WATERSHED-BASED RESOURCE MANAGEMENT STRATEGY

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October 18, 2024

Niagara Peninsula
CONSERVATION
nature for all

getinvolved.npca.ca/watershed-strategy

Land Acknowledgement

The Niagara Peninsula watershed is situated within the traditional territory of the Haudenosaunee, Attiwonderonk (Neutral), and the Anishinaabeg, including the Mississaugas of the Credit—many of whom continue to live and work here today.

The territory is covered by the Upper Canada Treaties (No. 3,4, and 381) and is within the land protected by the Dish with One Spoon Wampum agreement. Today, the watershed is home to many First Nations peoples, Métis citizens, and Inuit.

Through this Watershed Strategy, the NPCA reconfirms its commitment to shared stewardship of natural resources and a deep appreciation of Indigenous culture and history in the watershed.

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1.0 INTRODUCTION

1.1 About Niagara Peninsula Conservation Authority

The Niagara Peninsula Conservation Authority (NPCA) is a community-based natural resource management agency that protects, enhances, and sustains healthy watersheds that was established in 1959 pursuant to the *CA Act*. With 65 years of experience, NPCA offers watershed programs and services that focus on flood and hazard management, source water protection, species protection, ecosystem restoration, community stewardship, and land management.

A watershed is the land that drains into a particular watercourse such as a stream, river, lake. Gravity and the land's topography (the high and low areas) move water, rain, and snowmelt across the landscape from one area to another. Figure 1 below provides a simple illustration showing the different elements within a watershed.

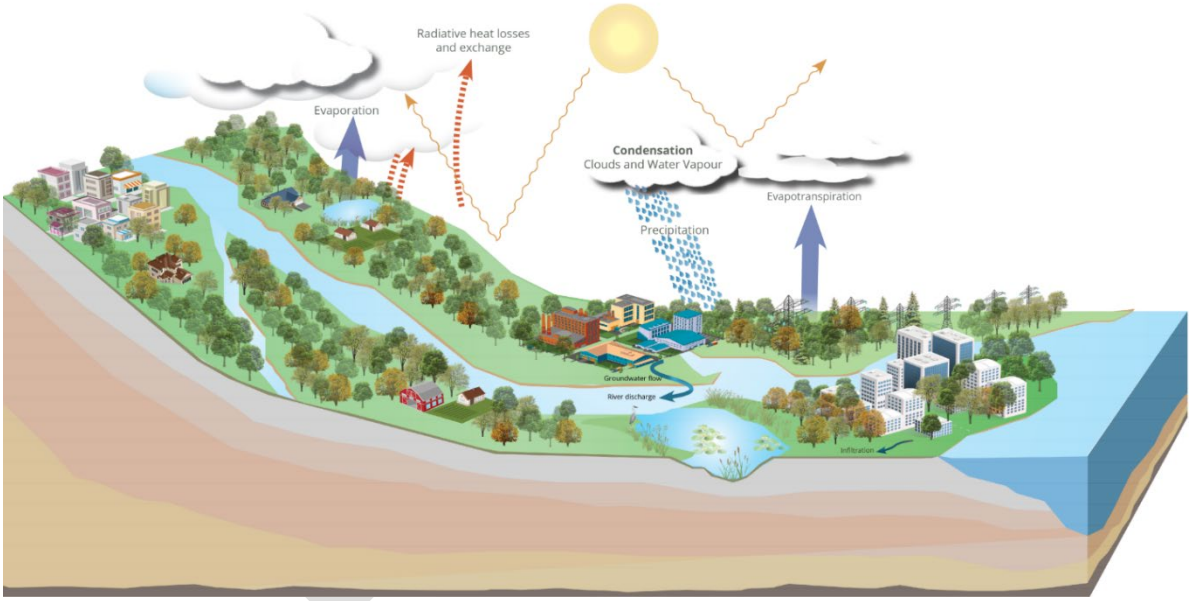

Figure 1 – Watershed Diagram

NPCA's watershed area encompasses 2,424 km2, and includes the regional municipality of Niagara, portions of the City of Hamilton (21%), and Haldimand County (25%). Since time immemorial, this area has been the home to Indigenous peoples—a place for sharing, trading, hunting, gathering, stewardship, and friendship. Currently, the watershed supports a population of approximately 520,000 people. Figure 2 shows the limits of the Niagara Peninsula watershed.

Figure 2 – NPCA Watershed

The watershed is uniquely situated between two Great Lakes, with the Niagara River as a boundary shared with the United States of America. As a result, the watershed area includes several notable natural features such as the Niagara Escarpment Biosphere Reserve, the Niagara Falls, Wainfleet Bog, Ball's Falls, Willoughby Marsh, and other significant landforms such as the Fonthill Kame ice contact-delta complex. The unique microclimate created by the Niagara Escarpment and rich soils supports one of Ontario's most productive agriculture systems, including vineyards, tender fruit orchards, livestock, and various specialty crops (greenhouses for flowers, vegetables, sod farms, and mushroom farms). These important watershed features provide life-sustaining benefits for all and many opportunities to discover nature and culture.

1.2 Watershed Characterization

1.2.1 Topography

The Niagara Peninsula watershed is a unique geographic region situated between Lake Ontario to the north, Lake Erie to the south and the Niagara River forming the eastern boundary, flowing from Lake Erie to Lake Ontario. The topography is defined by rolling hills, flat lands toward the lake shores and the dramatic Niagara Escarpment, the most prominent feature, which extends east-west across the peninsula. The escarpment creates cliffs and ridges, most famously forming the backdrop for Niagara Falls where the Niagara River plunges over the edge of the escarpment.

1.2.2 Physiography

The Niagara Peninsula watershed contains several key physiographic areas, including the Iroquois Plain, Haldimand Clay Plain and the aforementioned Niagara Escarpment.

The Iroquois Plain is located between the Niagara Escarpment and Lake Ontario, and consists of lacustrine deposits of sand, silt, and clay associated with the glacial Lake Iroquois. The Iroquois Plain deposits overlie Halton Till.

The Niagara Escarpment contains a relatively hard dolostone bedrock cap, which is underlain by softer shales and sandstones of the Clinton, Cataract and Queenston bedrock groups. The escarpment was formed by erosion of the softer bedrock materials below the dolostone cap.

The relatively flat lands of the Haldimand Clay Plain extend from the Niagara Escarpment to Lake Erie. The Haldimand Clay Plain was submerged by glacial Lake Warren and much of it is covered by lacustrine clay deposits. Key physiographic features located in the Haldimand Clay Plain include the Dunnville Sand Plain, Onondaga Escarpment, Fonthill Kame-Delta Complex, and several moraines.

The Dunnville Sand Plain is a flat, sandy area formed by glacial outwash located in the southwestern region of the peninsula and is characterized by well-drained, sandy soils. The terrain is relatively flat, with few elevation changes, and its porous soil helps with groundwater recharge.

The east-west trending Onondaga Escarpment is of relatively low topographical relief just north of Lake Erie and rises only a few meters above the surrounding lands. Overburden soils overlie portions of the Onondaga Escarpment near NPCA's western boundary.

The steep-sided Fonthill Kame-Delta Complex was formed when sediment was deposited by melting glaciers, leaving behind a prominent hill that rises roughly 80 metres above the surrounding land and

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covers an area approximately 6 kilometres in diameter. Groundwater from the Fonthill Kame-Delta Complex discharges to the north into Twelve Mile Creek, to produce the only cold-water stream and cold-water fish habitat in the Niagara Peninsula watershed.

Other landforms and physiographic features found within the watershed include moraines, eskers, and drumlins.

1.2.3 Geology and Groundwater System

The Niagara Peninsula watershed is unique with respect to an abundance of water resource availability being situated between two Great Lakes, having two bedrock escarpments and three overburden deposits. All the municipal drinking water within NPCA's jurisdiction is derived from surface water sources with groundwater mainly making up rural agricultural, commercial and private residential uses.

When it comes to groundwater in the Niagara Peninsula watershed, there are four main aquifer types that are typically drawn from, these include the surficial overburden, the Guelph/Lockport formations, the Onondaga/Bois Blanc formations, and the "Contact-Zone" aquifer.

The surficial overburden aquifers consist of coarse-grained deposits of sediments classified as unconfined aquifers and are known as the Fonthill Kame-Delta Complex, the Dunnville Sand Plain and the Iroquois Sand Plain.

The Guelph/Lockport formations refer to the bedrock formations consisting mainly of dolostone with some limestone that form the prominent features of the Niagara Escarpment, running the width of the northern portion of the Niagara Peninsula. These formations can be heavily fractured/weathered and can be considered unconfined/confined depending on the abundance of overlying material.

The Onondaga/Bois Blanc formations refer to the bedrock formations consisting mainly of dolostone and limestone that form the prominent features of the Onondaga Escarpment, running the width of the southern portion of the Niagara Peninsula. These formations can also be heavily fractured/weathered and can be considered unconfined/confined depending on the abundance of overlying material.

The "Contact-Zone" aquifer is an overburden/bedrock aquifer that covers over 60 per cent of the NPCA jurisdiction. The term "Contact-Zone" refers to the bedrock-overburden contact where granular overburden material is overlying fractured bedrock. This aquifer is usually overlain by thick deposits of clay from the Haldimand Clay Plain and is generally considered confined.

With respect to groundwater movement across the NPCA, generally groundwater movement is from the west to the east interior and then to either of the Great Lakes, the Niagara River or the Welland River, with

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localized areas of groundwater discharge along the escarpments and wetlands. There is also large-scale permanent dewatering activities associated with the Welland Canal tunnels that have an impact on the movement of groundwater within the NPCA.

1.2.4 Surface Water System

Nearly 5,000 km of watercourses in NPCA's watershed jurisdiction encompasses a rich variety of surface water features that are part of three major drainage basins: Lake Ontario, Lake Erie, and the Niagara River. Numerous streams, rivers, and creeks, such as 12 Mile Creek and 20 Mile Creek, flow into Lake Ontario, while the Welland River and other tributaries drain into the Niagara River, a critical waterway connecting the two Great Lakes. The Lake Erie basin includes the southern portion of the watershed, with its own network of smaller streams and wetlands. These surface water features, including significant wetlands, play a key role in maintaining and supporting biodiversity, mitigating flooding, and providing water resources for both human use and natural habitats. Together, these interconnected water systems form the hydrological foundation of the NPCA's jurisdiction.

1.2.5 Natural Heritage System

The Niagara Peninsula is located within the northern most range of the deciduous forest region in North America, also referred to as the Carolinian Life Zone. It has the warmest average annual temperatures, the longest frost-free growing season and the mildest winters in Canada. This zone represents 1% of Canada's land area and it has more species of plants and animals than any other ecosystem in Canada (Carolinian Canada website).

The Niagara Peninsula watershed includes nearly 68,000 hectares of natural features such as wetlands, forests and meadows covering almost 30% of its land base, providing habitats for over 2,200 species of plants and animals highlighting its ecological diversity; unfortunately, nearly 10% of these species are considered to be rare or at risk due to habitat loss, urban sprawl, invasive species competition, pollution, and climate change.

The Niagara Escarpment, a UNESCO World Biosphere Reserve, features dramatic cliffs, forests, and rare species while offering stunning views and geological formations. The Niagara Glen Nature Reserve along the Niagara River is a lush, forested area with deep ravines, limestone outcrops, and unique Carolinian forests.

Other key areas include the Wainfleet Bog, one of the largest remaining bogs in southern Ontario, and Short Hills Provincial Park, which preserves forested valleys and rolling hills. These areas are vital for supporting conservation efforts while providing habitats for species at risk and offering recreational

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opportunities like hiking and wildlife observation, enhancing Niagara's appeal as a destination for nature enthusiasts.

1.2.6 NPCA Conservation Area System

NPCA owns nearly 3,000 hectares of land within our watershed across forty-one (41) conservation areas held in public trust for recreation, heritage preservation, conservation, and education. These areas represent a wide range of ecosystem types and protect some of the most significant ecological features in the watershed. NPCA stewards important sections of shoreline along Lake Erie and Lake Ontario, migratory bird habitat, provincially significant wetlands (PSW), Areas of Natural and Scientific Interest (ANSI), important cultural heritage sites, and large sections of the Niagara Escarpment, a UNESCO Biosphere Reserve. Together these conservation areas represent an essential part of the natural treasures and significant ecosystems in the Carolinian Life Zone. In southern Ontario, and especially in the Niagara Peninsula watershed, growing pressures on the landscape are due to increased urbanization, land use changes, and changing climatic conditions. In addition, there is a well-documented increasing demand for access to greenspace for the health and well-being of the growing population. NPCA conservation areas support and enhance local communities, agriculture, recreation, health, tourism, and natural heritage, and are indispensable outdoor recreation areas for over half a million people in the watershed, and our visitors.

1.2.7 Climate

The climate of the Niagara Peninsula is influenced heavily by its proximity to Lake Ontario and Lake Erie, resulting in a moderate humid continental climate. The lakes act as natural temperature buffers, making winters milder and summers cooler than more inland regions creating a longer growing season, crucial for the region's renowned vineyards and orchards. Precipitation is evenly distributed throughout the year, with moderate rainfall and occasional lake-effect snow in the winter. The Niagara Escarpment and the Great Lakes contribute to microclimates that vary across the peninsula, supporting diverse agricultural activities, including the production of tender fruits and wine.

The Niagara peninsula is projected to experience significant warming over the next 30 years, with average air temperatures rising by 2°C. Winter and fall will see the largest increases in daily mean temperatures (2.4°C and 2.2°C), while summer and spring will rise by 2°C and 1.6°C respectively. Winter minimum temperatures are expected to rise from -7.1°C to around -5°C, reducing the number of days below 0°C from 125 to 105.7 days annually. Warmer winters will likely shift precipitation from snow to rain, increasing flood risks and impacting winter tourism.

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Heat-related impacts are also expected, with the number of days above 30°C projected to more than double from 10.4 to 23.9 days annually. Days exceeding 25°C will increase by 24.2, and tropical nights (minimum temperatures above 20°C) will rise dramatically from 9.4 to 46.2 days, increasing cooling demands. Conversely, extreme cold days (below -20°C and -15°C) will decrease.

Total annual precipitation is projected to rise by 5%, with the largest seasonal increases in winter and spring. Extreme precipitation events, such as heavy one-day rainfall, are also expected to increase. However, there is variability in model projections, highlighting the need for adaptive strategies. Freeze-thaw cycles will decrease, reflecting milder winters, while dry conditions remain stable.

The growing season is expected to lengthen by eight days on average, due to earlier growing season start days and later end dates, though temperature fluctuations may affect crop hardiness. Warmer conditions will support both plant growth and the lifecycle of pests.

1.2.8 Land Use

Land use on the Niagara Peninsula watershed is diverse, shaped by its fertile soils, unique microclimate, its proximity to the Great Lakes, and its strategic position as an industrial centre and border region, leads to the demands of competing land uses. The Welland Canal, which connects Lake Ontario and Lake Erie, is a major infrastructure feature in the watershed, facilitating shipping and influencing land use along its route.

The combination of climate, physiography, soils and location make the area one of the most productive agricultural areas in Canada. The physical distinctiveness of the region is what has enabled a unique agricultural industry to develop. The wine industry is particularly prominent, with many vineyards and wineries scattered throughout the watershed.

Urban development on the Niagara Peninsula is ongoing with key cities such as City of Hamilton, St. Catharines, Niagara Falls, and Welland, where residential, commercial, and industrial growth is ongoing. These urban centers have expanded significantly due to their strategic location near the U.S. border, the Great Lakes, and major transportation routes like the Queen Elizabeth Way (QEW) highway and the Welland Canal. Smaller, but substantially growing urban areas of Binbrook, Smithville, Grimsby, Thorold, Port Colborne, Fort Erie and Niagara-on-the-Lake residential, commercial, and industrial developments continue to expand. Suburban expansion is also growing as population increases and demands for housing rise.

Efforts to balance agricultural productivity, urban growth, and environmental protection are key in managing land use within the Niagara Peninsula watershed. This balance is critical to protecting water

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resources, preserving biodiversity, and ensuring the long-term sustainability of the region's terrestrial and aquatic systems.

1.3 Integrated Watershed Management

The NPCA has adopted an Integrated Watershed Management (IWM) approach to watershed planning. The IWM approach recognizes that water is a valuable resource which should be managed in a sustainable manner in perspective with the balance of natural resources (fisheries, wildlife and lands).

IWM is the process of managing human activities and natural resources in an area defined by watershed boundaries. It is an evolving and continuous process through which decisions are made for the sustainable use, development, restoration and protection of ecosystem features, functions and linkages. IWM serves to assess watershed functions and the potential impacts from change to ensure sustainability. Through adaptive management practices the watershed unit provides ideal context with which we can understand how impacts are felt and how they can accumulate.

For the NPCA, this means adopting the IWM lens when carrying out its programs and services. IWM helps us to focus on priorities and link strategies and actions leading to smarter, science-based decisions that ensure a long and healthy future.

1.4 Purpose and Regulatory Framework

1.4.1 Purpose of the Watershed Strategy

The purpose of the Watershed Strategy is to assist NPCA with evolving or enhancing the delivery of our programs and services and improve efficiency and their effectiveness in supporting mandatory Category 1 programs.

Figure 3 illustrates the framework that has been utilized for developing the Watershed Strategy. As part of this Strategy, the NPCA will integrate guiding principles and objectives from the 10-year Strategic Plan that inform the design of our programs and services, summarize information the NPCA relies on to directly inform and support program and service delivery, and identify any issues and risks which may limit effective delivery of Category 1 programs and services, including actions to address such risks. It provides a mechanism to update the NPCA's programs and services inventory and will help identify where opportunities exist for improving and/or maintaining watershed health.

The NPCA's Watershed Strategy has been developed in accordance with the NPCA's Inventory of Programs and Services for consistent language/program descriptions.

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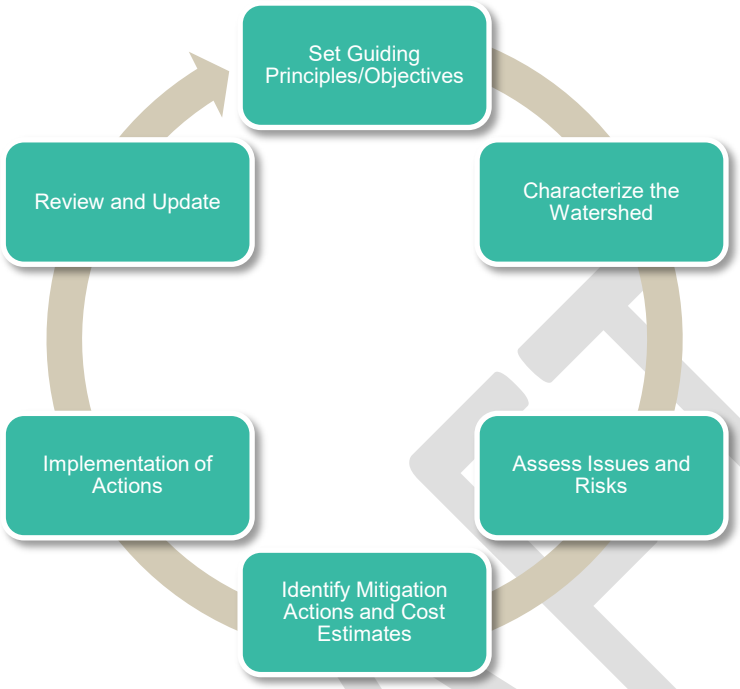

Figure 3 – Watershed-based Resource Management Strategy Framework

1.4.2 Legislative Context

Ontario Regulation. (O. Reg.) 686/21: Mandatory Programs and Services, is a regulation made under s. 21.1(1)2 of the Conservation Authorities Act that prescribes programs and services that a Conservation Authority must provide within its area of jurisdiction.

Conservation Authorities are required to prepare an Inventory of Programs and Services to identify:

- **Category 1:** Mandatory Programs and Services, such as natural hazard management;
- **Category 2:** Municipal Programs and Services at the request of a Municipality, such as tree planting services, and technical research to help inform decision-making; and
- **Category 3:** Other Programs and Services determined by the Conservation Authority to further the purposes of the *Conservation Authorities Act*, such as restoration and stewardship, and watershed monitoring.

NPCA's programs and services are funded either through municipal levies, municipal cost apportionments requiring agreements for service, service fees, or external funding such as grants.

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Table 1: Conservation Authorities Act Funding Mechanisms for NPCA's Programs and Services

Category 1 Mandatory Programs and Services (O.Reg.686/21)	Category 2 Municipal Programs and Services	Category 3 Other Programs and Services
• Programs and services which all CAs must provide in their jurisdiction • Eligible for costs to be apportioned to participating municipalities (levy) without an agreement • Funded through municipal levy, user fees, and/or grants	• Programs and services which a CAs agrees to provide on behalf of municipality • Eligible for costs to be apportioned to participating municipalities if there is an MOU or other agreement • Funded through municipal levy, user fees, and/or grants; MOU/service agreement	• Programs and services which a CA determines are advisable to further the purpose of the Act • Eligible to be apportioned wholly or partially to municipalities through a cost apportioning agreement • Funded through municipal levy, user fees, and/or grants; MOU/service agreement required for use of municipal funding

O. Reg. 686/21: Mandatory Programs and Services also requires Conservation Authorities to prepare a "Watershed-based Resource Management Strategy".

The Watershed-based Resource Management Strategy must include the following components:

- Guiding principles and objectives that inform the design and delivery of the programs and services that the Conservation Authority is required to provide under section 21.1 of the Conservation Authorities Act (i.e. mandatory programs and services).
- A summary of existing technical studies, monitoring programs and other information on the natural resources the Authority relies on within its area of jurisdiction or in specific watersheds that directly informs and supports the delivery of programs and services under section 21.1 of the Act.
- A review of the Authority's programs and services provided under section 21.1 of the Act for the purposes of:

- Determining if the programs and services comply with the regulations made under clause 40 (1) (b) of the Act (e.g. mandatory programs and services, and review of applications under prescribed Acts);
- Identifying and analyzing issues and risks that limit the effectiveness of the delivery of these programs and services; and
- Identifying actions to address the issues and mitigate the risks identified by the review and providing a cost estimate for the implementation of those actions.

- A process for the periodic review and updating of the Watershed-based Resource Management Strategy by the Authority that includes procedures to ensure stakeholders, and the public are consulted during the review and update process.

2.0 STRATEGIC DIRECTION

2.1 NPCA Strategic Plan: Nature for All

The 2021-2031 NPCA Strategic Plan: Nature for All, is a guiding document that reaffirms our commitment to the mandate of conservation authorities and charts the course for the next generation of work to address the evolving issues of climate change, growth, and the need for green infrastructure. The Strategic Plan is guided by principles based on a conservation-first and ecosystem philosophy, collaboration ethics, and an importance of innovation rooted in science

VISION: Nature for all

We envision a healthy and vibrant environment with shared greenspace and clean water that sustains life for future generations.

MISSION

To create common ground for conservation-inspired action and accountability to nature.

2.2 Watershed-based Resource Management Guiding Principles

The NPCA Strategic Plan: Nature for All, establishes four Guiding Principles that guide the delivery of NPCA's programs and services.

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2.2.1 Watersheds transcend municipal boundaries

We are committed to working with the watershed community to support and create climate-resilient and connected natural systems. Integrated watershed management is our approach to managing local natural resources in partnership with our member municipalities.

2.2.2 Natural green infrastructure is critical to life

Our day-to-day work conserves and restores our communities' integral ecological, socio-economic, public safety, and health services. Watershed resources are green infrastructure and natural assets.

2.2.3 Diverse experiences and ideas lead to better and stronger collective impact and outcomes

We seek to exemplify inclusion and equity through meaningful engagement and collaboration.

2.2.4 Innovation requires learning from each other and the past

As a result, we are progressive, resilient, adaptable, and strive for continuous improvement to remain a trusted and valued partner.

2.3 Watershed-based Resource Management Guiding Goals and Actions

Collectively, the **Strategic Priorities** identified in the NPCA Strategic Plan: Nature for All, guide our actions toward a vision of the Niagara Peninsula watershed with robust nature, thriving agriculture, and resilient urban areas vital to the health and well-being of our residents. Each Strategic Priority includes specific goals and actions for the NPCA to undertake with its partners and communities to achieve a thriving environment that sustains life for future generations. The Strategic Priorities, and the specific goals and actions taken from the NPCA's 10-year Strategic Plan that guide the design and delivery of NPCA's Category 1 Mandatory Programs and Services provided under s. 21.1 of the *Conservation Authorities Act* are summarized below. The Goal numbering shown below is as listed in the Strategic Plan

2.3.1 Healthy and Climate Resilient Watersheds

Improving nature for the betterment of all life across the watershed.

- Goal 1.1 Support evidence-based decision-making for climate-resilient watersheds and shorelines
    - Expand and enhance monitoring and associated tools to fill information gaps and research needs

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  - Lead water quality (e.g., surface and groundwater) and quantity monitoring throughout the NPCA jurisdiction
  - Support municipal partners with watershed data collection and analysis to understand cumulative impacts
  - Develop a solid understanding of climate impacts and risks on NPCA watersheds
  - Implement the Source Protection Program as mandated by the *Conservation Authorities Act* and *Clean Water Act*
- Goal 1.2 Protect people and properties from natural hazards and climate impacts
  - Implement permitting and regulations under section 28 of the *Conservation Authorities Act*
  - Deliver accurate, real-time information for flood forecasting, messaging, and warning using state-of-the-art technology and communication tools
  - Complete and maintain updated floodplain and regulation mapping within the watershed
  - Develop a watershed-based resource management strategy as mandated by the Conservation Authorities Act.
  - Update shoreline management plans with a climate resilience lens
- Goal 1.4 Manage NPCA lands to increase biodiversity, habitat connectivity, and natural cover
  - Develop and update management plans for NPCA properties
  - Develop plans to manage invasive species and enhance biodiversity at NPCA properties (e.g., forest management plan)
  - Complete and implement the NPCA land acquisition strategy
  - Implement regulations under section 29 of the Conservation Authorities Act

2.3.2 Supporting Sustainable Growth

Helping to create resilient communities through land-use planning and the use of sustainable technologies to prepare for a changing climate and related environmental challenges.

- Goal 2.1 Maintain a high standard of client services, tools, and procedures for planning review and permits
  - Continuously improve implementing NPCA Client Services Standard for Plan and Permit Review protocol to support streamlining, efficiency, and transparency
  - Refine decision-support tools for efficient application management and review
  - Enhance customer service feedback mechanisms to support performance evaluation and reporting
  - Communicate the role and responsibilities of NPCA in plan review and permitting

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- Goal 2.2 Lead an integrated watershed management approach to support planning and policy for protecting and enhancing watersheds
    - Implement a proactive sub-watershed work program to complement and inform the quaternary and sub-watershed planning for growth areas within the NPCA jurisdiction within Niagara Region
    - Lead a proactive research agenda to determine cumulative watershed impacts and applied solutions from extreme weather and land-use changes
- Goal 2.3 Lead the implementation of sustainable technologies and green infrastructure best practices for climate resilience and sustainability
    - Advance the implementation of green infrastructure best practices in future development proposals and through NPCA's demonstration projects to minimize impacts to the watershed
    - Engage municipalities, the development community, and other private landowners in implementing green infrastructure and sustainability best practices and actions
    - Identify opportunities for brownfields to enhance green infrastructure or innovative planning for in-fill development
    - Develop education materials/programs to inform the public about sustainable best practices

2.3.3 Connecting People to Nature

Creating equitable access to greenspace for the health and well-being of people.

- Goal 3.1 Create equitable access to greenspace for the health and well-being of people
    - Identify and remove socio-economic barriers to accessing NPCA properties and programs
    - Proactively seek opportunities to enhance trail connections with active transportation routes
    - Highlight and promote recreation (e.g., cycling, hiking, walking, birdwatching) opportunities at NPCA properties
    - Improve services and visitor experiences at NPCA properties (e.g., buildings, trail maps, wayfinding, and accessibility, where possible)
- Goal 3.3 Improve cultural connections and heritage appreciation
    - Maintain and honour heritage buildings at NPCA properties, including St. John's, Cave Springs, Ball's Falls, and Rockway Conservation Areas
    - Examine opportunities to expand cultural connections and heritage programming at all conservation areas

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- Work with municipalities on heritage listing and designation of NPCA buildings and properties

2.3.4 Partner of Choice

Strengthening our relationships with stakeholders, partners, the watershed community, and Indigenous peoples.

- Goal 4.1 Strengthen government relations toward collective outcomes and impact
  - Develop a government relations strategy
  - Execute Memorandums of Understanding (MOUs) and Service-Level Agreements (SLAs) with Niagara's lower-tier municipalities
  - Establish the NPCA as an environmental service provider to municipals partners with co-management and delivery of programs and projects of mutual interest
  - Partner with government agencies to advance mutual goals
- Goal 4.2 Foster relationships with the community, non-government organizations, businesses, agriculture, industry, and academic institutions for collective outcomes and impact
  - Provide technical expertise to support our partners and their work through agreements

2.3.5 Organizational Excellence

Striving for excellence through high service delivery standards and accountability to the environment and its people.

- Goal 5.1 Attract, retain, and invest in high caliber, diverse talent to deliver superior outcomes
  - Ensure adequate staff capacity and resources required to deliver on superior outcomes
  - Implement health and safety and corporate wellness programs for staff well-being
  - Modernize human resource policies and practices to encourage a healthy work environment
- Goal 5.2 Improve internal operations and processes
  - Enhance tools and procedures for program and project management, planning, reporting
  - Modernize and invest in digital technology to enhance internal processes (e.g., administrative record management, customer relationship management system)
  - Deploy tools for efficient internal and external information sharing (e.g., online open data hub)
  - Provide staff training on new technologies as they are deployed
- Goal 5.3 Provide high standards of customer service

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- Develop customer service guidelines and improve customer service feedback mechanisms
- Implement a client management system that facilitates overall governance and relevant information sharing
- Provide equitable access to information (e.g., AODA standards)
- Utilize various communication tools & tactics to facilitate engagement

2.3.6 Financial Sustainability

Ensuring a financially stable and sustainable organization and continued service-delivery through innovative business models, diverse funding sources, and best practices.

- Goal 6.1 Ensure responsible, sustainable, and sound fiscal practices
  - Consistently review and update fee schedules to retain accurate cost of services
  - Demonstrate the value of NPCA programs and services to stakeholders and municipal partners
- Goal 6.2 Optimize self-generating revenue using innovative approaches
  - Broaden opportunities for potential revenue streams at conservation parks taking a balanced approach
  - Explore varied funding sources and innovative partnerships to diversify funding

3.0 MANDATORY PROGRAMS AND SERVICES

As required by O. Reg. 687/21: Transition Plans and Agreements for Programs and Services under Section 21.1.2 of the Act, the NPCA has prepared an Inventory of Programs and Services that lists all the programs and services provides that it provides under each category (i.e., Category 1, 2, and 3)

The NPCA Inventory of Programs and Services identifies five Key Service Areas:

- Natural Hazard Management
- Watershed Resource Management and Climate Change
- Other Watershed-Related Programs
- Conservation Authority Lands and Conservation Areas
- Enabling Services

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3.1 Natural Hazard Management

NPCA provides programs and services that protect people and properties from flood, erosion, and other natural hazards. Ontario's long-term prosperity, environmental health and social well-being depend on reducing the potential for public cost or risk to Ontario's residents from natural hazards. Natural hazards include dynamic beach hazard, erosion hazard, flooding hazard, hazardous lands, hazardous sites and low water or drought conditions. The NPCA provides mandatory natural hazard management programs and services to develop an awareness of the areas that are important for the management of natural hazards, such as wetlands and river valleys, understand the risks related to natural hazards and how these risks may be affected by climate change, manage risks including preventing or mitigating those risks, and promote public awareness of the risks related to natural hazards.

Natural Hazard Management Programs and Services include:

- Flood and Erosion Management
- Flood Forecast and Warning
- Water Resources Engineering
- Shoreline Hazard Management
- Environmental Planning and Policy
- Planning and Permitting
- Compliance and Enforcement
- Planning Ecology

3.2 Watershed Resource Management and Climate Change, and Other Programs

The NPCA provides programs and services that applies research and science to understand the current watershed conditions, cumulative impacts, and risks to watershed. This evidence-based science is used for developing strategies and measures to protect, enhance, and restore watersheds toward creating healthy and climate-resilient watersheds.

Watershed Resource Management and Climate Change Programs and Services include:

- Integrated Watershed Monitoring and Reporting (Water and Terrestrial Monitoring)
- Community Engagement and Ecological Restoration
- Technical Studies to inform Regulatory Mapping Updates

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- Natural Asset Management
- Special Projects (e.g., groundwater monitoring)
- Climate Change Resilience
- Watershed and Sub-watershed Resources Planning
- Other Watershed Related Programs (e.g., Drinking Source Water Protection, and the Niagara River Remedial Action Plan)
- Other Projects/Programs (supported by partnerships and external funding)

3.3 Conservation Authority Lands and Conservation Areas

The NPCA is responsible for the management of approximately 3,000 hectares of land, including 41 conservation areas essential to watershed management, environmental protection, cultural heritage and recreation.

Conservation Authority Lands and Conservation Areas Programs and Services include:

- Land Acquisition and Disposition
- Land Management Planning
- Active Recreation Programs
- Camping
- Weddings, Facility Rentals and Special Events
- Education Programs
- Day Camps
- Nature School
- Heritage Programs
- Education Events
- Land Care Program (management of conservation areas)
- Section 29 Enforcement and Compliance
- Land Lease and Agreement Management

3.4 Enabling Services

Various Enabling Services are critical for supporting NPCA programs, the Board of Directors, member municipalities, and the public to enable NPCA to operate in an accountable, transparent, efficient and effective manner.

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Enabling Services include:

- Corporate Services (e.g., Finance and Accounting, Facilities' Management, Risk Management and Administrative Support)
- Financial Services (e.g., Capital Budgeting, Capital Asset Management, Financing Planning and Forecasting, Reporting and Analysis)
- People and Performance (e.g., Talent Acquisition, Employee and Labour Relations, Training and Development, Health and Safety)
- Information Management and Technology and GIS
- Communications, Marketing and Public Relations
- Corporate Administration and Governance
- Corporate Support (e.g., Procurement, Contract Management)
- Asset Management, Capital Projects and Land Asset Coordinator
- Vehicles and Equipment

Appendix 1 includes a summary of technical studies, monitoring programs and other information on the natural resources of the NPCA relies on within its area of jurisdiction or in specific watersheds that directly informs and supports the delivery of Category 1 Mandatory Programs and Services under s. 21.1 of the *Conservation Authorities Act*.

4.0 WATERSHED ISSUES AND CHALLENGES

4.1 Issues and Challenges

A component of assessing the effectiveness of the delivery of Category 1 Programs and Services requires the NPCA to identify issues/risks/gaps that limit the effectiveness of program delivery. Issues and risks can be assessed both at the watershed and program scales. This assessment provides an opportunity for the NPCA to evaluate the need for additional actions and/or support to strengthen the delivery of Category 1 Programs and Services.

4.1.1 Climate Variability and Change

Climate change refers to changes in long-term weather patterns caused by natural phenomena and human activities that alter the chemical composition of the atmosphere through the build-up of greenhouse gases which trap heat and reflect it back to the earth's surface. Climate change impacts have the potential to be wide-reaching, affecting ecosystems, agriculture, infrastructure, water supply,

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energy, transportation systems, tourism and recreation, human health and well-being, and ultimately the economy.

Adaptation efforts minimize the level of damage, hazard and risks associated with climate change, while also recognizing new opportunities presented with our changing climate. Such adaptation efforts include: flood management programs, ecosystem enhancements, water quality and quantity, municipal plan review/input, local climate change monitoring and modelling, information management, and green infrastructure/stormwater management.

Mitigation efforts are focused on reducing greenhouse gas emissions and other causes that adversely and rapidly influence weather patterns and climatic conditions. They include: green building technologies and retrofits (e.g., LEED), energy conservation, renewable energy, reforestation, carbon sequestration (e.g., wetlands), and low impact development.

A number of the NPCA's current policies and programs help to mitigate the impacts of climate change and assist with adaptation. The NPCA will continue to undertake programs and initiatives which assist with adaptation and mitigation, and participate, coordinate and collaborate with municipal partners and other agencies in addressing the impacts of climate change

4.1.2 Increasing Growth Pressures on Watersheds

As communities grow and change, and as the need for housing increases, more and more marginal land may be considered for development. Areas susceptible to erosion and/or flooding may be identified to accommodate innovative forms of infill development and face greater development pressure. NPCA has an important role to play not only in supporting its watershed municipalities to uphold key provincial interests but will have a vital role in assessing plan review and permit applications for development in areas that are subject to natural hazards and hazardous lands. Maintaining up-to-date and accessible planning and permitting policies and regulation mapping will also assist municipalities and development proponents in understanding where development may be prohibited or limited, and therefore, direct development away from those areas.

4.1.3 Loss of biodiversity, Species at Risk, Habitat and Natural Cover

Watershed residents understand conservation as the intentional preservation of sufficient flora and fauna to ensure the longevity of our environmental systems and associated services. The loss of habitat, increased numbers of species at risk and ongoing decrease in biodiversity remains a major threat to the function and health of Niagara Watershed natural areas and a healthy local ecosystem.

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Forests and wetlands in the watershed help to clean the air and water, store and release water, and provide habitat for a wide variety of plants and animals. However, the watershed has changed dramatically over the past 200 years and most of the forests and wetlands have been cleared. Forest cover in the Niagara Peninsula watershed as evident by the current watershed report card (2023) is generally poor, especially in urban areas and productive farmlands. Many wetlands and woodlots are small and isolated but remain important for wildlife, water storage, and nutrient removal. Smaller natural areas may be more vulnerable to adjacent land practices and development pressure. Habitat loss and fragmentation prevents the movement of animals and plants, which become less abundant and more geographically restricted.

The Niagara Watershed is highly representative of the Carolinian Life Zone, the most biodiverse and threatened ecoregion in all of Canada. Research has suggested to at least double the existing natural infrastructure in this landscape through the restoration of natural cover and increased protection of land through securement to guard over 40% of Canada's species and stabilize over 150 species at risk. The NPCA's jurisdiction contains globally significant ecosystems.

The NPCA has a legacy of applying systematic conservation planning and assessment techniques as part of its Integrated Watershed Management approach that determined the Niagara Watershed contributes only 56% percent towards what science and conservation literature recommend at minimum to be considered a somewhat healthy and sustainable landscape. The NPCA has partnered in the past with Niagara Region, City of Hamilton and Haldimand County to conduct a Natural Areas Inventory; however, it is aging and needs to be updated from a temporal perspective but also from a technology perspective in terms of data structure and accessibility. Most concerning, the identification of a reserve system to objectively orient and coordinate protection, restoration and enhancement resource management tools, has yet to be envisioned for the Niagara Peninsula and those that share responsibility in managing this landscape.

Much work has yet to be considered with respect to fine scale habitat considerations for multiple species, whether at risk or not, throughout the watershed as well. There is no better demonstration of this need than the example of the Brook Trout in peril within the declining cold water reaches of the upper Twelve Mile Creek Subwatershed.

NPCA strives to strengthen its role as a trusted science broker role through the ongoing transformation of its programs and services to meet its current Strategic Plan goals associated with healthy and climate resilient watersheds and being a partner of choice. Watershed- based resource management recommendations that are readily available for the Niagara Watershed determined through robust inventory and assessment cycles (adaptive integrate watershed management) should be proactively

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available to support partners who have specific management responsibilities (i.e. natural heritage protection, stormwater management) with highly credible scientific environmental data, analysis and strategies to inform tool development (i.e. environmental policy, stormwater specifications) and updates.

4.1.4 Invasive Species

Invasive species are a major threat within Ontario and the NPCA's watershed as they become more abundant and widespread. These species outcompete native species and impact our watershed's existing natural heritage system and features. Devastation of local woodlots and forest patches from the emerald ash borer are readily evident throughout the NPCA jurisdiction. Phragmites invade the Niagara Watershed as well, while many other invasive species are present in our natural areas, and new invasive species are reported ever more frequently.

The NPCA watershed currently does not have an Invasive Species Strategy despite regularly encountering invasive species issues. A strategy would provide guidance regarding management of invasive species within the context of managing watershed-based resources holistically through adaptive integrated watershed management. The identification and validation of service gaps to address invasive species systematically and identify cross-functional dependencies and capacity opportunities within existing NPCA programs and services, and partner initiatives, would be a key outcome and recommendations of an Invasive Species Strategy and programming.

4.1.5 Impacts on Water Quality

There is an adage that proclaims what we do on the land is reflected in the water. Watershed health is strongly influenced overall by water quality indicators. Impacts are well known in the Niagara Watershed as documents through NPCA's ambient Water Quality Monitoring Program. Annual Results continue to indicate that many of the NPCA's watersheds have marginal to poor water quality. Agricultural non-point sources continue to be the predominant cause of impairment, however, point sources related to urban stormwater management contribute increasingly as well. These are compounding in that nutrients and chlorides can concentrate through capture and temporary containment in facilities, but so can their outflow rates under poor designs and increasingly intense weather conditions that can harmfully impact the flow regimes of surface water systems in turn creating increased erosion and suspended solids in our local creeks.

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Groundwater quality regularly exceeds aesthetic objectives within the Ontario Drinking Water Standards. Aquifer vulnerabilities due to land-based activities, including urban development, and management practices do persist in parts of the watershed as well.

NPCA's inherent Integrated Watershed Management (IWM) approach to conservation, managing human activities and natural resources within watershed boundaries through adaptive practices, lends itself ideally to addressing water quality issues. Many of the NPCA's current programs and services such as the Enhanced Watershed Monitoring and Reporting Program and Enhanced Watershed Restoration and Stewardship services are being objectively redesigned through the current Strategic Plan implementation to proactively and increasingly in effect, mitigate water quality impacts. The NPCA will continue to undertake programs and initiatives that focus specifically on systematically addressing the persistent water quality concerns within the Niagara Watershed until improvements are realized.

4.2 Actions to Mitigate Issues and Challenges

Through NPCA's Integrated Watershed Management approach, our foundational watershed management activities readily support our mandatory programs and services and those complementary to them. Significant investment in this approach is the primary vehicle with which to mitigate issues and challenges faced by the Niagara Watershed.

These management activities fundamentally include:

- Watershed scale monitoring, data collection and management as well as modelling;
- Watershed scale studies, plans, assessments and/or strategies;
- And watershed wide actions including stewardship, communication, outreach and education.

Watershed management also plays a crucial role in addressing the impacts of climate change, and NPCA is committed to integrating climate action into its approach. A key strategy is flood mitigation, where NPCA uses natural infrastructure, such as wetlands, to absorb stormwater and reduce the risk of flooding. Carbon sequestration is a critical focus, with efforts centered on protecting and restoring forests that capture and store carbon, thereby mitigating greenhouse gas emissions. Enhancing ecosystem resilience is a priority; by improving habitat connectivity and biodiversity, NPCA helps natural systems adapt to the variability brought by changing climate conditions.

Being able to continue to advance NPCA's programs and services forward will require the Authority to continue to broaden the sources of financial support to mitigate the risks associated with reliance on the municipal levy. NPCA continues to find success in seeking external funding sources to support the

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implementation of the Strategic Plan and programs and services. While opportunities to contend for available government grants are plentiful at present, the NPCA continues to nurture a diversity of funding strategies that includes working closely with the Niagara Peninsula Conservation Foundation (NPCF) to empower its abilities to draw donations in support of Authority programs and services. Other strategies include revenue generating corporate stewardship programming, conservation impact bonds, or participating in the emergence of bioregional funding ecosystems such as that for the Greater Tkaronto Bioregion wherein NPCA finds itself.

Enhancement of existing programs and services to assist with delivery of the Watershed Strategy has already begun through implementation of the preceding Strategic Plan. Restoration and Stewardship, Monitoring and Reporting, Education and Outreach are all transitioning towards a refreshed suite of emerging programming strongly steeped in Integrated Watershed Management principles and practices in support of, and complementary to mandatory programs and services. Rebooting formal watershed Planning programming is of utmost importance to officially facilitate the adaptive management cycle on the watershed scale and recurrently derive and track progress towards specific watershed and sub watershed management recommendations.

Restoration programming is being reoriented to be more objective instead of a broad-brush approach to proactively address known issues systematically through the adaptive management process. A target of planting 1 million trees by 2031 has been set to aggressively restore forested habitat, increase canopy cover, enhance water quality, improve biodiversity and build climate resilience across the watershed. Re-emphasis on specific restoration strategies and solutions for the Twelve Mile Creek and Four Mile Creek watershed demonstrate prioritizing sensitive watersheds with varying resource management concerns and ideally these would eventually flow from needs identified in the actions recommended in updated watershed plans. NPCA remains committed to reintroducing cost sharing services and partnerships to assist the agricultural community to put nature back on marginal and environmentally sensitive arable lands. Addressing invasive species, as well as addressing species at risk and other specific habitat requirements are also future program considerations under the intentional approach of the modern and Enhanced NPCA Watershed Restoration and Stewardship services.

The NPCA will actively pursue new and strengthen existing partnerships within the communities that we serve to ensure the preservation, maintenance, sustainability, restoration, and enhancement of the natural environment. These partnerships include those with the Federal and Provincial governments, municipalities, conservation clubs, service groups, private property owners, conservation area neighbours, adjacent Conservation Authorities, the Niagara Peninsula Conservation Foundation, as well

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as the NPCA Board of Directors, our staff, and Indigenous communities and individuals. We will develop new approaches to improve conservation efforts and streamline program delivery with these partners.

In the past partnerships such as the one between NPCA, the Niagara Region and provincial Ministry of the Environment behind the former Niagara Water Strategy (initially known as the Niagara Waters Quality Protection Strategy) that was born locally in response to the Walkerton tragedy tremendously advanced the integrated watershed management approach within the Niagara Watershed.

As required by O. Reg. 686/21, costs related to NPCA's enhanced restoration and stewardship, enhanced integrated watershed monitoring, watershed planning and studies, and education and outreach that compliment and support our natural hazard management mandate, as identified through the 2024 NPCA budget are shown in Appendix II. Prioritization of operating and capital costs to continue to support these programs and services are determined through annual budget processes.

5.0 IMPLEMENTATION AND REVIEW

Under O. Reg. 686/21: Mandatory Programs and Services, the NPCA is required to identify a process for the periodic review and updating of the Watershed Strategy, including procedures to ensure stakeholders and the public are consulted during the review and update process. Given the integrated nature of the Watershed Strategy with the Strategic Plan, the Watershed Strategy should be updated within one year of the update to the Strategic Plan. Should there be an exceptional circumstance that would warrant an earlier update to the Watershed Strategy (e.g., legislation changes), then staff could initiative an update outside of the Strategic Plan update cycle and should seek direction from the Board of Directors.

An Engagement Plan will be developed for each update to the Watershed Strategy to ensure NPCA's watershed partners, communities, indigenous communities and interested parties are appropriately consulted. Further, a Workplan identifying key tasks and general timelines will be presented to the NPCA Board upon initiation of an update to the Watershed Strategy.

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6.0 PUBLIC ENGAGEMENT

A comprehensive communications and engagement strategy was developed in the early stages of the project, outlining a multi-channel approach and combination of traditional and digital tools and methods for informing and engaging a wide range of internal and external audiences.

NPCA sought to engage Indigenous partners and peoples, partner municipalities, residents, local interest groups, environmental groups and NGOs, technical experts like engineers and consultants, members of the agriculture, environment, planning, development, tourism, and education sectors, and the public within the Niagara Region, Haldimand County, and the City of Hamilton.

Communication and engagement tactics were tailored to these audiences and for each of the three phases of the Watershed Strategy project:

- Phase One (September): Initiate Process & Collect Feedback
- Phase Two (October-November): Check-in & Validate
- Phase Three (December): Launch & Release

Guided by the 2021-2031 Strategic Plan, NPCA staff collaborated on a discussion paper outlining the vision for the continued protection of natural systems and mitigation of natural hazards in the communities we serve, as well as the process for drafting the strategy. The discussion paper was shared on the Get Involved NPCA portal, which served as the central hub offering supporting materials and resources available for review and download, and several online engagement tools.

- Survey Tool: A 10-minute survey was designed to gather input on how the community benefits from NPCA's programs and services, and what risks they perceive may affect their effectiveness.
- FAQ Tool: Identified nine questions and provided clear and concise answers to these common inquiries and concerns from the community.
- Questions: This tool provided a space for community members to ask questions for staff response.

Key outreach efforts included a Public Information Centre (PIC), stakeholder meetings, direct emails, and targeted social media campaigns. The use of both in-person and online engagement opportunities helped ensure accessibility for diverse audiences and broad participation.

A strong focus was also placed on proactive communication, using media releases, social media, and print advertising to keep the public informed of the many opportunities for engagement. NPCA was

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successful in obtaining earned media exposure from key media partners such as Niagara Dailies, Village Media, and YourTV Niagara.

Key Tools & Tactics	*Results (Ongoing until November 1)*
Get Involved NPCA – online engagement portal	793 web visits
On-line Survey	18 responses
Hybrid Public Information Centre + video	27 registrations 6 attended virtually 4 attended in-person 42 video views

NPCA staff, the Board of Directors, and the Public Advisory Committee (PAC) played an essential role in shaping the Watershed Strategy. Staff, as the experts on the ground, had opportunities to share their insights and feedback through virtual meetings, emails, and discussions. Their daily experience and expertise served as a vital sounding board for the project. The Board and PAC were updated regularly, and they provided valuable input, with PAC members also helping to share information and encourage feedback within their communities and networks.

6.1 Survey and Results

The survey launched on September 6 to encourage the public, partners, staff, and any other interested parties to provide feedback and comments on the Watershed Strategy. The main goal of the survey was to obtain feedback on how the community benefits from NPCA's programs and services, and what issues or risks they perceive may affect their effectiveness. This process provided a mechanism to update NPCA's programs and services inventory and identify where opportunities exist for improving or maintaining watershed health.

Survey results show participant's strong familiarity with NPCA programs and services, with most respondents having engaged with flood and erosion management programs, followed by natural asset management, camping, facility rentals and special events.

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Participants were provided with 10 issues or risks that could impact the effectiveness of NPCA's program and service delivery as identified by staff experts. They were asked to select the level of impact that each could have—high impact, moderate impact, slight impact, or no impact.

High Impact

- Increased growth pressures on the watersheds
- Securing additional funding sources
- Impacts on water quality
- Loss of natural vegetation cover
- Potential changes to legislation affecting Conservation Authorities
- Climate variability and change

Moderate Impact

- Invasive species
- Increasing use of NPCA conservation areas
- Public accessibility to NPCA conservation areas

Slight Impact

- Increasing demand for environmental education

While some respondents selected 'no impact' for certain risks, they were outweighed by most participants selecting that they would in fact highly impact the delivery of NPCA's programs and services.

Survey participants offered additional input pertaining to other issues or risks that NPCA should consider. Upon analysis of this feedback, most of them had already been identified, however this served as confirmation that NPCA's Watershed Strategy will align with the needs of the community it serves.

- **Biodiversity Loss and Misuse of Natural Areas**: Respondents expressed concerns about the overuse of natural areas by new users, including overfishing, unsustainable foraging (e.g., mushrooms), and the loss of protected wetlands due to policy changes and landowner actions.

- **Legislative and Policy Concerns**: Respondents suggested stricter laws to protect creeks, waterways, and natural forests, as well as measures to limit industrial access to rural lands and ensure that new developments prioritize green spaces, trees, and natural ecosystems.

- **Development Pressures**: The expansion of buildings and development in response to community growth was raised as a concern, particularly regarding its impact on natural habitats and agricultural land.

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Lastly, participants provided positive and constructive feedback on how NPCA programs and services could be enhanced. These are summarized in the following reoccurring themes:

- **NPCA Leadership and Collaboration**: Several respondents praised the improvements in NPCA's programs and services, citing strong leadership, collaboration with municipalities, and the positive working relationships fostered by NPCA's senior management.
- **Conservation and Land Protection**: Many emphasized the need for NPCA to prioritize acquiring and protecting vulnerable lands, particularly wetlands and biodiversity-rich areas within urban boundaries. Some also raised concerns about the impact of quarry developments on creeks, streams, and the surrounding ecosystems.
- **Addressing Local Environmental Issues**: Some respondents highlighted specific areas of concern, such as Two-Mile Creek in Niagara-on-the-Lake and Beaverdams Creek in Niagara Falls, encouraging a focus on these as well as increased restoration efforts, and recognition of these areas as important environmental assets.

6.2 Indigenous Engagement

Information about the Watershed Strategy was shared with local First Nations, Indigenous partners and community through email. The list of contacts included local First Nations whose Traditional Territory and/or Treaty Lands are within the NPCA watershed jurisdiction, as well as the Niagara Region Métis Council, Friendship Centres, Indigenous representatives on NPCA's Public Advisory Committee, and local Indigenous businesses and organizations.

6.3 Public Information Centre

NPCA hosted a hybrid Public Information Centre (PIC) on September 24, which was live-streamed and shared on the YouTube channel for individuals who were not able to attend. A presentation on the Watershed Strategy was delivered focused on the process, requirements from the *Conservation Authorities Act*, timelines, and a breakdown of programs and services. A question-and-answer period followed, and in-person and online attendees posed questions to NPCA staff. Attendees were encouraged to visit the Get Involved NPCA portal to fill out the survey and provide additional feedback after the meeting. A total of 27 people registered for the PIC, with four people attending in person and six attending online. The YouTube live stream received 42 views to date.

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6.4 Draft Watershed Strategy

Moving forward into Phase Three, the plan emphasizes a consistent feedback loop, with opportunities for a 3-week commenting period for the draft strategy, as well as involvement from NPCA's board and staff. The timeline culminates in a final strategy release, ensuring the community has been engaged and informed at each stage of the project.

Following the initial round of public engagement, NPCA analyzed and incorporated community feedback received through the survey, PAC member comments, and the PIC to refine key areas of most concern and proceed to developing a draft. The draft Watershed Strategy will be posted online for a 3-week commenting period. Additionally, the draft Watershed Strategy will be presented to the NPCA Board of Directors meeting in October for feedback from board members.

[This section to be completed after the draft Strategy has been posted and comments received]

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APPENDIX 1: CATEGORY 1 MANDATORY PROGRAMS AND SERVICES

A summary of existing technical studies, monitoring programs and other Information that guide NPCA's Mandatory Programs and Services

Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
Natural Hazard Management	**Protecting people and properties from flood, erosion, and other natural hazards.**		
Flood Forecast and Warning	Delivery of accurate, real-time information for flood forecasting, warning, and messaging. Issue flood warnings. Water quantity monitoring specific to flood forecasting and warning: Collect and maintain data from dams, streamflow gauges, rainfall gauges, and snow courses, as well as collect weather forecasts from various sources. Climate Monitoring	• Data on precipitation, river flows, reservoir, and Great Lake water levels taken from 21 rain gauge stations, 15 stream gauge stations, 3 Great Lakes gauge stations, and 7 snow course stations. • Observed flood elevations and data gathered in the field. • Flood messages issued by the Alertable mobile app system.	1.2, 2.2, 2.3, 4.2
Flood and Erosion Management	Management and monitoring of riverine erosion across the watershed jurisdiction. Ice management Floodplain mapping Flood and erosion risk and mitigation studies Operation and maintenance of NPCA flood and erosion control	• Digital elevation models and other geospatial data. • Watercourse floodplain mapping. • Hydrologic and hydraulic models. • Ontario Ministry of Natural Resources Flooding Hazard Technical Guidelines • Natural Hazard Infrastructure Operational Plans. • Natural Hazard Infrastructure Asset Management Plans.	1.2, 2.2, 2.3, 4.2

Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
	Infrastructures Flood and erosion hazard mitigation projects		
Shoreline Hazard Management	Shoreline management plans Integration of natural hazard management with overall shoreline climate resiliency and watershed resource management to respond to climate change risk and vulnerability Flood and erosion hazard mitigation projects	• NPCA Lake Erie and Lake Ontario Shoreline Management Plans • Digital elevation models and other geospatial data. • Ontario Ministry of Natural Resources Great Lakes Hazards Technical Guidelines	1.2, 2.2
Environmental Planning and Policy	Review and commenting on proposals, applications, or other matters under the Federal and Provincial Environmental Assessment Acts related to s. 28 and natural hazards Review and process s. 28 permit applications related to public infrastructure (e.g. Hydro One, Enbridge, Bell, municipal, DART protocol) Review and comment on municipal Official Plan Reviews and Updates as	• Conservation Authorities Act and related regulations, including O. Reg. 41/24 • Ontario Environmental Assessment Act • Municipal Class Environmental Assessment • Drainage Act; DART Protocol • 2021 MOU between Conservation Ontario and Hydro One Networks Inc. • Planning Act • NPCA Policy Document: Policies for Planning and Development in the Watershed of the NPCA	1.2, 2.1, 5.3

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Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
	well as supporting technical studies relating to natural hazards	• NPCA Procedural Manual • Mapping of natural hazards (e.g., watercourses, wetlands, unstable soil or bedrock, shoreline areas affected by flooding, erosion of dynamic beach hazards) and regulated areas and other geospatial data • Various MNR Technical Guidelines for Natural Hazards e.g. Erosion and Flooding • Recent and historical orthoimagery	
Planning and Permitting	Review and commenting on proposals, applications, or other matters under the Planning Act, Niagara Escarpment Act, and Aggregates Resources Act related to s. 28 and natural hazards Review and process s. 28 permits (not related to public infrastructure)	• Conservation Authorities Act • Ontario Regulation 41/24 • Niagara Escarpment Planning and Development Act • The Planning Act • NPCA Policy Document: Policies for Planning and Development in the Watershed of the NPCA • NPCA Planning and Procedural Manual • Shoreline Management Plans for Lake Erie and Lake Ontario • Twelve Mile Creek Slope Stability Study • MNRF Technical Guide-River and Streams Systems: Erosion Hazard Limit and Flood Hazard Limit	1.2, 2.1, 5.3

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Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
		• Mapping of natural hazards (e.g., watercourses, wetlands, unstable soil or bedrock, shoreline areas affected by flooding, erosion of dynamic beach hazards) and regulated areas and other geospatial data • Recent and historical orthoimagery	
Section 28 Compliance and Enforcement	• Investigate complaints and contraventions of Section 28 of the CA Act. • Conduct compliance inspections of issued NPCA Section 28 permits • Gain compliance with the CA Act and associated regulations for contraventions and violations • Initiate and support court proceedings where compliance is unsuccessful • Enforce court orders and settlements as required. • Provide client and public education on compliance and enforcement role of the NPCA	• Conservation Authorities Act • Ontario Regulation 41/24 • Provincial Offences Act and associated Regulations • NPCA Section 28 Compliance and Enforcement Procedural Manual, 2022 • Conservation Ontario/NPCA Section 28 Enforcement Guidelines, 2011 • NPCA Internal Standard Operating Procedures for Compliance and Enforcement • NPCA Policies for Planning and Development in the Watershed, 2022 • NPCA Planning and Permitting Procedure Manual, 2022 • Digital elevation models and other geospatial data • Recent and historical orthoimagery	1.2, 2.1, 2.2, 4.1, 5.2, 5.3

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Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
Watershed Management and Climate Change	**Programs and services to understand the current conditions, cumulative impacts, and risks to watersheds. Strategies and measures to protect, enhance, and restore watersheds toward creating healthy and climate-resilient watersheds.**		
Watershed-based Resource Management Strategy	Implementation, review and update to the strategy, including compiling existing resource, management, plans, watershed plans, studies and data	• Digital elevation models and other geospatial data • Recent and historical orthoimagery	1.1, 1.2, 2.2, 4.1, 4.2
Watershed and Sub-watershed Planning	Updates to NPCA watershed plans Sub-watershed-level assessments and analyses (e.g., water budgets, catchment assessment, non-point source modelling, groundwater modelling, and systematic conservation monitoring) Determine the cumulative watershed impacts from natural resource inventory and resource assessment studies Develop and maintain recommendations and guidelines to assist in the management of watershed natural resources	• O. Reg 686/21 • Data collected under the Provincial Water Quality Monitoring Network and the Provincial Groundwater Monitoring Network and associated reporting • Planning applications • SWAT non-point source modelling for the Welland River watershed • Source Water Protection Assessment and related reports • Natural Areas Inventory geospatial data and reports • NPCA Watershed Natural Asset Analysis and Valuation study • Floodplain Mapping and hydrologic modelling output and associated reports • Geospatial data such as Natural Areas Inventory, Hydrography, etc. • Digital elevation models, recent and historical orthoimagery	1.1, 2.2, 4.1

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Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
Water Monitoring (surface and groundwater)	Complete field sampling and maintenance of program infrastructure in support of the Provincial Water Quality Monitoring Network (PWQMN) and Provincial Groundwater Monitoring Network (PGMN).	• Ontario Regulation 686/21- Other Program and Services PWQMN and the PGMN • Watershed-based Resource Management Strategy • NPCA Enhanced Integrated Watershed Monitoring Program	1.1, 1.4, 2.2
Ecological Monitoring	Ecological monitoring on NPCA-owned lands in support of land management plans	• Conservation Areas Strategy • NPCA Enhanced Integrated Watershed Monitoring Program	1.1, 1.4, 2.2
Ecological Restoration	Internal restoration services related to conservation area land management plans Internal restoration services to support NPCA programs and services (e.g. review of s. 28 permit applications and compliance and enforcement, informing land securement strategy implementation)	• Natural Areas Inventory geospatial data and reports • NPCA Watershed Natural Asset Analysis and Valuation study • Floodplain Mapping and hydrologic modelling output and associated reports • Geospatial data such as Natural Areas Inventory, Hydrography, etc. • Digital elevation models, recent and historical orthoimagery • Various MNR Technical Guidelines for Natural Hazards e.g. Erosion and Flooding	1.3, 1.4, 4.1, 4.2
Section 28 Regulatory Mapping Technical Studies	Technical studies to support NPCA hazard management functions (e.g. Ecological land classification mapping; S.28 regulation mapping of wetlands,	• Various MNR Technical Guidelines for Natural Hazards e.g. Erosion and Flooding • Conservation Ontario/MNR Guidelines for Developing	1.1, 1.2, 1.3, 2.2, 5.2

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Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
	watercourses, and karst; Digital terrain elevation model)	Schedules of Regulated Areas (October 2005) • Conservation Ontario Procedure for Updating Section 28 Mapping (2018) • MNR Ecological Land Classification for Southern Ontario (Lee et al. 1998) • Geospatial data, DEM, and orthoimagery	
Climate Change Resilience	Climate change research to support climate change forecasting, watershed vulnerability and risk assessments, and watershed impact assessment and mitigation strategies	• Climate Projections for Niagara Region (TRCA, December 2021) • Niagara Peninsula Watershed Natural Asset Analysis and Valuation Report (Green Analytics, 2024)	1.1, 1.2, 2.3
Drinking Water Source Protection	Acts as the local watershed-level agency, known as the legislated role of Source Protection Authority (SPA) under the Clean Water Act, 2006, and are required to: • Establish and maintain the Source Protection Committee (SPC) • Provide program, administrative, technical, and scientific support to the SPC	• Clean Water Act, 2006 and associated regulations • Safe Drinking Water Act, 2002 and associated regulations • 2021 technical rules under the Clean Water Act, 2006 • Niagara Peninsula Assessment Report • Niagara Peninsula Source Protection Plan • Niagara Peninsula Explanatory Document	1.1, 4.1

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Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
	• Carry out locally initiated amendments to the Assessment Report and Source Protection Plan for the inclusion of new or changing municipal residential drinking water systems • Maintain and make accessible source protection program data to inform local decision making • Monitor Source Protection Plan implementation • Prepare annual progress reports to report on local progress. • Support municipalities and local implementors in fulfilling their Source Protection Plan implementation responsibilities	• Geospatial Data, DEM, and orthoimagery	
Conservation Authority Lands and Conservation Areas	**Manage 2,982 ha of lands, including 41 conservation areas essential to watershed management, environmental protection, cultural heritage, and recreation.**		
Section 29 Compliance and Enforcement	• Conduct compliance inspections for issued NPCA Section 29 permits and/or associated works • Investigate complaints and contraventions of Section 29 of the CA Act • Conduct routine enforcement inspections of NPCA owned	• Conservation Authorities Act • Ontario Regulation 688/21 • Provincial Offences Act and associated Regulations • NPCA Internal Standard Operating Procedures for Compliance and Enforcement • Geospatial Data, DEM, and orthoimagery	1.2, 1.4, 2.1, 5.2, 5.3

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Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
	properties for unauthorized use, hunting, trespass and/or encroachment • Initiate and support enforcements actions (notices and tickets), and court proceedings where compliance is unsuccessful • Enforce court orders and settlements as required • Provide client and public education on compliance and enforcement role on CA owned lands		
Land Care Program (conservation areas)	Management and maintenance of conservation areas (e.g., gates, fencing, signage, landscaping, pedestrian bridges, trails, parking lots, and roadways) Passive recreation Risk Management Hazard tree management Maintenance of heritage buildings Forest Management	• Conservation Areas Strategy • NPCA management and master plans • NPCA Internal Standard Operating Procedure • Geospatial Data, DEM, and orthoimagery	1.4, 3.1, 3.3

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Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
Land Acquisition and Disposition	Strategic acquisition of properties related to mitigating the risk of natural hazards in accordance with NPCA Land Securement Strategy	• Geospatial Data, DEM, and orthoimagery	1.4, 3.1
Land Management Planning	Conservation Area Land Inventory and Conservation Area Strategy Conservation Area Management Planning	• Geospatial Data, DEM, and orthoimagery	1.4
Enabling Services	**Support for all CA departments, the Board of Directors, member municipalities and the general public enables NPCA to operate in an accountable, transparent, efficient and effective manner.**		
Corporate Services	Administrative support Human resources (incl health and safety) Property taxes and occupancy costs Oversight of programs and policies Operating costs not directly related to any specific program or service (e.g., overhead) Records management Grant management	• CPA Canada Standards and Guidance Collection • CPA Canada Standards and Guidance Collection • CPA Canada Standards and Guidance Collection	5.1, 5.2, 5.3, 6.1, 6.2

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Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
Financial Services	Annual budget Accounts payable and receivable Procurement Payroll Financial analytics and reporting Audit Administration of reserves and investments	• Budget Assumptions & Timetable • CPA Canada Standards and Guidance Collection • Employment Standards Act • Collective Agreement - OPSEU L212 • CPA Canada Standards and Guidance Collection • NPCA – Reserves Policy • NPCA – Investment Policy	5.2, 5.3, 6.1, 6.2
Information Management and Technology	Digital technology, licensing fees, data/voice services Management and integration of data for geographic information system (GIS) Support open data portal and science Mapping and GIS support for watershed resources planning and natural hazards management Support development and implementation of watershed-based resource management strategy	• GO-ITS 43 Web Metadata Standard • GO-ITS 46 Common Metadata Elements Standard • Data Capture Specifications for Medium-Scale Hydrographic Features • NPCA's Digital Transformation Strategy • Bill 194 - Enhancing Digital Security and Trust Act • CA Act • Clean Water Act	1.1, 1.2, 1.3, 2.2, 5.2, 5.3

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Category 1 Program or Service	Description	Program Guidance	Strategic Plan Goals
Governance and Corporate Administration	Support to governance and corporate administration Board governance Public Advisory Committee and ad-hoc committees Strategic planning/ reporting and CAO oversight	• Conservation Authorities Act • Municipal Conflict of Interest Act • Municipal Freedom of Information and Protection of Privacy Act and R.R.O 1990, Regulation 823 under the Act • NPCA 2021-31 Strategic Plan	5.2, 5.3
Asset Management	Capital costs for flood infrastructure Capital costs for conservation land infrastructure	• CPA Canada Standards and Guidance Collection • NPCA – TCA Policy • CPA Canada Standards and Guidance Collection • NPCA – TCA Policy	1.2, 1.4, 6.3

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APPENDIX 2: 2024 NPCA BUDGET – INVENTORY OF PROGRAMS AND SERVICES FORMAT

Niagara Peninsula Conservation Authority

2024 Budgets and Municipal Levies *(Budget by Programs and Services)*

Appendix 4 - Report No. FA-41-23			Levy				Non-Levy			TOTAL
Dept	Description	Category	Niagara	Hamilton	Haldimand	Total Levy	Provincial	Federal	Self-Generated	BUDGET
General Levy - Category 1 and 2										
Natural Hazard Management										
301	Flood Forecasting and Warning	1	177,431	48,729	4,378	230,538	31,000			261,538
157	Flood and Erosion Management	1	43,554	11,961	1,075	56,590	5,200			61,790
323	Water Resources	1	79,522	21,840	1,962	103,324				103,324
329	Shoreline Hazard Management	1	18,772	5,155	463	24,390				24,390
345	Environmental Planning and Policy	1 & 2	210,237	57,738	5,187	273,162			153,000	426,162
361	Planning and Permitting	1 & 2	262,711	72,149	6,482	341,342	38,600		576,000	955,942
371	Compliance and Enforcement	1	450,929	123,841	11,126	585,895			40,800	626,695
391	Planning Ecology	1 & 2	80,852	22,205	1,995	105,052				105,052
TOTAL			**1,324,008**	**363,618**	**32,667**	**1,720,293**	**74,800**	**-**	**769,800**	**2,564,893**
Watershed Resource Management and Climate Change										
New	Watershed-based Resource Management Strategy	1	-	-	-	-	-	-	-	-
265	Watershed Monitoring and Reporting	1	251,576	69,091	6,207	326,874			12,000	338,874
217	Special Projects (groundwater sampling)	1	12,699	3,488	313	16,500				16,500
125	Regulatory Mapping Technical Studies	1	43,820	12,035	1,081	56,936				56,936
303	Climate Change Resilience	1	94,555	25,968	2,333	122,856		29,323		152,179
TOTAL			**402,650**	**110,582**	**9,934**	**523,166**	**-**	**29,323**	**12,000**	**564,489**
Other Watershed Related Programs										
205	Drinking Source Water Protection	1				-	155,909			155,909
TOTAL			**-**	**-**	**-**	**-**	**155,909**	**-**	**-**	**155,909**
Conservation Authority Lands and Conservation Areas										
489	Section 29 Enforcement and Compliance	1	52,418	14,396	1,293	68,107				68,107
427	Land Care Program	1	98,333	27,006	2,426	127,765			862,306	990,071
357	Land Management Planning	1	205,205	56,356	5,063	266,624			85,000	351,624
119	Ecology	1	108,058	29,676	2,666	140,400				140,400
TOTAL			**464,013**	**127,434**	**11,448**	**602,896**	**-**	**-**	**947,306**	**1,550,202**
Enabling Services										
101/107/127	Corporate Services (incl HR, Corp Sup, AM)	1	820,734	225,402	20,250	1,066,386	27,646	25,000	665,144	1,784,176
105	Financial Services	1	243,464	66,864	6,007	316,334				316,334
109/131	Information Management and Technology	1	584,157	160,430	14,413	758,999	9,900			768,899
103/150	Governance and Corporate Administration	1	412,284	113,228	10,172	535,684	32,377			568,061
111	Communications, Marketing and Public Relations	1	265,876	73,019	6,560	345,455				345,455
801	Vehicles and Equipment	1	201,338	55,294	4,968	261,600				261,600
153/155	Asset Management	1	15,544	4,269	384	20,197			189,966	210,163
TOTAL			**2,543,398**	**698,505**	**62,752**	**3,304,655**	**69,923**	**25,000**	**855,110**	**4,254,688**
TOTAL GENERAL LEVY			**4,734,069**	**1,300,139**	**116,802**	**6,151,010**	**300,632**	**54,323**	**2,584,216**	**9,090,181**

Niagara Peninsula Conservation Authority

2024 Budgets and Municipal Levies *(Budget by Programs and Services)*

Appendix 4 - Report No. FA-41-23			Levy				Non-Levy			TOTAL
Dept	Description	Category	Niagara	Hamilton	Haldimand	Total Levy	Provincial	Federal	Self-Generated	BUDGET
General Levy - Category 3 - Cost Apportionment MOU										
Watershed Resource Management and Climate Change										
227	Restoration	3	258,495	70,992	6,378	335,864			202,553	538,417
123	Community Engagement and Stewardship	3	224,042	61,530	5,528	291,100				291,100
343	Integrated Watershed Planning	3	202,348	55,572	4,992	262,912				262,912
TOTAL			**684,885**	**188,093**	**16,898**	**889,876**	**-**	**-**	**202,553**	**1,092,429**
TOTAL GENERAL LEVY - CATEGORY 3			**684,885**	**188,093**	**16,898**	**889,876**	**-**	**-**	**202,553**	**1,092,429**
Special Levy										
TDB	Capital and Special Projects	1	1,601,271	263,309	14,679	1,879,259			425,952	2,305,211
TDB	Land Securement	2	250,000	148,039	13,252	411,291				411,291
TOTAL SPECIAL LEVY			**1,851,271**	**411,348**	**27,931**	**2,290,550**	**-**	**-**	**425,952**	**2,716,502**
Fee for Service - Schedule A										-
265	Watershed Monitoring and Reporting						-	-	178,500	178,500
TOTAL FEE FOR SERVICE - SCHEDULE A			**-**	**-**	**-**	**-**	**-**	**-**	**178,500**	**178,500**
Provincial, Federal, Authority Generated										
Other Watershed Related Programs										-
241	Niagara River Remedial Action Plan	3					240,028	158,000		398,028
TBD	Other (new projects/programs - i.e. 2BT)	3					-			-
TOTAL							**240,028**	**158,000**	**-**	**398,028**
Conservation Authority Lands and Conservation Areas										-
395/401/403/405 407/411	Active Recreation Programs	3							2,104,031	2,104,031
413	Educational Programming	3							440,000	440,000
New	Land Management, Other Agencies	3					-			-
TOTAL							**-**	**-**	**2,544,031**	**2,544,031**
TOTAL PROVINCIAL, FEDERAL, AUTHORITY GENERATED							**240,028**	**158,000**	**2,544,031**	**2,942,059**
										-
GRAND TOTAL			**7,270,226**	**1,899,580**	**161,630**	**9,331,436**	**540,660**	**212,323**	**5,935,252**	**16,019,671**

SUMMARY								
Operating	5,418,955	1,488,232	133,699	7,040,886	540,660	212,323	5,509,300	13,303,169
Capital	1,601,271	263,309	14,679	1,879,259	-	-	425,952	2,305,211
Land Securement	250,000	148,039	13,252	411,291	-	-	-	411,291
TOTAL	**7,270,226**	**1,899,580**	**161,630**	**9,331,436**	**540,660**	**212,323**	**5,935,252**	**16,019,671**