Watershed-based Resource Management Strategy

DRAFT

October 2024

St. Clair Conservation

St. Clair Region Conservation Authority

Introduction

In accordance with direction from the Province of Ontario, the St. Clair Region Conservation Authority (SCRCA) has prepared this Watershed-based Resource Management Strategy (WBRMS) to meet the provisions set out under Section 21.1 of the *Conservation Authorities Act* (CA Act) and Ontario Regulation 686/21 (Mandatory Programs and Services). The Strategy sets out the guiding principles, objectives and resources of the SCRCA, its Categories of Programs and Services and the knowledge base for the work the SCRCA conducts on a day-to-day basis.

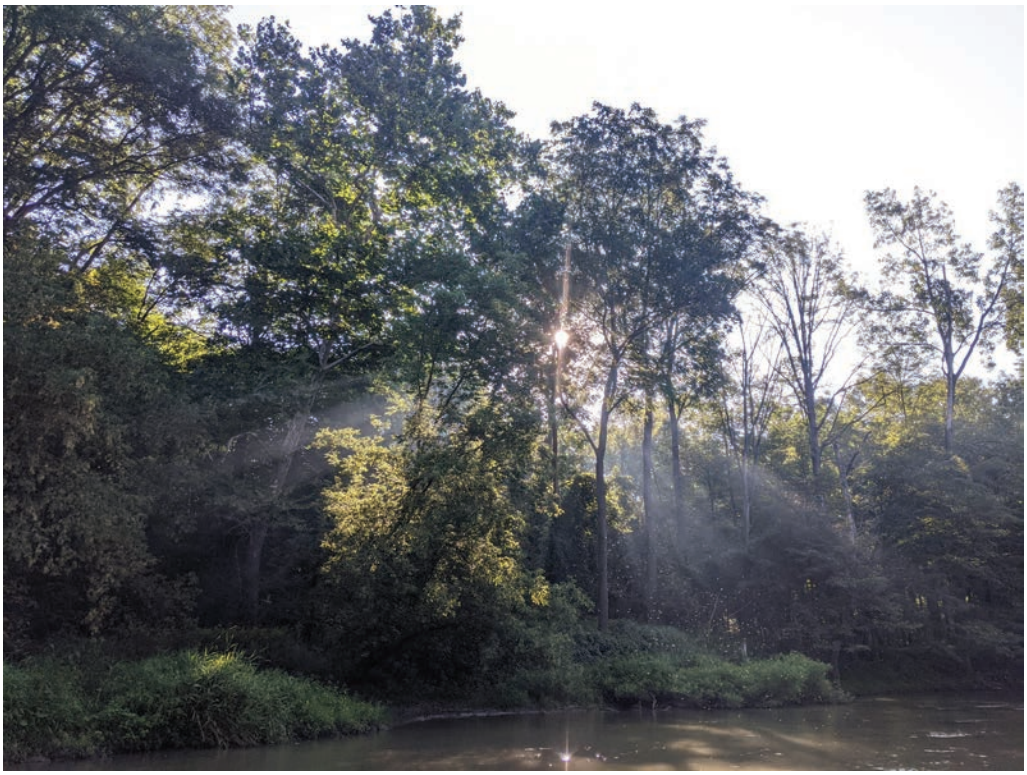
The WBRMS will assist SCRCA with enhancing the delivery of its Mandatory Programs and Services and with assessing any issues and identifying risks that impact the effective delivery of its non-mandatory programs and services. It also identifies desirable future programs, services and actions that will help the SCRCA meet its objectives and long-term goals.

Vision:

The vision of the St. Clair Region Conservation Authority reflects the future desired state of our region, that being, a healthy and sustainable natural environment in the St. Clair region.

Mission:

The St. Clair Region Conservation Authority has, as its mission, to provide leadership through coordination of watershed planning, implementation of resource management programs and promotion of conservation awareness, in cooperation with others.



Accounting for over half of the SCRCA's jurisdiction, the Sydenham River watershed covers an area of 2,751 square kilometres. It is the only major watershed that lies completely in the Carolinian Life Zone. The river suppports an incredible variety of life, making it one of the most species-rich watersheds in Canada.

Guiding Principles and Purpose

Guiding Principles

The SCRCA's approach to watershed-based resource management and the development of the organization's programs and services are guided by 4 principles:

- **Develop and maintain programs that will protect life and property from natural hazards such as flooding and erosion.**
  The SCRCA works in partnership with its municipal partners to protect life and property through the development of programs that minimize or prevent the impact of disasters such as flooding and erosion.
- **Protect, manage and restore our woodlands, wetlands and natural habitat.**
  Activities done on land are reflected in the local water and ecosystems, and as such, the SCRCA develops programs that protect our land resources and promotes watershed stewardship practices that lead to healthy, sustainable communities and industries.
- **Ensure that our rivers, lakes and streams are properly safeguarded, managed and restored.**
  Based on our system of watersheds, the SCRCA develops and delivers watershed-based programs that work with nature to protect, restore and effectively manage our water resources.
- **Provide opportunities for the public to enjoy, learn from, and respect our natural environment.**
  Through the lands we manage and own, as well as the educational programs we deliver, the SCRCA provides opportunities for our citizens to understand and appreciate the value of their natural environment as well as the social and economic benefits of protecting that environment.

Purpose of the Watershed-based Resource Management Strategy

Under the *Conservation Authorities Act*, each Conservation Authority in Ontario is required to prepare a Watershed-based Resource Management Strategy (Strategy). The goal of the Strategy is to ensure that the SCRCA's programs and services respond to watershed issues and reflect the organization's mandate under the *Conservation Authorities Act*. In developing the Strategy, watershed health and trends, program effectiveness, and other SCRCA plans and strategies that guide the organization's activities, were considered, including the following:

- The SCRCA's Strategic Plan 2023-2028
- The SCRCA Conservation Lands Strategy (2024 Draft)
- The St. Clair Region Conservation Authority Watershed Plan 1983
- The Sydenham Valley Conservation Report 1965

Consultation

The SCRCA will post a draft of the Strategy on-line for public input and circulate to member municipalities and Indigenous communities.

St. Clair Region Watershed Characteristics

The St. Clair Region Conservation Authority watershed is part of the traditional territories of the Anishinaabeg, Haudenosaunee, Lünaapéewak and Chonnonton Nations who have held a long, sacred responsibility to preserve the land and water of southwestern Ontario. The SCRCA also acknowledges the Treaties that allow us to work alongside the First Nation Communities of Kettle and Stony Point, Aamjiwnaang, and Bkejwanong (Walpole Island) First Nations to ensure the shared responsibility of preserving the land and water.

The St. Clair Region watershed is located in southwestern Ontario and is 4,130 square kilometers in size. The SCRCA watershed is comprised of the Sydenham River (East and North Branches), the St. Clair River, the southeastern section of Lake Huron, and the northeastern portion of Lake St. Clair. In total there is approximately 4,500 kilometres of watercourses (rivers, creeks, streams, and drainage systems) throughout the region.

The St. Clair Region Conservation Authority was formed in 1961 under the CA Act. It's area of jurisdiction has increase twice, first in 1974 and again in 2005. The SCRCA watershed area of jurisdiction includes all, or portions of, seventeen municipalities:

- Township of Adelaide-Metcalfe
- Municipality of Brooke-Alvinston
- Municipality of Chatham-Kent
- Township of Dawn-Euphemia
- Township of Enniskillen
- Municipality of Lambton Shores
- Municipality of Middlesex Centre
- Town of Petrolia
- Town of Plympton-Wyoming
- Village of Point Edward
- City of Sarnia
- Municipality of Southwest Middlesex
- Village of Newbury
- Village of Oil Springs
- Township of St. Clair
- Municipality of Strathroy-Caradoc
- Township of Warwick

In 2023, the watershed population was estimated to be 146,665 people with the largest concentration being within the City of Sarnia. While the watershed does contain some mid-sized communities (Corunna, Petrolia, Strathroy, and Wallaceburg), the majority of the land is dedicated to agricultural use and remains sparsely populated. Approximately 81% of land use is utilized for agriculture, largely composed of cash crops such as soy, wheat and corn. Under prefereable conditions, the SCRCA watershed would have forest cover over approximately 30% of the land, however, the region remains with only 11% forest cover. Of that 11%, most is composed of small, fragmented woodlots that do not provide large, undisturbed areas for wildlife. The SCRCA actively seeks out interested landowners willing to commit to reforestation but available land for large scale planting remains a challenge for the organization. The SCRCA plants approximately 60,000 trees (seedlings and large stock) annually.

In addition to a lack of forest cover, wetlands cover only 2.7% of the watershed, well below the 10% recommended by Environment and Climate Change Canada to provide ecological and hydrologic benefits. Historically, the watershed was dominated by wetlands, with areas such as the Enniskillen Swamp covering approximately 60% of the watershed in the early 1800s. Through the use of extensive drainage techniques, the area was turned into prime agricultural lands with municipal drains extending throughout the local landscape. It is estimated that 60% of watercourses in the watershed are municipal drains. The SCRCA works with interested landowners to convert less productive lands or retired acreage into wetlands in an effort to restore the natural heritage of the

area.

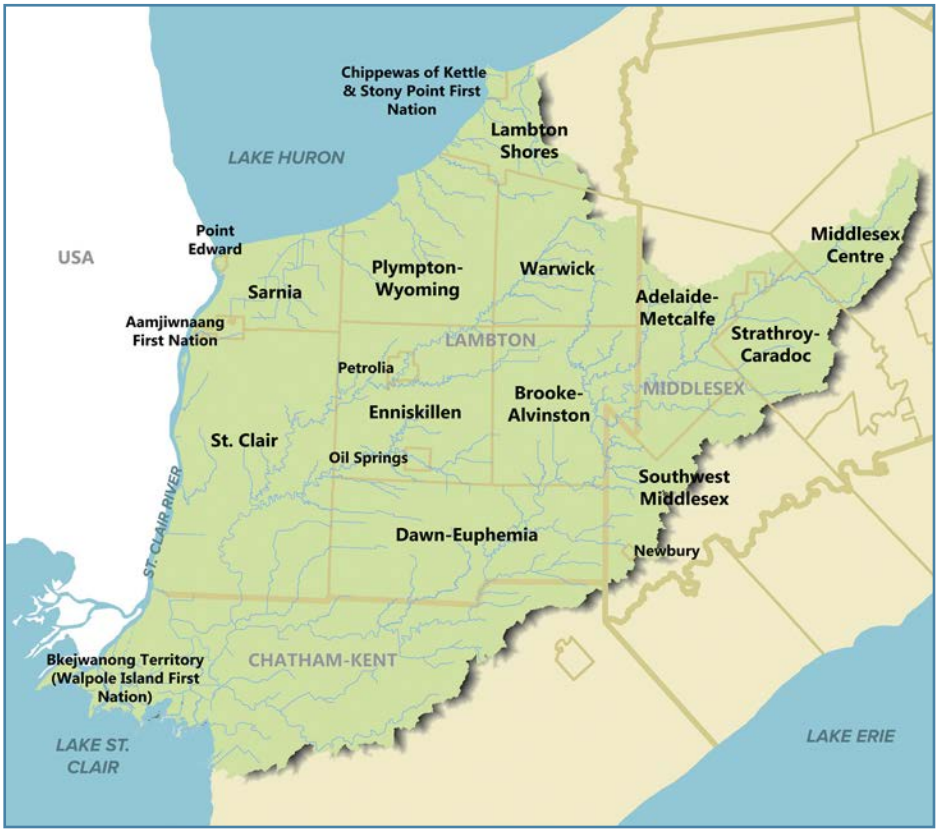
At present, the SCRCA maintains a network of stream gauges, weather stations, and snow sampling sites to monitor local watershed conditions. The SCRCA is also tasked with the operation and maintenance of the McKeough Floodway as a measure to reduce the threat of flood damage to the town of Wallaceburg located in Chatham-Kent.

The SCRCA actively monitors surface and groundwater through the Provincial Groundwater Monitoring Network (PGMN) and the Provincial (Stream) Water Quality Monitoring Network (PWQMN), along with tracking risks to municipal water supplies as part of Drinking Water Source Protection Program. SCRCA staff also utilize benthic invertebrate monitoring to assess surface water quality. Phosphorus loadings represent the greatest challenge for improved surface water quality in the SCRCA watershed. Groundwater quality can be classified as "good" based on monitoring data from nine wellheads.

The Sydenham River, with a drainage area of 2,751 square kilometres, is one of the most biologically diverse rivers in Canada. The river is home to 34 of the 41 species of freshwater mussels and 82 of 160 species of freshwater fish. Annually, SCRCA staff monitor and collect data on the various aquatic life and ecological characteristics of the Sydenham River which provides a broader picture of the river's water quality and overall watershed health.

The SCRCA owns and maintains 13 Conservation Areas that span a total of 605 hectares throughout the watershed. The SCRCA operates campgrounds, manages natural areas, and leases land for agricultural purposes. For more details, refer to the SCRCA Conservation Land Strategy.

A comprehensive list of existing technical studies, monitoring programs, and other information SCRCA staff rely on to undertake the various tasks of the organization, as well as the Categories of Services is attached in Appendix A.



The SCRCA is the 9th largest watershed by area in Ontario, and spans all or portions of 17 municipalities and two counties. There are 14 subwatersheds that drain into one of southern Lake Huron, the St. Clair River, northeastern Lake St. Clair, or the Sydenham River.

Watershed Stressors

Water Quality

Pollution in local water courses is a key issue in the SCRCA watershed. Pollution comes from various urban, residential, and agricultural sources including fertilizers, pesticides, eroded soils and improperly maintained septic systems. Rain or snowmelt wash these diffuse sources of pollution off streets, backyards, and fields, into streams, lakes, and groundwater where they can have a cumulative negative impact on local and regional water quality. Additionally, the loss of natural cover contributes to the warming of waterways and easier infiltration of pollutants into water bodies. The SCRCA has undertaken a series of initiatives, including monitoring, education, and stewardship, to raise awareness of these local issues, engage residents, and improve the health of the watershed.

The St. Clair Region watershed has been identified as a significant contributor of nutrients to Lake Erie. From 2012-2021, 90% of water quality samples in the Sydenham Watershed exceeded the Provincial Water Quality Objective (PWQO) of 0.03 mg/L for Total Phosphorus (TP).

Nutrient loadings in watersheds (primarily phosphorus) can have significant ecological and economic impacts. Nutrients often originate from both point and non-point sources. Commencing in 2025, the SCRCA will be undertaking a program, in conjunction with Environment and Climate Change Canada, to work with local stakeholders to increase awareness and the application of best management practices to help reduce phosphorous loads into local waterways.

Climate Change

In 2023 and 2024, the St. Clair Region watershed bore witness to challenges posed by climate change. Extreme storm events in both years caused extensive damage to infrastructure, homes and crops. The storm events of August 2023 and July 2024 created a challenge for the SCRCA flood forecasting and warning program as the storms manifested into very localized, intense precipitation events, that were unable to be captured by the Authority's current suite of monitoring equipment. Moving forward, the SCRCA will be increasing its monitoring network in order to acquire real-time storm data and better assist local communities. It will also be imperative to maintain up-to-date floodplain mapping resources.

The St. Clair Region watershed has also experienced periods of drought during the last three decades that have resulted in depleted aquifers, putting strain on both agriculture and natural features such as wood lots and wetlands. The SCRCA is committed to working with the local community to enhance watershed resilience to the impacts of climate change through the implementation of stewardship practices, among others.

Also of concern is the need for increased monitoring to observe the gradual rise in winter temperatures that will result in decreased snowfall amounts and less frozen ground/soil conditions during the winter months. Lack of snow cover and frozen ground will have long term impacts on the landscape and watershed conditions.

Invasive Species

Ontario is among the regions that have the highest risk for introduction of invasive species and ranks as the leader in Canada with at least 441 invasive plants and 191 non-native and invasive aquatic species in the Great Lakes.

Invasive species have impacted the St. Clair watershed with from both an economic and ecological standpoint. These impacts stem from both aquatic and terrestrial invasive species that significantly

alter ecosystem dynamics, threaten native biodiversity, and are costly and labour intensive to contain and eliminate. The most common invasive species found in the SCRCA are Invasive Phragmites (*Phragmites australis subsp. australis*), Round Goby (*Neogobius melanostomus*), and Common Carp (*Cyprinus carpio*). These three species are challenging to eradicate as they have no natural predators, can quickly dominate an ecosystem, and the monitoring and elimination of their threat has a considerable financial cost.

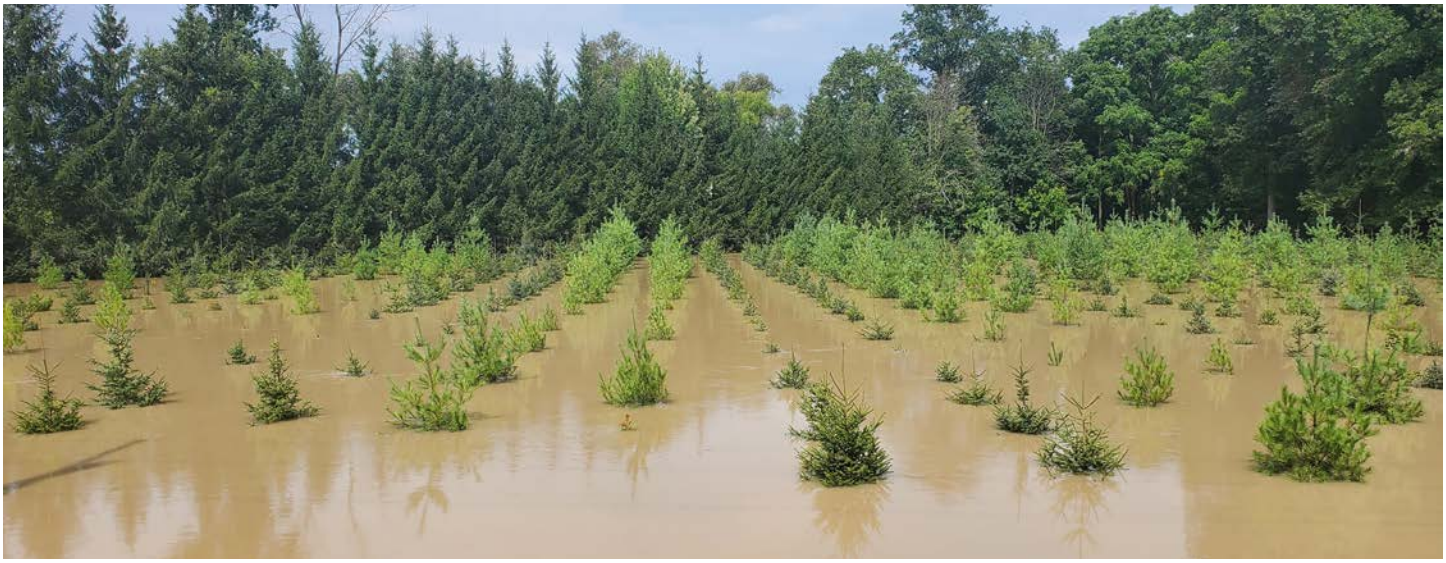
Habitat Degradation

The watershed has changed dramatically since industrialization and settlement. The woodlots that remain are often small, isolated, and fragmented making them susceptible to development pressures, invasive species, and loss of biodiversity. In addition, many of the woodlots are too small to support species reliant upon forest interior habitat. Loss of wetlands for agricultural development reduces biodiversity, natural water filtration, and flood mitigation capacity. The removal of vegetation along watercourses can destabilize stream banks and increase erosion.

Biodiversity Loss

Habitat loss and fragmentation are the biggest threats to Ontario's biodiversity as it leads to isolated populations and reduced genetic diversity. Invasive species, pollution, and climate change also have impacts on watershed biodiversity. There are 243 species at risk (SAR) in Ontario according to the Ontario Biodiversity Council. The St. Clair Region watershed is home to 33 SAR including 15 species of mussels, 10 species of fish, 3 species of snakes, and 5 species of turtles. The SCRCA actively monitors SAR and engages in intervention activities to ensure the survival of local turtle populations.

Localized flooding resulting from the August 2023 and July 2024 storm events caused extensive damage to infrastructure and crops. During both events, some areas of the SCRCA watershed received a months worth of precipitation over a 24-hour period. As a result, the SCRCA will be increasing it's monitoring network to better capture extreme storm events and assist local communities.



Watershed Resource Management Strategy

The future growth, sustainability, and prosperity of the St. Clair Region watershed depends on a robust and healthy river system. Addressing existing and emerging issues are critical in order to guarantee that the watershed remains a viable entity for generations to come. Water and ecosystems are shared resources and consequently, responsibility for these resources is shared by all who live, work, and recreate in the area. The SCRCA's Watershed-based Resource Management Strategy is driven by the legislative mandate under the *Conservation Authorities Act*, watershed issues, and municipal needs.

Objectives

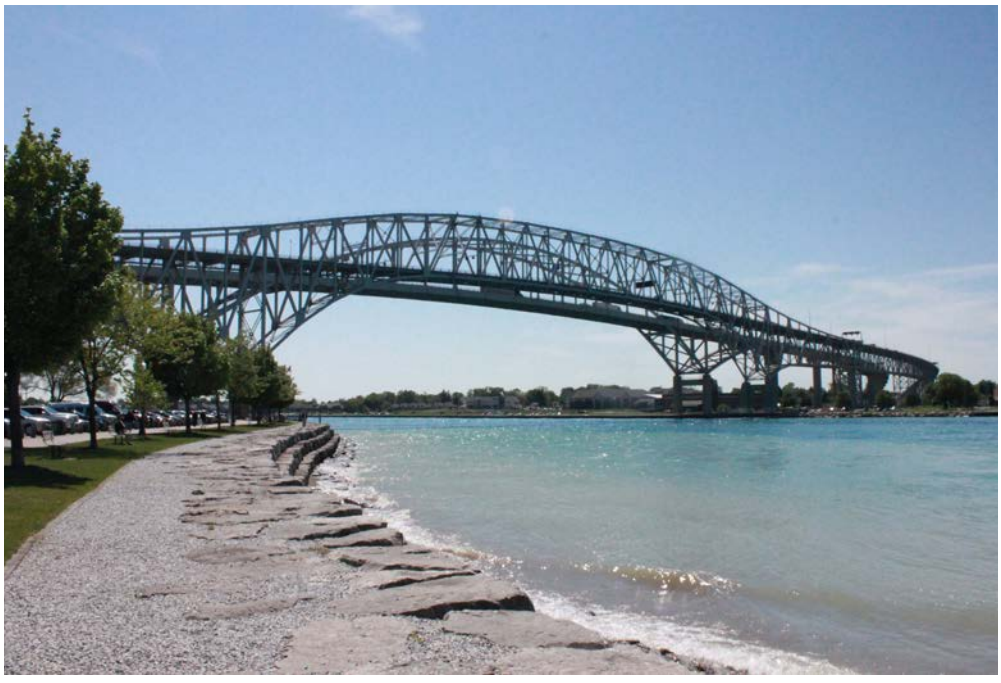
The objectives of the SCRCA's Watershed-based Resource Management Strategy are to:

1. Protect life and minimize property damage from natural hazards, including drought, flooding, erosion, dynamic beaches, and hazardous lands and sites.
2. Improve water quality to enhance water course health and reduce harmful impacts on the Great Lakes.
3. Protect, enhance, and restore natural areas.
4. Manage the SCRCA's landholdings in a responsible and sustainable way.
5. Connect people to the environment through outdoor experiences.
6. Protect drinking water sources from contamination and overuse.
7. Continue to work toward the delisting of the St. Clair River Area of Concern.
8. Increase monitoring capacity to obtain additional data used to measure watershed health.

Programs and Services

The SCRCA's programs and services contribute to achieving the Watershed-based Resource Management Strategy's objectives. A list of Authority programs along with associated guiding documents is provided in Appendix A.

The St. Clair River was identified as an Area of Concern (AOC) in 1987 due to urban and industrial development. For over 30 years, the SCRCA along with the local community, First Nation communities, government and industry have been working together to improve the water quality and aquatic habitat of the St. Clair River and remove it from the list of Great Lakes Areas of Concern.



Appendix A

St. Clair Region Conservation Authority Categories and Programs

Category 1 Programs	
Mandatory programs and services as identified in Ontario Regulation 686/21. These programs are eligible to be funded through general municipal levy (no agreement required).	
Conservation Management of CA Lands	**Guiding Document(s)**
SCRCA Forests and Management Areas (McKeough Upstream Lands)	GIS Mapping, SCRCA Strategic Plan, Managed Forest Tax Incentive Program plans, SCRCA Forest Inventories, Natural Heritage Information Centre Data, Consultant Reports, Provincial and Federal Species at Risk Recovery Strategies, Significant Wildlife Habitat technical guide, Conservation Land Tax Incentive Program plans, Ontario Minstry of Natural Resources Guidebooks
Strategy for CA Owned or Controlled Lands	GIS Mapping, SCRCA Strategic Plan
Land Acquisition and Disposition Strategy	Ontario Wetland Evaluation System, Floodplain and Natural Hazard Mapping, SCRCA fish and mussel data, Natural Heritage Information Centre data, GIS mapping
Land Inventory	GIS mapping
Land Management Plans	GIS mapping, SCRCA fish, mussel, and reptile monitoring data, Ontario Wetland Evaluation System, Floodplain and Natural Hazard Mapping, Managed Forest Tax Incentive Program plans, SCRCA Forest Inventories, Natural Heritage Information Centre Data, Consultant Reports, Municipal Age Friendly Community Action Plans, Provincial and Federal Species at Risk Recovery Strategies, Significant Wildlife Habitat Technical Guide
Watershed-based Resource Management Strategy	
Water Quality Monitoring Program	Provincial Water Quality Monitoring Network Stream Monitoring Protocol
General Operating Expenses	**Guiding Document(s)**
Corporate Services	
Administration Buildings	Asset Management Plan
Communications and Outreach	
Natural Hazards Communications, Outreach, and Education	

Financial Services	Generally Accepted Accounting Principles, *Conservation Authorities Act,* O.Reg. 686/21, O.Reg. 402/22, and O.Reg.401/22
Governance	
Information Technology	
GIS	
Watershed Geographical Information Management	
Strategy Development	
Vehicles and Equipment	Asset Management Plan
Natural Hazards, Flooding, and Erosion	**Guiding Document(s)**
Flood and Erosion Control Infrastructure (WECI)	WECI Program Guidelines
WECI Major Maintenance/Capital Projects	Engineering inspection of control structures, Internal inspection reports, Shoreline assessments
WECI Operation and Management	Dam inspection report, Risk Management reports
Drinking Water Source Protection Program	Assessment reports, Source Protection Plans
Low Water Response	Ontario Low Water Response document
Municipal Plan Input and Review	
Section 28.1 Permit Administration	
Technical Studies and Policy Review	

Category 2 Programs

Municipal programs and services that are provided at the request of the municipality. These programs can be funded through self-generated revenue, government and other agency grants, and/or municipal funding under a Memorandum of Understanding (MOU) or agreement with the municipality.

Conservation Management of CA Lands	**Guiding Document(s)**
Local Conservation Areas	GIS mapping, SCRCA fish, mussel, and reptile monitoring data, Ontario Wetland Evaluation System, Floodplain and Natural Hazard Mapping, Managed Forest Tax Incentive Program plans, SCRCA Forest Inventories, Natural Heritage Centre Information Data, Consultant Reports, Municipal Age Friendly Community Action Plans, Provincial and Federal Species at Risk Recovery Strategies, SCRCA Conservation Area Management Plans

Owned and Operation by SCRCA	GIS mapping, SCRCA fish, mussel, and reptile monitoring data, Ontario Wetland Evaluation System, Floodplain and Natural Hazard Mapping, Managed Forest Tax Incentive Program plans, SCRCA Forest Inventories, Natural Heritage Information Centre Data, Consultant Reports, Municipal Age Friendly Community Action Plans, Provincial and Federal Species at Risk Recovery Strategies, SCRCA Conservation Area Management Plans, Illustrated Technical Guide to the Accessibility Standard for the Design of Public Spaces
Long-term Lease to Municipality	GIS mapping, SCRCA fish, mussel, and reptile monitoring data, Ontario Wetland Evaluation System, Floodplain and Natural Hazard Mapping, Managed Forest Tax Incentive Program plans, SCRCA Forest Inventories, Natural Heritage Information Centre Data, Consultant Reports, Municipal Age Friendly Community Action Plans, Provincial and Federal Species at Risk Recovery Strategies, Significant Wildlife Habitat technical guide
Natural Hazards, Flooding, and Erosion	**Guiding Document(s)**
DRWSP Protection Risk Management Official	
Plan Review Not Related to Natural Hazards	

Category 3 Programs	
Other programs and services that an Authority (Board) determines are advisable. These programs can be funded through self-generated revenue, user fees, government and other agency grants, dontations, etc. Any use of municipal funding will require an agreement and would be subject to cost apportioning.	
Conservation Management of CA Lands	**Guiding Document(s)**
Managed Lands (Lambton County	GIS mapping, SCRCA fish, mussel, and reptile monitoring data, Ontario Wetland Evaluation System, Floodplain and Natural Hazard Mapping, SCRCA Forest Inventories, Natural Heritage Information Centre Data, Consultant Reports, Municipal Age Friendly Community Action Plans, Provincial and Federal Species at Risk Recovery Strategies, Lambton County Property Management Plans
Land Management for St. Clair Region Conservation Foundation	GIS mapping, SCRCA fish, mussel, and reptile monitoring data, Ontario Wetland Evaluation System, Floodplain and Natural Hazard Mapping, Managed Forest Tax Incentive Program plans, SCRCA Forest Inventories, Natural Heritage Information Centre Data, Consultant Reports, Provincial and Federal Species at Risk Recovery Strategies, St. Clair Region Conservation Foundation Property Management Plans, Conservation Land Tax Incentive Program plan, Ontario Land Trust Alliance guides
Regional Conservation Areas, including campgrounds	GIS mapping, SCRCA fish, mussel, and reptile monitoring data, Ontario Wetland Evaluation System, Floodplain and Natural Hazard Mapping, Managed Forest Tax Incentive Program plans, SCRCA Forest Inventories, Natural Heritage Information Centre Data, Consultant Reports, Municipal Age Friendly Community Action Plans, Provincial and Federal Species at Risk Recovery Strategies, SCRCA Property Management Plans, Illustrated Technical Guide to the Accessibility Standard for the Design of Public Spaces
Conservation Services	
Invasive Species Management	
Woodlands Conservation By-Law	County Woodlands Conservation By-Law, County of Lambton Woodlands Conservation By-Law policies, Ontario Ministry of Natural Resources Guidebooks
Great Lakes Regional Initiative	
Sydenham River Regional Initiative	

Watershed Report Cards	Conservation Ontario Watershed Report Card Guiding Document
General Operating Expenses	**Guiding Document(s)**
School and Community Programs	Elementary (K-8) and Secondary (9-12) Ontario Curriculum
Private Land Stewardship	
Conservation Services	
Natural Hazards, Flooding, and Erosion	**Guiding Document(s)**
Drinking Water Source Protection Program (DWSP)	Assessment reports, Source Protection Plans, Risk Management reports
Ecological Monitoring, Plans/Strategies	All federal and provincial strategies for Species at Risk, 2018 Action Plan for the Sydenham River in Canada: An Ecosystem Approach, 2003 Recovery Action Plans for Species at Risk in the Sydenham River Watershed, 2003 National Recovery Strategy for Species at Risk in the Sydenham River: An Ecosystem Approach
Municipal Drain and Fisheries Reveiw	Classifying Ontario Municipal Drains Protocol