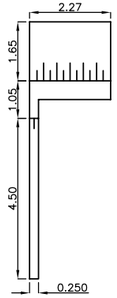
SCALE 1:75



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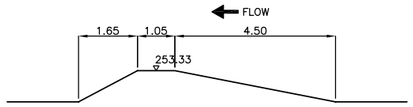

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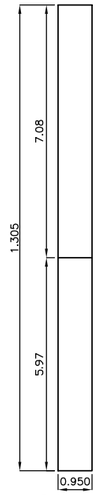
B 01E DETAIL
GABION WALL (EAST)
SCALE 1:75



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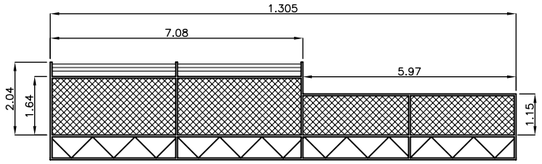
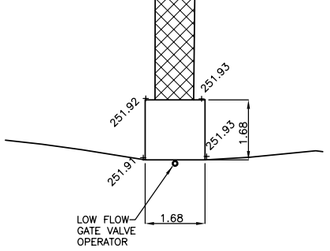


ELEVATION

C 01E DETAIL
WALKWAY PLAN AND ELEVATION
SCALE 1:75



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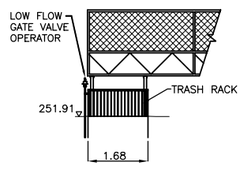
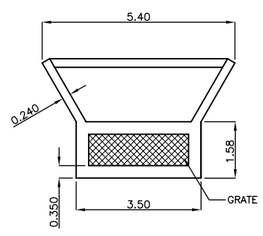
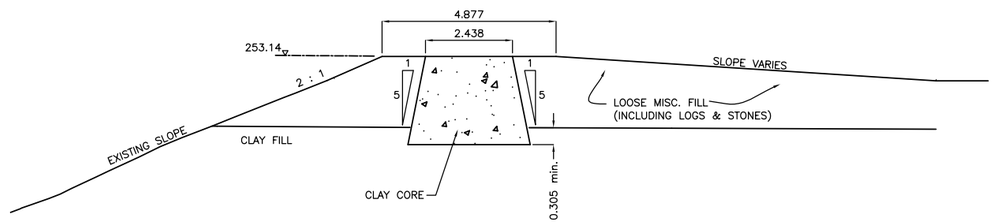


ELEVATION

D 01E DETAIL
DROP INLET STRUCTURE
SCALE 1:75



E 01E DETAIL
OUTLET STRUCTURE
SCALE 1:75



A 01E SECTION
TYPICAL SECTION THROUGH BERM
SCALE 1:75

LEGEND:

+ 250.00 EX. ELEVATION

FLOW DIRECTION

NOTES:
1. DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ELEVATIONS ARE IN METRES UNLESS NOTED OTHERWISE.

No.	REVISION	DATE	APPD.
A	ISSUED FOR INFORMATION	JANUARY 2006	

SEAL

DESIGNED:
CHECKED:
DATE:

Nottawasaga Valley Conservation Authority

Trow Associates Inc.
1595 CLARK BOULEVARD
BRAMPTON, ONTARIO L6T 4V1
FAX: (905) 793-0641 TEL: (905) 793-9800

PROJECT

TOTTENHAM DAM

LOCATION

TOTTENHAM, ONTARIO

TROW PROJECT NO. BAIF00195164A

CLIENT PROJECT NO. ---

DRAWING TITLE

DETAILS

SCALE: AS NOTED	DATE: JANUARY 2006
DRAWN BY: J.B.	REV. NO.: A
DESIGNED BY: S.F.	DRAWING NO.: TOT-02E
CHECKED BY: M.H.N.	

Appendix D – Emergency Preparedness Plan for Utopia Dam

1 Introduction

The Utopia Dam is located in Essa Township, Simcoe County and is within the Hamlet of Utopia. The dam is just off of Old Mill Road, which is off the 6th line of Essa. The dam is located on the Bear Creek which flows into the Nottawasaga River.

Under the draft Ontario Dam Safety Guidelines (ODSG) Utopia Dam has a LOW Hazard Potential Classification with an Inflow Design Flood (IDF) of the Regional Flood, which is the Timmins Storm

As part of an overall dam safety program that is being implemented by the Nottawasaga Valley Conservation Authority (NVCA) and Ministry of Natural Resources (MNR), an Emergency Preparedness Plan (EPP) was prepared for Utopia Dam on the basis of the results of the various analyses performed and the requirements of the draft ODSG. From time to time, this plan may be updated. Details of the various revisions to the plan and the holders of this document are contained in the inside cover of the document. This document is site specific for Utopia Dam and makes reference to the NVCA's Flood Contingency Plan (FCP), which is the master emergency response document of the Conservation Authority.

1.1 Purpose

According to the requirements of the draft ODSG:

"*An EPP shall describe the actions to be taken by the dam owner and operator in an emergency. The EPP shall assign responsibility for each action to be taken by an individual (identified by organizational position) and/or a backup.*"

For the normal day to day operation of the dam, the dam operator would refer to the Operation, Maintenance and Surveillance Manual.

A comprehensive EPP is necessary to ensure that all parties responsible for water control along the watershed are involved in an action plan to ensure the safety of the public in the event of a dam emergency.

The purpose of the EPP report is to describe the procedures that should be followed and the actions that should be taken when an emergency situation is identified at the Utopia dam site.

Specifically, this plan is intended to allow the dam operator (or other designated staff) to clearly identify what constitutes an emergency situation (Section 3) and details:

- NVCA staff responsibilities for notification in the event of an emergency (Section 4).

- Any additional responsibilities of staff for warning or evacuating people within the immediate vicinity of the dam (Section 5).

- Locations of equipment suppliers and materials available to staff to assist in mitigating the effects of an emergency (Section 5.6)

- Drawings showing the characteristics of the dam (Appendix).

Characteristics of the dam and surrounding area, details of access to the site and details of the potential for flooding in the event of a dam failure are described in this section.

1.2 Authority

Under the Emergency Management Act, each Ministry must develop a Provincial Emergency Response Plan (ERP) for their assigned area of special responsibility. MNR has been designated as the lead for flood, fire, drought, dam failures, oil and gas, and landslides/subsidence/unstable slopes.

Each MNR district office has its own local ERP that ties into the MNR Provincial Plan.

This Emergency Preparedness Plan for Utopia Dam is developed in accordance with the draft Ontario Dam Safety Guidelines and will form part of the NVCA's Flood Contingency Plan. It is the responsibility of the Conservation Authority to operate a flood forecasting and warning system.

1.3 Utopia Dam

The dam (Figure 1.1) is located in the Township of Essa, County of Simcoe. The coordinates of the dam are 44.327 W (latitude) and 79.834°N (longitude).

The dam is a 9.1 m high earth dyke with a central concrete structure and stilling basin complete with baffle blocks. The concrete portion of the dam consists of two stop log sluiceways, each containing nine stop logs (254mm wide by 305mm high by 4267mm long), a low flow pipe and an intake pipe for the adjoining mill. There is a portion of earth to the north of the concrete structure that is used as an emergency spillway.

Insert Figure 1.1

The Bear Creek watershed has its origin on the outskirts of the city of Barrie. From the headwaters, Bear Creek flows in a general southwesterly direction into Utopia reservoir. Outflow from Utopia reservoir, over the dam runs almost straight west and then angles slightly north where it discharges into the Nottawasaga River, and then into Georgian bay.

The Bear Creek Watershed upstream of the dam drains an area of 66.6 sq. km. The reservoir is referred to as Utopia reservoir and is located within the Hamlet of Utopia. The majority of the watershed is situated in the Township of Essa with portions in the Township of Springwater, the City of Barrie and the Town of Innisfil.

The drawings of the dam are provided in Appendix A.

1.3.1 Water Levels

There is seasonal operation of the Utopia Dam. The dam is operated twice a year, once for the winter drawdown, where three stop logs are removed, to ensure the winter water level of 199.03m (653.00ft), and again in the spring/summer where the stop logs are replaced to achieve the summer water level of 199.95m (656ft.).

1.3.2 Available Gauges

There is no staff gauge currently installed at Utopia Dam, instead there is a permanent gauge that logs information of the reservoir water levels. The gauge is labeled as the Bear Creek @ Utopia Dam Gauge, and can be accessed by the NVCA.

1.3.3 Access

The dam is located in the Township of Essa within the Utopia Conservation Area. The conservation area can be reached from the 6th Line of Essa and Old Mill Road. There is an access gate on Old Mill road, with a grassed road leading down to the north side of the dam. Vehicles can cross the dam. Access is also available directly from the 6th Line of Essa, through the Utopia Conservation Area. The road that leads down the south side of the dam is heavily vegetated.

1.4 Hazard Potential

There are three types of hazards that can occur at the dam:

1. Non-Dam Failure During An Extreme Flood Event

2. Dam Failure During A Non-Flood Event

3. Dam Failure During A Flood Event

Non-dam failure during an extreme flood event is the most common type of hazard that would generally occur at this type of structure.

Failure during a non-flood event is also known as a dry weather break. Because there is no warning with this type of failure, the potential hazard for loss of life is the greatest.

A dam failure during a flood event will produce maximum upstream and downstream flood elevations thereby increasing the potential for loss of life and property damage.

1.4.1 Upstream Hazard

The upstream hazard would be related to a non-dam failure during an extreme flood event and a dam failure during a non-flood event.

The non-dam failure during an extreme flood event could cause property damage to the surrounding conservation area and grist mill surrounding the dam.

A dam failure during a non-flood event will release the minimum flood wave at the dam and may pose a danger to those individuals that would be in close proximity of the dam. These parties may include boaters and/or fishermen immediately upstream of the dam and NVCA staff.

1.4.2 Downstream Hazard

The downstream hazard can be related to all three types of dam failure.

The non-dam failure during an extreme flood event would require the release of high flows through the control structure that will cause downstream environmental and property damage.

A dam failure during a non-flood event will release a minimal flood wave from the dam site and will pose a danger to those individuals that would be in close proximity of the dam. The Bear Creek flows through an area that has few houses and buildings, therefore loss of life and property damage is minimized. These persons may include NVCA staff. There will be some downstream environmental and property damages.

Similarly, a dam failure during a flood event would produce the largest flood wave release from the dam site and will pose a threat to life for those individuals that would be in close proximity of the dam. There would definitely be downstream environmental and property damages.

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APPENDICES

2 Responsibilities

2.1 Staff

NVCA staff is responsible for:

- Ensuring that the equipment for communication, etc. are well maintained and in working condition, and supplies and materials needed in an emergency situation are sufficient and put in the appropriate place or are readily available from local suppliers.
- Ensuring that access to the site is maintained.
- Ensuring the safe operation of the dam if required.
- Identifying emergency conditions and taking appropriate action.
- Notifying the Flood Warning Coordinator for any emergency condition that is occurring or has occurred.
- Taking appropriate actions to mitigate the damages resulting from such emergency conditions.
- Notifying anyone immediately downstream of the dam that may be in immediate danger.
- Making routine inspections of the dam for potential problems (e.g., dam body, concrete conditions, spillway, foundations, seepage and sign of failure, etc).
- Reporting to the Director of Engineering and Technical Services of any dam deficiencies whenever they are observed.

2.2 Principal Conservation Authority

As several Conservation Authorities may manage watercourses within the jurisdiction of an individual Regional / Municipal Government, a principal Conservation Authority has been assigned to streamline and coordinate communication with local agencies. The responsibilities of the principal Conservation Authority are:

- Coordinate communications with their assigned Municipal or Regional emergency preparedness staff and assess the need to begin the emergency response process and whether the need exists for a Regional / Municipal Emergency Operations Centre (EOC) group to assemble.

- Coordinate the assemblage and forwarding of all appropriate Conservation Authority (both Principal and Secondary) communications (flood messages) to the Regional / Municipal Emergency staff and to the Regional / Municipal EOC when opened.

- Coordinate with surrounding secondary Conservation Authorities to develop and schedule telephone conferences or discussions to ascertain specific flood related information as well as updated weather forecast information.

- Consolidate flooding and weather information into a briefing note which will be forwarded to the representative at the Regional / Municipal EOC.

- If the Regional EOC is opened, participate at the Regional EOC and through it, assist in communicating to the Municipal EOCs.

2.3 Flood Warning Coordinator

During a flood emergency, the Flood Warning Coordinator is responsible for:

- Setting up a base of operation at the Tiffin Centre for Conservation;

- Coordination of communication with the following:

  a) Local Response Coordinators at the District Offices of the Ministry of Natural Resources

  b) Chief Administrative Officer of the NVCA

  c) Chair and / or Vice Chair of the NVCA

  d) Flood Emergency Coordinator of each Municipality

  e) NVCA Flood Patrol Officers

  f) News Media

- Requesting provincial assistance through the Provincial/Local Response Coordinator of the Ministry of Natural Resources, when requested by the municipality if area and regional action is insufficient to meet a flood emergency.

The Flood Warning Coordinator will be assisted by NVCA Flood Patrol Officers and the Telephone Operator.

2.4 Flood Patrol Officers

During an emergency situation, NVCA staff members having a detailed knowledge of certain watercourses will be assigned to specific areas to assess situations and will report problems or possible problem areas to the base of operation.

2.5 Municipality

Municipalities have the primary responsibility for response to flood emergencies, and also for the welfare of residents and protection of property. Upon receiving a Flood Advisory or Flood Warning, municipalities shall:

- Notify appropriate municipal officials, departments and agencies in accordance with their municipal emergency plan.
- Determine the appropriate response and if warranted, deploy municipal resources.
- If required, declare a flood emergency and implement their Emergency Procedures Plan.
- Request provincial assistance if municipal resources are inadequate.
- Communicate with Conservation Authority Flood Coordinators.

2.6 Local Response Coordinator

The local Response Coordinator is the District Manager of the Ministry of Natural Resources, Huronia-Midhurst District. The local Response Coordinator is responsible for:

- Alerting NVCA regarding general provincial alerts.
- Alerting key MNR personnel and other Government Ministries which may be required for assistance.
- Assessing the flood situation, in conjunction with NVCA and adjacent Conservation Authorities.
- Responding to a request by a municipality for provincial assistance should the total resources of the municipality be committed or inadequate and the municipality has declared an emergency situation.
- Coordinating the delivery of the provincial response in a declared emergency.

3 Emergency Condition Identification and Evaluation

Emergency conditions that might occur are described as follows:

(a) Flood Event Without Dam Failure

NVCA staff shall follow the requirements of the Operation, Maintenance and Surveillance Manual until all of the actions to control flows have been exhausted. If the water level in the lake is rising, or is forecast to rise, above 201.38. m GSC, the operator should follow the procedures described herein for imminent dam failure.

(b) Imminent Dam Failure

Dam failure results in a sudden release of impounded water. The resulting flood hydrograph peak, due to the dam failure, may be very high leading to flood damages. The amount of warning time available in the event of an unexpected failure of the concrete structures or earth embankment is difficult to quantify. For example, it is unlikely a slight overtopping of the structure would result in a catastrophic failure event. Therefore, it is not possible to use water level as a warning indication. It is more likely that failure would occur as a result of structural or foundation problems. Such failures typically occur very rapidly, often in a matter of minutes. Dam failures are often preceded by warning signs such as increasing leakage or cracking. Therefore, routine monitoring will significantly reduce the risk of an unexpected failure.

For Utopia Dam, an earthen and concrete structure such signs which may occur include:

- Increased seepage.
- Whirlpool development in the reservoir.
- Appearance of new springs or boils downstream of the dam.
- Appearance of new cracks or extension of existing cracks.
- Visible signs of distress, such as movement of a part of a dam or slumping.

During regular site inspections, NVCA staff is responsible for identifying any such warning signs and notifying the Director of Engineering and Technical Services. If an emergency appears imminent, contact the Flood Warning Coordinator. If during an inspection, NVCA staff discovers something unusual that he/she is not familiar with, the Director of Engineering and Technical Services should be contacted immediately for advice. An emergency should not be ruled out unless it can be determined that it is not an emergency.

(c) Dam Failure

Should Utopia Dam fail, the downstream consequences would be:

1. Damage to metal culvert of the 6th Line of Essa downstream of the dam, along with property damage. Minimal number of houses are located downstream of the dam.

2. Environmental damage along Bear Creek downstream of the dam.

(d) Non-dam Failure Emergency

These might include:

- Boating accident
- Swimming accident
- Personal injury

In such a case, NVCA staff may contact the local emergency medical response authorities (telephone 911), and the Director of Engineering and Technical Services.

For specific problems, evaluation and notification procedures, data to record and actions to follow are indicated in the Emergency Action Table (EAT).

4 Notification Procedures

In the event that an emergency situation is identified, NVCA staff must inform the Flood Warning Coordinator.

The Flood Warning Coordinator will be responsible for notifying the Local Response Coordinator of the MNR and all other agencies required. The Flood Warning Coordinator and the Local Response Coordinator will assess the level of the emergency condition and the appropriate actions that should be taken to mitigate the potential damages.

Depending on the type of emergency or emergency conditions, other contacts and actions may be required.

4.1 Warning Procedure

- For a flood event where the water level is lower than 199.95 metres, no flood warning is required.

- For a flood event where the water level is higher than 199.95 metres, a warning should be issued by the Flood Warning Coordinator.

- For a dam failure event, the dam operator should issue an immediate warning to downstream residents and any residents in the immediate vicinity of the dam.

The Flood Warning Coordinator will be responsible for issuing a flood emergency warning through the news media. Immediate warnings to the public can be initiated with the assistance of the OPP.

4.2 Evacuation Procedure

During an extreme flood and/or a dam failure event, evacuation in the potential inundation area downstream along the Bear Creek may be necessary. An evacuation order should be coordinated through the OPP by the Flood Warning Coordinator.

4.3 Restricting Access

In the event of an emergency, restricting access to the flooded area may be required for public safety. This can be accomplished by closing the access road to the dam and any other downstream local roads (e.g. 6th Line of Essa).

4.4 Documentation

All reports or journal entries should include the following information:

- Current water levels.
- Rate of water level change.
- Actions that have been taken.
- Who has been informed.
- Date, time and weather conditions.
- Author of the report.
- Photographic record.

4.5 NVCA Flood Contingency Plan

This Utopia Dam EPP is to be carried out in concert with the NVCA Flood Contingency Plan (FCP).

The NVCA FCP contains detailed procedures to be followed by various parties in the event of extreme weather with flooding potential. The NVCA FCP also contains additional contact numbers for use by the Flood Warning Coordinator.

4.6 Emergency Contact Numbers

1.	Water Resources Technologist:	Brian Smith	BUS: 705-424-1779 Ext. 226 FAX: 705-424-2115 CEL: 705-309-0405 RES: 705-424-5154
2.	Director of Engineering and Technical Services:	Glenn Switzer	BUS: 705-424-1479 Ext. 232 FAX: 705-424-2115 CEL: 705-309-0077 RES: 705-720-2265

3.	Chief Administrative Officer:	Wayne Wilson	BUS: 705-424-1479 Ext. 225 FAX: 705-424-2115 CEL: 705-309-0403 RES: 705-725-9910
3.	Senior Project Engineer Central Region, MNR:	Quazi Alam	BUS: 705-755-3244
4.	Area Supervisor, Huronia-Midhurst District, MNR	John Kus	BUS: 705-725-7534 RES: 705-725-7584
5.	Township of New Tecumseth:		TEL: 705-435-6219
6.	Provincial Response Centre:		BUS: 705-945-5750 FAX: 705-945-5785
7.	Ontario Provincial Police:		TEL: 888-310-1122
8.	Medical Emergencies		TEL: 911

Refer to the NVCA Flood Contingency Plan for additional emergency contact numbers.

4.7 Downstream Occupants (within 0.5 km of the dam)

ID No.	NAME	ADDRESS	TELEPHONE

NVCA Staff to confirm annually

Note:
1) Blue ID numbers indicate a permanent residence
2) Green ID numbers indicate a recreational property

Insert a map showing the location of the downstream properties. NVCA staff to label with identification numbers that would link the properties to the information in Section 4.7.

5 Preparedness Actions

5.1 Communications

Communication equipment must be kept in working order and ready to be used at any time during flood season. There is no telephone communication at the dam site. NVCA staff has access to portable radios and cellular phones to be used for regular duties and for emergencies.

5.2 Surveillance

The surveillance procedure described in the OMS manual should be followed.

5.3 Access to the Site

From Barrie to the dam:

1. The travel distance is approximately 15 kilometers by regional and local roads.

2. The travel time is approximately 15 minutes.

If the lake water level is at or near the spillway crest, the dam should be accessed on the south side by NVCA staff directly from the Utopia Conservation Area, on the 6th Line of Essa.

5.4 Response During Darkness

NVCA staff will require battery-operated lights. They should be well maintained, kept in working condition and routinely checked. If an emergency situation occurs during periods of darkness, NVCA staff should follow the same procedures that are described in the Emergency Action Table.

5.5 Response During Adverse Weather

The response to emergency conditions during adverse weather could include extremes of cold, snow, ice and storms. Special precautions when responding to an emergency under these conditions would include:

a) Tools to clean structure access of ice and snow

b) Extra dry clothes

c) Knowledge of symptoms of hypothermia

5.6 Emergency Supplies and Resources

In the event of an emergency, supplies (such as rock fill), equipment (such as backhoes and bulldozers) and personnel may be required.

No life rings are available on-site.

A first-aid kit is located in every NVCA vehicle.

5.7 Preventive Actions

Preventive actions include but are not limited to the installation of equipment and/or the establishment of procedures for one or more of the following purposes.

- Preventing emergency conditions from developing, if possible, or warning of the development of emergency situations.

- Facilitating emergency measures at the dam to limit impacts in an emergency situation.

- Minimizing the extent of damage resulting from any emergency situation that does develop.

Every emergency situation is unique or has unique features, just as every dam has unique characteristics and conditions. Therefore, there are no preventive actions that can be prescribed for all cases. However, the following are some examples of actions that may help alleviate certain failure scenarios. These examples are generic in nature and are by no means all-inclusive.

Potential Overtopping of Dam by Flood Waters:

a) Remove 8 logs from each bay to allow more water to flow through the concrete bays.

b) Place sandbags along the crest and edge of emergency spillway to increase freeboard and force more water through the spillway and concrete stop bays.

c) Create additional spillway capacity by making a controlled breach in a low embankment section where the foundation materials are erosion resistant. *CAUTION: Use only as a last resort.*

Reduction in Freeboard and/or Loss of Dam Crest Width:

a) Lower the water level to an elevation below the damaged area through opening the log bay stops.

b) Place additional riprap or sandbags in damaged areas to prevent further embankment erosion.

c) Restore freeboard with sandbags or earth and rockfill.

d) Continue close inspection of the damaged area until the storm is over.

A Slide on the Upstream or Downstream Slope of the Embankment:

a) Lower the water level at a rate and to an elevation that is considered safe given the slide condition. Pumping, siphoning, or controlled breach may be required.

b) Restore lost freeboard if required by placing sandbags or filling in the top of the slide.

c) Stabilize slides on the downstream slope by weighing the toe area with additional soil, rock or gravel.

Erosion, Seepage or Leakage (Piping) through the Embankment, Foundation or Abutments:

a) Identify extent of erosion or area(s) of seepage and colour of effluent.

b) Lower the water level by whatever means possible (e.g. open the low flow gate valve, pumping, removing logs etc.) until the flow decreases to a non-erosive velocity or until it stops.

c) Plug the flow with whatever material is available (e.g. hay bales, bentonite or plastic sheeting if the entrance to the leak is in the reservoir).

d) Place a blanket filter (i.e. a protective sand and gravel filter) over the exit area to hold material in place.

e) Continue lowering the water level until a safe elevation is reached.

f) Continue operating at a reduced level until repairs are made. Never leave the site unattended until the situation is under control.

A Failure of an Appurtenant Structure such as an Outlet or Spillway:

a) Implement temporary measures to protect the damaged structure, such as closing an outlet or providing temporary protection for a damaged spillway.

b) Employ experienced professional divers if necessary to assess the problem and possibly implement repairs.

c) Lower the water level to a safe elevation. Removing stop-logs, pumping, siphoning or a controlled breach may be required.

A Mass Movement of the Dam on its Foundation (Spreading or Mass Sliding Failure):

a) Immediately lower the water level by whatever means possible until excessive movement stops.

b) Continue lowering the water level until a safe level is reached.

c) Continue operation at a reduced level until repairs are made.

6 Inundation Maps

A Hazard Potential Classification of a dam of Significant or High requires an incremental hazard assessment. The assessment assists in the determination of the Inflow Design Flood (IDF). As a by-product of the assessment, inundation maps are prepared to illustrate the extent of flooding under various dam break scenarios and the IDF.

Since Utopia Dam is classified as a Low Hazard Potential, no incremental hazard assessment was required and therefore, no inundation maps were prepared.

Problem	How to Evaluate	Notification	Data to Record	Action
Flooding	• Water level exceeds 201.38 m	Flood Warning Coordinator **NVCA**	• Water flow discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Follow Operation, Maintenance and Surveillance (OMS) Manual procedures to open all outlets until water level begins to recede. If water level continues to rise after all outlets are open, follow procedure for imminent dam failure.
	• Water level exceeds top of dam at elevation 201.75m	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels. • In consultation with Flood Warning Coordinator, create additional spill capacity by controlled breach of dam. Follow procedures for Imminent Dam Failure.
Imminent Dam Failure	• Excessive Seepage • Whirlpool in Headpond • Extensive Cracking • Boils or Springs Downstream • Discharge of Fines • Movement of Dam	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Dam condition	• Restrict Access • Follow OMS Manual procedures to open outlets to maximum safe capacity to lower water levels. • Plug boils or springs with any available materials. • Stabilize dam by placing soil in toe area.
Dam Failure	• Dam Breached	Flood Warning Coordinator **NVCA** Warn anyone in immediate area	• Water discharge, headwater, tailwater elevations and rate of change • Weather conditions • Photographs • Description and location of dam breach	• Restrict Access
Non-dam Emergency	• Swimming Emergency • Personal Injury	Emergency Medical Response Team **911** Director of Engineering and Technical Services **NVCA**	• Nature of Problem • Photographs • Names • Cause(s) of accident • Length of time for response	• Follow standard procedures for First Aid

EMERGENCY PREPAREDNESS PLAN
Utopia Dam

DISTRIBUTION			
Dam Operator	1 Copy		
NVCA Administrative Office	1 Copy		
REVISIONS			
Revision	Date	Individual	Approved by

Nottawasaga Valley Conservation Authority

NVCA ICE MANAGEMENT PLAN

November 2024

Nottawasaga Valley Conservation Authority

Table of Contents

Introduction

Recent updates to the *Conservation Authorities Act* (O. Reg. 686/21) include ice management as part of regulating natural hazard risks. Conservation Authorities are mandated to review their ice management services and prepare an ice management plan if deemed necessary, per the sections quoted below.

> *O.Reg. 686/21: Risk of Natural Hazards*
>
> *4. (1) An authority shall provide programs and services for ice management within its area of jurisdiction, if the authority determines that ice management is necessary to reduce the risks associated with natural hazards referred to in subsection 1 (1).*
>
> *(2) Programs or services provided under subsection (1) shall include the development and implementation of an ice management plan on or before December 31, 2024 that identifies,*
>
> > *(a) how ice within the authority's area of jurisdiction may increase the risk of natural hazards; and*
> >
> > *(b) the steps that are necessary to mitigate these risks, including identifying equipment and resources needed to carry out these steps.*
>
> *(3) An authority may update the ice management plan referred to in subsection (2) from time to time as the authority considers it advisable.*

This document will be reviewed annually and updated on that basis when required.

Flood Contingency Plan

Roles & Responsibilities of Agencies During Flood Events

Municipal Role

Municipalities have the primary responsibility and authority for response to flooding and flood emergencies, and for the welfare of residents and protection of property. To fulfill this responsibility, municipalities should ensure that emergency plans are kept current and tested on a regular basis.

Upon receiving a Watershed Conditions Statement, Flood Watch or Flood Warning from a conservation authority municipalities shall:

1. Notify appropriate municipal officials, departments and agencies in accordance with their municipal emergency plan.
2. Determine the appropriate response to a flood threat and, if warranted, deploy municipal resources to protect life and property.
3. If required, declare a flood emergency and implement their Emergency Procedures Plan.

4. Request provincial assistance under the *Emergency Management & Civil Protection Act* (2006) if municipal resources are inadequate to respond to the emergency.
5. Maintain liaison with conservation authority flood coordinators.
6. Specific to ice jam response: work with conservation authorities to evaluate ice jam response within municipal/public rights-of-way. Coordinate emergency permits & works if/where appropriate.

Conservation Authority Role

Conservation authorities have several areas of responsibility for flooding and flood emergencies:

1. Monitor watershed and weather conditions and operate a flood forecasting system in order to provide warning of anticipated or actual flood conditions.
2. Issue Watershed Conditions Statement, Flood Watch and Flood Warning bulletins to municipalities and other appropriate agencies to advise of potential flooding.
3. Operate conservation authority dams and flood control structures to reduce the effects of flooding.
4. Provide advice to municipalities in preventing or reducing the effects of flooding.
5. Maintain communications with municipalities and the Surface Water Monitoring Centre of the MNR during a flood.
6. Specific to ice jam response: work with municipal partners to evaluate ice jam response within municipal/public rights-of-way. Coordinate emergency permits & works if/where appropriate.

Provincial Role (Surface Water Monitoring Centre)

1. Operate and maintain a Provincial Warning System to alert conservation authorities of potential meteorological events that could create a flood hazard.
2. Maintain communications with MNR's district offices regarding the status of flood situations

NVCA's Ice management Role

Nottawasaga Valley Conservation Authority (NVCA) engineering staff conduct wintertime monitoring of known ice jam locations throughout the watershed. These locations are informed by NVCA's institutional knowledge of past ice jam occurrence that resulted in flooding impacts to people and property in the vicinity of the ice jam location.

This seasonal monitoring provides information and expertise to municipalities in addressing (either mitigating or removing) ice jams. Typically, the frequency of

inspections is informed by the data gathered through the flood forecasting and warning program, as well as institutional understanding of environmental conditions. Together, this information leads to the enhanced knowledge of the probability of ice jam occurrence at the locations of interest.

Table 1 below lists ice management actions throughout the seasonally monitored locations as indicated by the watercourse within which ice jams are known to occur.

Table 1. Ice jam monitoring locations and actions taken annually by NVCA and municipal partners.

Watercourse	Municipality	Actions (NVCA & municipal partners)
Bateaux River	Collingwood	Municipality driven ice removal activities with special funding via NVCA & MNR
Pretty River	Collingwood	Municipality driven ice removal activities with special funding via NVCA & MNR
Boyne River	New Tecumseth	Monitor, document
Mad River	Clearview	Monitor, document, removal by municipality if impacting road crossings
Noisy River	Clearview	Monitor, document, removal by municipality if impacting road crossings
Pine River	Mulmur	Monitor, document
Nottawasaga River	Wasaga Beach	Monitor, document

Future Ice Management Objectives

NVCA engineering staff are in the process of developing a more comprehensive monitoring plan for known ice jam locations throughout the watershed. The monitoring plan is intended to achieve the following objectives:

- Target additional funding/grants for ice management;
- Expand monitoring at known locations to include real-time photo or video monitoring during the winter months;
- Proactively identifying and communicating roles and responsibilities with partners; and
- Proactively communicating information related to ice jams and ice management to the public via outreach activities.

Staff Report: 40-08-24-BOD

Date: 22/11/2024

To: Chair and Members of the Board of Directors

From: Sheryl Flannagan
Director, Corporate Services

SUBJECT: 2024 Year End Surplus/Deficit Allocation

Recommendation

RESOLVED THAT: the Staff Report No. 40-08-24-BOD regarding surplus/deficit allocations be approved; and

FURTHER THAT: The NVCA Auditor be directed to place any 2024 surplus/ deficit funds in/out of the following reserves as specified in the report.

Purpose of the Staff Report

The purpose of this Staff Report is to gain the Board's approval regarding the direction to the NVCA Auditors in the allocation of any deficit/surplus for the 2024 year.

Background

The NVCA Auditor requires direction from the Board regarding any year end surplus or deficit allocations including allocation of amortization.

Issues/Analysis

Staff recommend that any program surplus/deficits be placed in the following specified reserve areas to ensure that funds are available if required:

Planning Reserve - All planning program surplus/deficits must be placed into or removed from the Planning Reserves as required by MECP Planning User Fee guidance/policy, to offset planning program costs.

New Lowell Reserve - As per contract with current service providers, place all surplus revenues from New Lowell revenue.

Operational Reserve – Any potential category 1 deficits, including, if required, all remaining planning deficits if that reserve is depleted; or 25% of a category 1 surplus to ensure funds are available if required in the future.

Capital Repair and Replacement Reserve – 50% of any remaining category 1 surplus should be allocated to the Capital Reserve.

Human Resources Reserve – 25% of any remaining category 1 surplus to ensure that funds are available if required in the future.

Healthy Waters Reserve – all department 121 surplus/deficit, if any.

Environmental Education Reserve - all department 630 surplus/deficit, if any.

Forestry Reserve - all department 110 surplus/deficit, if any.

Watershed Science Reserve – all department 421 surplus/deficit, if any.

Conservation Lands Reserve – create this new reserve, all department 151 and 662 surplus/deficit, if any.

Relevance to Authority Policy/Mandate

The Board has set a minimum Reserve target of 25-30% of the annual budget as reserve funds. As the NVCA's 2024 approved budget is $6,260,044, a reserve allocation target is $1,565,011-$1,878,03. The NVCA is sitting around $1,775,000 before any surplus or deficit allocations from the 2024 budget year.

Impact on Authority Finances

Allocation of reserves helps to ensure the NVCA is financially secure should there be an emergency or other financial impact throughout a future year.

Climate Change Implications
This report has no climate change implications.

Reviewed by:
Original Signed by
Sheryl Flannagan
Director, Corporate Services

Approved for submission by:
Original Signed by
Doug Hevenor
Chief Administrative Officer

Staff Report: 41-08-24-BOD

Date: 22/11/2024

To: Chair and Members of the Board of Directors

From: Maria Leung
Senior Communications Specialist

SUBJECT: Communications Report – October 11, 2024 – November 8, 2024

Recommendation

RESOLVED THAT: Staff Report No. 41-08-24-BOD regarding NVCA Communications – October 11, 2024 – November 8, 2024, be received.

Purpose of the Staff Report
This staff report presents a summary of NVCA media coverage and public outreach during the period of October 11, 2024 – November 8, 2024.

The following outlines the communications and media coverage during the period.

1. Flood Messages

There were no flood messages issued in this time period

2. Media coverage of NVCA news releases

Investing in the future of our environment with TD Tree Days, issued on November 6, 2024

Title	Media Outlet	Date	Reference
Root cause: Volunteers plant trees, shrubs near Barrie's Little Lake Park	Barrie Today	November 6, 2024	Sarah Campbell, Aquatic Biologist

Column: Finding community in volunteering, issued on October 30, 2024

Title	Media Outlet	Date	Reference
COLUMN: Volunteers are lifeblood of conservation authority's work	Collingwood Today	October 31, 2024	
COLUMN: Volunteers are lifeblood of conservation authority's work	Bradford Today	November 1, 2024	
COLUMN: Volunteers are lifeblood of conservation authority's work	Collingwood Today	November 1, 2024	
COLUMN: Volunteers are lifeblood of conservation authority's work	Innisfil Today	November 1, 2024	
COLUMN: Volunteers are lifeblood of conservation authority's work	Orillia Matters	October 31, 2024	

All other media releases can be found on NVCA website under "News."

3. Other Media Coverage

Title	Media Outlet	Date	Reference
Watershed moment: Officials want to tap into input for resource strategy	Bradford Today	October 13, 2024	Kyra Howes, Director of Conservation Services
Watershed moment: Officials want to tap into input for resource strategy	Collingwood Today	October 13, 2024	Kyra Howes, Director of Conservation Services
COLUMN: Officer walked into the woods in 1825, never to be seen again	Midland Today	October 13, 2024	
Watershed moment: Officials want to tap into input for resource strategy	Orillia Matters	October 13, 2024	Kyra Howes, Director of Conservation Services
COLUMN: Officer walked into the woods in 1825, never to be seen again	Orillia Matters	October 14, 2024	Kyra Howes, Director of Conservation Services
Hurricane Hazel at 70: Areas of Bradford, Innisfil felt storm's wrath	Barrie Today	October 16, 2024	Dalia Al-Ali, Manager of Engineering Services
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Hurricane Hazel at 70: Areas of Bradford, Innisfil felt storm's wrath	Innisfil Today	October 16, 2024	Dalia Al-Ali, Manager of Engineering Services
NVCA dispels anti-development reputation	Creemore Echo	October 18, 2024	Meagan Kieferle, Senior Regulations Officer
WWF-Canada launches 'Mission Restoration' to put nature on a path to recovery in Canada	NationTalk	October 29, 2024	
Help discover how water levels are changing in Cranberry Marsh	Mycollingwood.ca	November 1, 2024	Ian Ockenden, Manager Watershed Science
Text messages helping inform study of Cranberry Marsh water levels	Collingwood Today	November 4, 2024	Ian Ockenden, Manager Watershed Science
Town works on Cranberry Marsh flooding, and urges local homeowners to do the same	Collingwood Today	November 6, 2024	

DISCLAIMER: NVCA does not allege that the information provided in the media articles depicts accurate statements or testimonies on behalf of any individual named, and is not responsible for any misinterpretation of information or misquoted statement(s).

2. Other Communication/Media Outreach

- Ongoing – social media outreach (Facebook, Twitter, Instagram, LinkedIn)

3. Presentations/Displays/Key Events by NVCA staff

- October 11, 2024 – Education team, Rotary Club of Barrie and Georgian Bay Forever delivered Enviroscape and Yellow Fish Road programing to Ardagh Bluffs Public School
- October 19, 2024 – Volunteer tree planting event in Adjala-Tosorontio
- October 19, 2024 – TD Tree Days event on the Ganaraska Trail in Creemore
- October 19, 2024 – Lands team held Haunted Halloween event with Music in Motion at the Tiffin Conservation Area
- October 26, 2024 - Lands team held Haunted Halloween event with Music in Motion at the Fort Willow Conservation Area
- October 26, 2024 – Volunteer tree planting event in Adjala-Tosorontio
- November 1, 2024 – Watershed Science and Communications teams distributed a media release regarding monitoring levels in Cranberry Marsh with the Town of Collingwood

Issues/Analysis

The media coverage and public outreach/communications in this reporting period was positive with regard to NVCA work and programs. There are no issues of concern at this time.

Impact on Authority Finances

Staff time to prepare this report is addressed in the 2024 budget.

Climate Change Implications

This staff report does not result in an increase in green house gases, temperature or precipitation exposure.

Reviewed by:
Original Signed by
Sheryl Flannagan
Director, Corporate Services

Approved for submission by:
Original Signed by
Doug Hevenor
Chief Administrative Officer

Attachment 1 – Media Clippings for the period

Watershed moment: Officials want to tap into input for resource strategy

Natural resources such as wetlands, rivers, streams, forests and groundwater are 'critical to our society, economy and environment,' says agency

October 13, 2024

Bradford Today

1 / 3 Volunteers plant trees along a river's edge.Photo supplied

2 / 3 A Great Egret in the Minesing Wetlands.Photo supplied

3 / 3 Sheldon Creek.Photo supplied

NEWS RELEASE
NOTTAWASAGA VALLEY
CONSERVATION AUTHORITY
****

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The plan also identifies actions to address these concerns. NVCA is conducting public consultation to seek feedback on these risks and mitigation strategies.

The identified risks include development pressure and urban growth, climate change, biodiversity and habitat loss, pressures from agriculture, aging infrastructure, water resources and flooding and erosion.

“The Nottawasaga Watershed contains a mosaic of woodlands, wetlands, valleys and river systems situated amongst agricultural, rural and urban land uses,” said Kyra Howes, director of conservation services. “Since 1960, NVCA has worked with many funders, partners, volunteers, landowners and residents to sustainably manage the Nottawasaga Watershed. We do this

by balancing social, economic, and environmental interests while carrying out our legislative responsibilities."

Natural resources such as wetlands, rivers, streams, forests and groundwater are critical to our society, economy and environment. Not only do these natural resources sustain human lives and benefit our health and well-being, they help to remove air pollution, control flooding, protect us from summer heat, improve our mental and physical health and much more. A healthy watershed is also resilient to climate change and urban growth.

To participate in the public consultation, visit NVCA's website and submit feedback before Nov. 4.

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October 13, 2024

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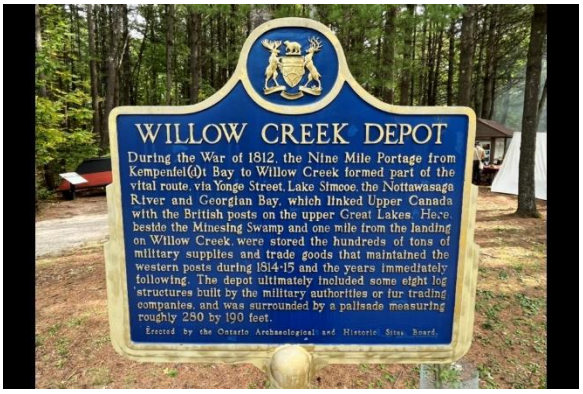

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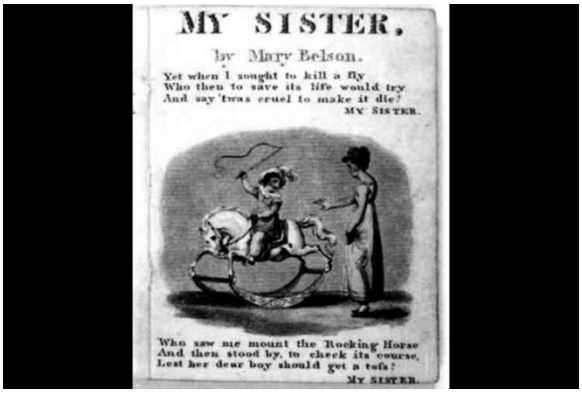

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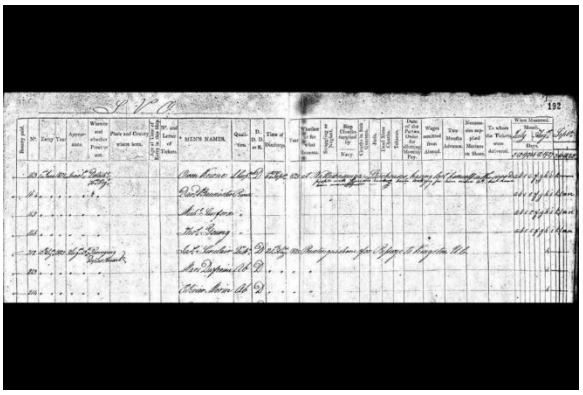

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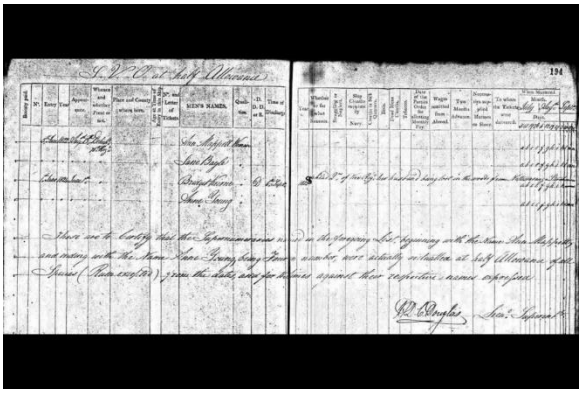

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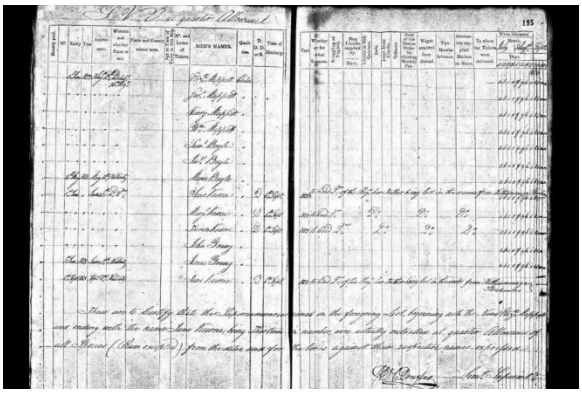

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Since 2005, his Grade 12 archaeology and Canadian history students spend six weeks excavating at Fort Willow Conservation Area, just west of Barrie in Springwater Township, digging up remnants of the past and putting the pieces together to create a better understanding of the history of our area.

During their 2023 dig, Carter and his class unearthed fragments from a children’s plate with blue printed text, which aligned with lines from an 1812 book called *My Sister*, by Mary Benson.

While the plate could have arrived with any number of families that squatted at the site after it was abandoned, printed ceramics like this plate were more often found in wealthier homes, like those of officers.

Archaeological evidence of children at Fort Willow is rare, making this plate fragment an intriguing find. This discovery is made more interesting by its potential link to one of the most enduring mysteries of the site.

On Aug. 6, 1825, Lance Cpl. Owen Keirne walked into the woods near the "Nottawasaga Storehouses," now known as Fort Willow, and was never seen again.

He left behind four daughters, one of which he never met, and his wife, Bridgit Keirne.

Owen Keirne was officially discharged from duty on Sept. 6, 1825, after a month-long search failed to find him. Keirne had been stationed at the rundown depot since June 1, 1824.

Bridget and her four daughters were discharged from the care of the naval base at Penetanguishene; the search continues for any further records about their fate after leaving Penetanguishene.

This is the story as told by the Muster Book from the Naval Base at Penetanguishene.

The circumstances around Keirne's disappearance are mysterious and made all the harder to piece together by time and its effects on people's memory.

In 1890, 65 years after the fact, an aging Rev. Thomas Williams recalled a very similar story from his childhood, but his version features a Cpl. James Cannon, who may or may not have made significant sums of money selling alcohol.

According to the reverend, Cannon's wife had left to give birth at Penetanguishene, so a man named Lawrence was on his way to keep the corporal and his three children company.

On his way, the man heard gunshots in the woods, but thought nothing of them at the time. When Lawrence arrived, however, he found the children alone with no sign of the corporal.

After spending the night with the girls without their father's return, the naval base at Penetanguishene was alerted and a search of the forest was made.

According to the reverend, who was just 14 at the time of the disappearance, speculation of whether the corporal deserted or was killed for the money from his alcohol sales made the rounds.

Muster rolls from the period fail to list any corporals named James Cannon, but the details of Rev. Williams's story do align with the documentation of Owen Keirne's disappearance from that same timeframe.

There is no indication that Keirne had a license to sell alcohol, however. These discrepancies in memory and documented events make putting the stories of the past together

challenging for people who wish to preserve them.

The plate fragment uncovered by Carter’s class provides compelling material support for a family living at Fort Willow around the time of the disappearance.

Considering the corporal’s family had three — soon to be four — daughters, it is deeply symbolic that the blue printed text on the child’s plate fragment was taken from an 1812 children’s book about the kindness of sisters.

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October 13, 2024

Orillia Matters

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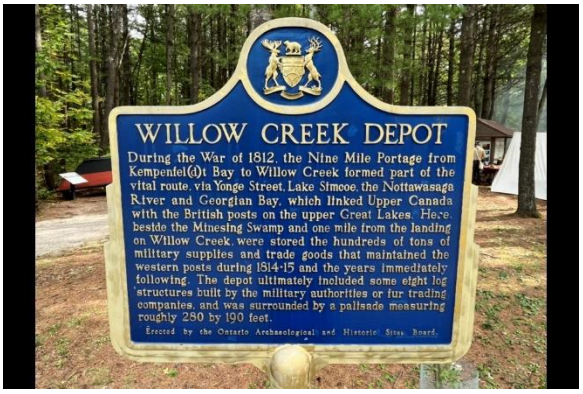

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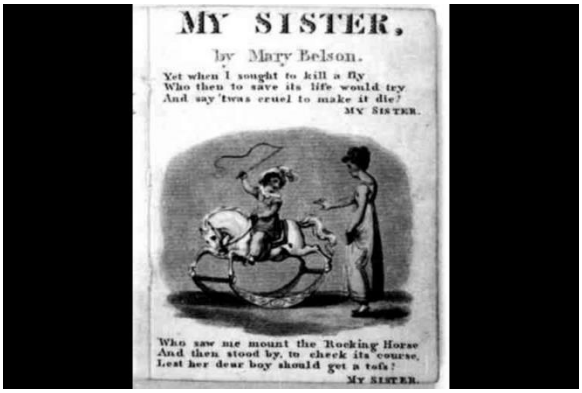

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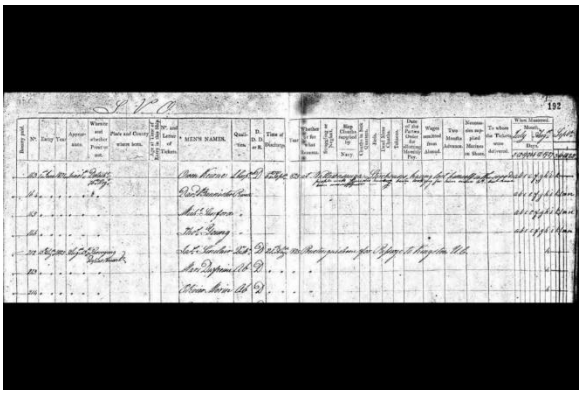

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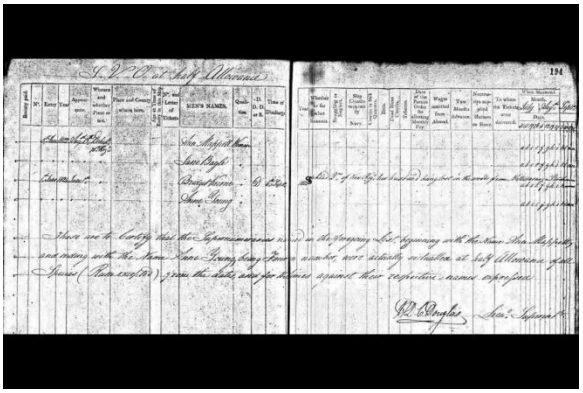

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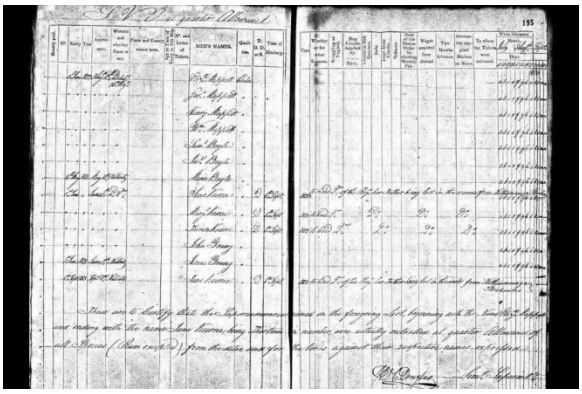

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According to the reverend, who was just 14 at the time of the disappearance, speculation of whether the corporal deserted or was killed for the money from his alcohol sales made the rounds.

Muster rolls from the period fail to list any corporals named James Cannon, but the details of Rev. Williams's story do align with the documentation of Owen Keirne's disappearance from that same timeframe.

There is no indication that Keirne had a license to sell alcohol, however. These discrepancies in memory and documented events make putting the stories of the past together

challenging for people who wish to preserve them.

The plate fragment uncovered by Carter’s class provides compelling material support for a family living at Fort Willow around the time of the disappearance.

Considering the corporal’s family had three — soon to be four — daughters, it is deeply symbolic that the blue printed text on the child’s plate fragment was taken from an 1812 children’s book about the kindness of sisters.

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October 16, 2024 by Michael Owen

Barrie Today

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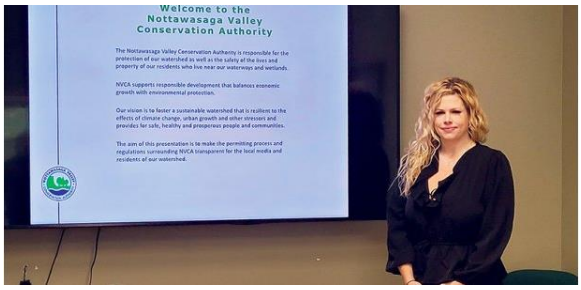
NVCA dispels anti-development reputation

October 18, 2024 by Bonnie MacPherson

Creemore Echo



Of the 398 applications received by the Nottawasaga Valley Conservation Authority (NVCA) last year, all but one were approved, according to Senior Regulations Officer Meagan Kieferle.

During a recent technical briefing on the NVCA's permitting process, Kieferle stressed that the authority's mandate is not to prevent development, but rather to ensure the protection of the watershed and balance economic growth with environmental protection.

"Our vision is to foster a sustainable watershed that is resilient to the effects of climate change, urban growth and other stressors and provides for safe, healthy and prosperous people and communities," said Kieferle. "Ultimately, we aim to prevent injury and loss of life, reduce risks to property and infrastructure, and protect the natural benefits offered by wetlands, watercourses and shorelines."

The NVCA is responsible for the entire Nottawasaga Watershed, a portion of which is situated within the jurisdiction of its 18 member municipalities. Property owners require an NVCA permit for construction of a dwelling or an addition, building things like shorewalls, in-ground pools, retaining walls and septic tanks, construction of accessory buildings greater than 150 square metres in area, and grading or other site alteration. Permits are not required for projects like fences and ground level decks outside natural hazards, and above ground pools. Where there is any doubt, Kierferle encourages property owners to visit the NVCA office in Utopia for a pre-consultation.

"The easiest way is to just walk into our office and say 'this is what I'd like to do'. Our staff will point out any potential problems with obtaining a permit, and may be able to suggest small changes that will make the project compliant," she said. "For moreinvolved consultations, an appointment is recommended, and there is a fee."

Applications that have gone through a pre-consultation tend to be approved more quickly, according to Kieferle. Minor applications may be green lighted in as little as a day or two if no technical review is needed. Once the application is completed, provincial guidelines suggest that a decision should be rendered within 90 days. Kieferle says since last April, the NVCA has been 100 per centsuccessful in meeting that standard. The most common reason for delays are incomplete applications, with missing information such as accurate measurements or drawings.

Fines for proceeding without necessary permits can be up to $50,000 plus additional review fees and costly delays.

To determine whether your property is in a protected area, check the interactive map at www.nvca.on.ca/planning-permits/find-your-property.

WWF-Canada launches 'Mission Restoration' to put nature on a path to recovery in Canada

October 29, 2024

NationTalk

OCTOBER 29, 2024, Cali, Colombia—WWF-Canada launched "Mission Restoration" at the UN Convention on Biological Diversity's Conference of the Parties (COP16) today — a collaborative initiative toward helping to reach Canada's restoration goals under the Kunming-Montreal Global Biodiversity Framework (GBF).

Mission Restoration aims to bring together organizations that are committed to restoring essential ecosystems, providing valuable insights into how restoration actions are adding up throughout Canada, inspiring others to join the effort to bring nature back and helping to raise awareness of the benefits to nature, communities and climate that restoration brings.

To ensure we are working effectively together, we are today inviting large land and rightsholders in Canada, including Indigenous communities, non-profit organizations, governments at all levels and businesses that are investing in broad-scale ecosystem restoration, to join us. Together, we will build awareness of the important role of restoration in fighting biodiversity loss and climate change; track our progress; share knowledge and best practices; inspire investments for restoration from governments, businesses and donors; and increase the momentum of efforts to meet our international commitments.

Restoration, the process of supporting the recovery of ecosystems that have been converted or degraded because of human activities, can include a wide range of actions such as rebuilding salmon spawning channels, reforesting to fire-damaged landscapes or repairing the banks of flood-ravaged rivers. Target 2 of the GBF states that "by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and marine and coastal ecosystems are under effective restoration, in order to enhance biodiversity and ecosystem functions and services, ecological integrity and connectivity."

Since 2020, WWF-Canada — in partnership with groups such as the Secwepemcúl'ecw Restoration and Stewardship Society, Katzie First Nation, ALUS, and the Nottawasaga Valley Conservation Authority—has more than 80,000 hectares restored or in progress. Our goal is to restore one million hectares by 2030, but to reach this number and to help put Canada on a path towards achieving its GBF commitments, we are looking to build a coalition of organizations engaged in this work.

Currently, organizations, government agencies, and lands and rightsholders who are conducting restoration efforts are acting largely on their own, without an understanding of how their work contributes to collective results and therefore national commitments. Mission Restoration invites them to join forces to help build awareness and enhance the recognition of restoration of areas that are five

hectares or larger and are already underway.

Quotes

"Canada has committed to restoration through various international agreements, including the GBF, Global Freshwater Challenge and the Bonn Challenge. Achieving restoration at this scale will require all our combined efforts, which is why we're supportive of WWF-Canada's Mission Restoration. It will allow organizations doing large-scale complex ecosystem restoration to document and report their activities, ensuring the work contributes to Canada's restoration goals," says Steven Guilbeault, Minister of Environment and Climate Change Canada

"WWF-Canada has been working hard toward our goal to Regenerate Canada by 2030, including restoring 1 million hectares of lost habitat. Mission Restoration is an exciting new venture that will not only help us to reach this goal, but also contribute to our national and international targets. We look forward to working with others who are doing the same," says Megan Leslie, WWF-Canada president and CEO

"Conservation Ontario (CO) is excited to see WWF-Canada bringing restoration practitioners around the country together to help all of us reach our individual and national goals. For over 75 years Conservation Ontario and our 36-member Conservation Authority network have successfully collaborated with municipalities, residents and other partners in restoration to support biodiversity, flood risk reduction and build watershed resilience. This collaboration is an effective way to work together and make sure restoration in Canada counts," says Angela Coleman, General Manager, Conservation Ontario

"Each and every one of us can make a difference. If we all work together hopefully, we can bring the salmon back, maybe not to historical levels but to levels where our children and grandchildren in generations to come will still be able to have salmon to eat," says Rick Bailey, Katzie First Nation councillor

About Mission Restoration

The restoration of damaged ecosystems in Canada is critical to reversing the loss of biodiversity, supporting the rights and priorities of First Nations, Inuit and Métis, and maximizing ecosystem carbon sequestration to fight climate change.

Canada's natural ecosystems are incredibly diverse, but they're under pressure from human activities such as resource development, urban growth, pollution and changes in land use. On top of that, natural events such as wildfires, floods, drought, as well as climate change and invasive species are exacerbating the loss of nature. All these factors have combined to destroy or fragment habitats, disrupting the important benefits that ecosystems provide.

Restoration is an important tool in the effort to halt and reverse biodiversity loss.

It also improves degraded areas and brings back ecosystem benefits, supporting wildlife and contributing to climate change mitigation and adaptation. Putting nature on the path to recovery can also enable Indigenous conservation leadership, improve livelihoods and help build a sustainable economy.

Mission Restoration will:

- track and count current restoration initiatives
- galvanize organizations to undertake new complex ecosystem restoration projects
- inspire investments around national and international restoration commitments, and
- raise awareness of the benefits of restoration for nature and climate.

About World Wildlife Fund Canada
WWF-Canada is committed to equitable and effective conservation actions that restore nature, reverse wildlife loss and fight climate change. We draw on scientific analysis and Indigenous guidance to ensure all our efforts connect to a single goal: a future where wildlife, nature and people thrive. For more information visit wwf.ca.

For more information, contact:

Tina Knezevic, senior communications specialist, WWF-Canada, tknezevic@wwcanada.org

COLUMN: Volunteers are lifeblood of conservation authority's work

Nottawasaga Valley Conservation Authority thankful for 'long-lasting and positive effect' volunteers have on watershed

October 31, 2024

Collingwood Today

1 / 4 Volunteers gather together for orientation before planting trees in Creemore.Photo supplied by the Nottawasaga Valley Conservation Authority

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November 1, 2024

Bradford Today

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November 1, 2024

Collingwood Today

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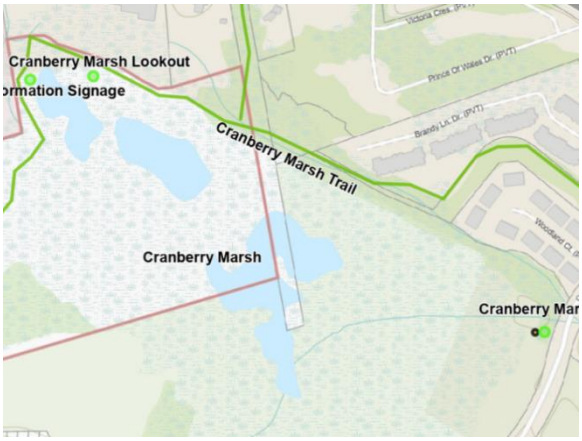
Help discover how water levels are changing in Cranberry Marsh

Mycollingwood.ca

November 1, 2024



The Town of Collingwood and Nottawasaga Valley Conservation Authority (NVCA) have initiated a water level study in Cranberry Marsh and the community is invited to participate.

NVCA has placed a community monitoring station at the lookout along the Cranberry Marsh boardwalk. Residents can help the study by submitting water level observations and photographs taken at the community monitoring station to the NVCA.

To submit observations, residents are invited to record the water level on the ruler at the station along with the date and time. Next, take a photo of the ruler showing the water level and text all this information, including the photo, to 705-717-8694. More detailed instructions can be viewed on the signage onsite.

"The community monitoring station was installed in August, and we will be collecting data for one year," said Ian Ockenden, Manager of Watershed Science at NVCA. "This year-long project will tell us what is happening in the wetland. Wetland water levels fluctuate naturally, and we need to determine if these water levels are changing beyond what would be expected in a natural system."

To learn more about how water levels fluctuate in wetlands, visit NVCA's website at nvca.on.ca.

Findings from the Cranberry Marsh study will be reported back to Collingwood Council following the year-long study.

COLUMN: Volunteers are lifeblood of conservation authority's work

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October 31, 2024

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Maria Leung is the senior communications specialist with the Nottawasaga Valley Conservation Authority.

Text messages helping inform study of Cranberry Marsh water levels

Those who visit the lookout on the boardwalk in the marsh can help by sending a photo of the water level to the conservation authority

November 4, 2024

Collingwood Today

The monitoring station at Cranberry Marsh encourages residents to help submit data for the water level study. Contributed photo

Residents and anyone else using the Cranberry Marsh trail are invited to help gather scientific data to inform a water level study at the marsh.

The Town of Collingwood and the Nottawasaga Valley Conservation Authority (NVCA) have started a water study for the Cranberry Marsh, and as part of the study, have installed a monitoring station at the lookout on the boardwalk trail.

Residents who go by the monitoring station are invited to record their observations. There's a ruler mounted on the boardwalk to measure water level. Those wishing to record a measurement can take a photo of the ruler at the station, record the measurement, date, and time, and text all the information with the photo to 705-717-8694.

There's a sign at the site with detailed instructions.

“The community monitoring station was installed in August, and we will be collecting data for one year,” said Ian Ockenden, the manager of watershed science at NVCA in a news release from the conservation authority and the town. “This year-long project will tell us what is happening in the wetland. Wetland water levels fluctuate naturally, and we need to determine if these water levels are changing beyond what would be expected in a natural system.”

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Findings from the Cranberry Marsh study will be reported back to Collingwood council following the year-long study.

Root cause: Volunteers plant trees, shrubs near Barrie's Little Lake Park

Community plantings also held along Ganaraska Trail in Creemore and at Whitetail Refuge Nature Reserve in Mono Centre

Barrie Today

November 6, 2024

1 / 3 Volunteers at the TD Tree Days event in Barrie.Photo supplied

2 / 3 Group photo of all volunteers who attended TD Tree Days.Photo supplied

3 / 3 Volunteers worked together to plant this tree.Photo supplied

NEWS RELEASE
TD TREE DAYS
****

UTOPIA – The Nottawasaga River watershed has an additional 800 native trees and shrubs thanks to TD Tree Days and the 130 volunteers who planted them at three community planting events held this fall.

On Sept. 7, 45 volunteers from TD and NVCA planted 150 trees and shrubs near Little Lake Park in Barrie.

Two weeks later, on Sept. 21 at the Whitetail Refuge Nature Reserve in Mono Centre, NVCA hosted another TD Tree Days event where 50 volunteers came out to help put 400 trees and shrubs in the ground.

And on Oct. 19, another 40 volunteers came together to plant 275 trees along the Ganaraska Trail in Creemore.

"This much-needed restoration was made possible with the help of the volunteers and the support of TD Tree Days," said Sarah Campbell of the Nottawasaga Valley Conservation Authority (NVCA), who organized the planting events. "These events are a

great way of engaging our local community in the restoration of natural habitats in our watershed."

The newly planted 800 trees and shrubs will create wildlife habitat, provide shade which will help to cool water temperatures, and will naturalize the landscape. The trees also act as a buffer to filter excess nutrients and pollutants before rain or snowmelt reaches our rivers, streams and wetlands.

TD Tree Days provides TD employees an opportunity to demonstrate environmental leadership in their local communities. Since TD Tree Days launched in 2010, over 520,000 trees have been planted nationwide. This year, volunteers will help plant 30,000 more at various events hosted across Canada and around the world.

"We were excited to continue working with TD Tree Days this year and look forward to working with them in 2025," added Campbell.

The NVCA is booking now for 2025 tree planting and stewardship projects.

Landowners that are interested in planting trees and shrubs along streams or wetlands on their property can contact NVCA at 705-424-1479 to arrange a site visit and learn about available funding.

Volunteers interested in tree planting and other environmental projects should visit www.nvca.on.ca to learn more.

Town works on Cranberry Marsh flooding, and urges local homeowners to do the same

'I think that generally, it's not understood what the obligations are and what the liability is for those landowners if they're not doing what they should to maintain those stormwater works,' says Collingwood mayor

November 6, 2024 by Jessica Owen

Collingwood Today

The Nottawasaga Valley Conservation Authority has placed a community monitoring station near Pretty River Academy next to the Cranberry Marsh boardwalk. Residents can submit water level observations and photographs taken at the station.Contributed image

The Town of Collingwood has made strides toward improving the water levels in the Cranberry Marsh, however they say some of the blame for water levels increasing is private landowners not understanding their responsibilities and the town having little recourse to solve drainage issues on private land.

During their council meeting on Nov. 4, councillors received a memo from public works, engineering and environment director Peggy Slama and project engineer Stuart West on work done to date on improving drainage in the marsh after it was brought to the attention of the town earlier this year.

"I would like to congratulate staff for a relatively quick follow-up on this very valid complaint from residents and the improvements that have been seen already," said Coun. Deb Doherty. "This marsh is critical to be functioning in the best manner possible to absorb run-off."

Back in March, Heather McCleary and Nick Best presented council with their experiences living so close to the Cranberry Marsh, and the kinds of flooding they had seen.

Council chambers that night were packed with other residents with the same experiences.

In April, council voted unanimously in favour of having staff identify remedial steps that could be taken to reduce flooding in the marsh, and to direct staff to get all stakeholders together to discuss long-term solutions.

The town has reported that the marsh and creek watershed is two feet higher than the average level over the past 10 years, and the current level threatens the boardwalk and trees bordering the marsh.

Since then, town staff told council this week that they had completed ditching work on the Cranberry Creek from Cranberry Trail East to Dawson Drive.

A beaver dam was removed by a licensed trapper within the marsh, and anecdotally, staff are reporting the water levels receded after this work was completed.

"Staff will continue to monitor for beaver activities and damming, which is a natural process, and will respond accordingly when needed," wrote Slama in the memo to councillors.

Staff have also expanded the scope of their Stormwater Master Plan work to include modelling within the Cranberry Marsh. They've also committed to working with the Nottawasaga Valley Conservation Authority on long-term monitoring of water levels in the marsh.

The NVCA has placed a community monitoring station near Pretty River Academy next to the Cranberry Marsh boardwalk.

Residents can help the study by submitting water level observations and photographs taken at the community monitoring station to the NVCA.

However, as part of the memo, Slama noted that the town can only do work on the land they own, noting that there are fallen trees in Cranberry Creek on private land.

"Private landowners are responsible for the maintenance of a watercourse through their lands," she said. "There are no regulatory tools in place for the town to control the state of watercourse through private lands nor does the town have any authority to enter, maintain, or remove trees."

Slama said that staff can only write to landowners to bring their obligations to maintain watercourses to their attention, and outline the potential risks if they don't do so. She noted that dead trees within the marsh are not necessarily a result of high water levels.

"The emerald ash borer is an invasive species that is particularly harmful to Ash trees across the province," she said. "There is also no indication if some of the trees were at their end of life."

During council discussion, Mayor Yvonne Hamlin said she was in favour of having the town reach out to private landowners whose homes sit on the marsh.

"I think that generally, it's not understood what the obligations are and what the liability is for those landowners if they're not doing what they should to maintain those stormwater works," she said. "They should have all this information so they can think about whether they want the town to take this over."

Hamlin said she's had many meetings with condominium owners in the Cranberry Marsh area over the past few years.

"I think there is real confusion over what their responsibilities are; where their responsibility ends and the town's starts," she said. "I think the more information we can give, the better."

She noted that the issue is a prime example of how dangerous is can be when private landowners are

responsible to manage stormwater that affects other landowners.

“I can see future headaches all around,” said Hamlin.