Sault Ste. Marie Region Conservation Authority

Draft Watershed-based Resource Management Strategy

Version 1.0

2024

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1 Introduction

Conservation Authorities (CA's) are known globally for their stewardship of our rivers, lakes and streams through the development and delivery of comprehensive programs (including watershed management, erosion control, Flood Forecasting and Warning, recreation and land management, water level monitoring, and Plan Review) that work with nature to protect, restore and effectively manage Ontario's water resources. Based on Ontario's system of watersheds, their initial jurisdiction was in water resource management, which later became integrated with wise land use.

1.1 The Sault Ste. Marie Region Conservation Authority

The Sault Ste. Marie Region Conservation Authority (SSMRCA) is one of Ontario's 36 Conservation Authorities across Ontario, including one of five in northern Ontario. It is situated in the District of Algoma, on the north shore of the St. Marys River, between Lake Superior and Lake Huron. The Authority was established on November 21, 1963, with four participating municipalities: the City of Sault Ste. Marie, and the townships of Prince, Korah and Tarentorous. The subsequent amalgamation of the city and the townships of Korah and Tarentorous reduced the number of participating municipalities to two. Currently, the entire City of Sault Ste. Marie and approximately two-thirds of the Township of Prince compose the 292 square kilometer jurisdiction (Map 1) of the Authority.

Major improvements to the local infrastructure through the construction of a dam and five flood control channels have subsequently reduced the incidence of flooding that regularly occurred prior to their development. A core mandate of the SSMRCA is to prevent the loss of life and property damage due to flooding.

The SSMRCA's purpose is to provide for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in the local watershed. We improve quality of life by actively providing Conservation Areas for semi-passive recreation and environmental education opportunities.

Our integrated approach to resource management leads to a wide range of programs and projects, which are aimed at keeping our watersheds healthy. We improve quality of life by actively providing open space and protecting life and property from flooding and erosion, as well as restoring and conserving aquatic and natural habitats. In addition to serving our watershed residents, we also provide advice and counsel to all levels of government regarding natural hazards.

1.1.1 Vision

A healthy watershed existing in a balance between the natural environment and human needs.

1.1.2 Mission

To protect, improve and promote our local watershed through the delivery of resource management services and programs in cooperation with community partners.

1.1.3 Guiding Principles

The SSMRCA's approach to watershed-based resource management and the development of the organization's programs and services is guided by the following principles:

- The conservation, restoration, development, and management of natural resources is best implemented on a watershed basis.
- Water and other natural resources are vital natural assets; they buffer the impacts of climate change, mitigate natural hazards, filter contaminants, assimilate waste, sustain biodiversity, and provide green spaces for recreation, among other community benefits.
- The health and safety of watershed residents is a primary consideration for all decisions.
- Collaboration is essential, as the management of water and land is a shared responsibility among the conservation authority, municipalities, First Nations, government agencies, landowners, residents, and other interest holders.
- Conservation lands are critical for the maintenance of natural heritage features and landscapes and the health of communities. They provide environmental, economic, social, mental and physical health benefits.
- When making decisions, the SSMRCA considers the broad range of water uses and values, and the needs of natural and human communities.
- The SSMRCA's programs adapt and respond to changing conditions, priorities, vulnerabilities, and pressures.

1.2 Purpose of the Strategy

As legislated, the SSMRCA provides mandatory programs that manage the risk of natural hazards, manage lands owned or managed by the Authority, protect sources of drinking water and monitor groundwater and surface water. The Authority also provides non-mandatory programs including programs at the request of the municipality (e.g. grass cutting services).

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 SSMRCA'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 SSMRCA plans and strategies that guide the organization's activities, were considered, including the following:

- The SSMRCA's Strategic Plan
- The SSMRCA's Shoreline Management Plan
- The SSMRCA's Conservation Report
- The SSMRCA's Watershed Inventory

This document is the first version of the SSMRCA's Watershed-based Resource Management Strategy, which will guide the efficient, transparent, and inclusive approach for the delivery of mandatory programs and services provided by the Authority.

1.3 Consultation

As outlined in the regulation, conservation authorities are required to ensure stakeholders, and the public are consulted during the preparation of the Watershed-Based Resource Management Strategy in "a manner that the authority considers advisable". The SSMRCA posted the draft Strategy on its website and advised participating municipalities of the consultation period.

2 The SSMRCA's Watershed

The SSMRCA's watershed encompasses a 552 square kilometre area which includes the St. Marys River watershed and a number of smaller watersheds draining the eastern shore of Lake Superior. Sault Ste. Marie is home to approximately 75,000 people.

2.1 Physiography

The physical geography of the SSMRCA can be divided into main two ecoregions, the Chapleau Plains and the Nipissing ecoregion. The Chapleau Plains comprise the northern uplands portion of the watershed and the Nipissing ecoregion consists of the southern lowland area (Environment Canada, 1987).

The Chapleau Plains area in the uplands area consists of moderately broken terrain with bedrock exposure. There are pockets of till within this northern region which generally surround lakes and wetland areas. Along the northwestern edge of the watershed lies a strip of Wartburg till. Through the heart of this Wartburg till runs a significant escarpment which follows the Lake Superior shoreline. The other significant feature in the uplands area is the band of gravel deposits running north-south roughly following the Highway 17 North corridor.

The lowland and upland areas are roughly divided by escarpments running in a southwest to northeast direction. Moderate to strongly broken sandy loam till plains are characteristic in the Nipissing ecoregion area of the lowlands. The majority of the till in the area is Mornington Till with a number of the watercourses being associated with Dunkfeld Till.

There are two beach head areas in the lowlands. The first follows the shoreline between Sunnyside and Pointe des Chênes. There are a number of beach heads identified along this stretch of Lake Superior shoreline. Another nearly continuous terrace encircles the city of Sault Ste. Marie to the north and also follows the general shape of the present-day shoreline of the St. Marys River. This escarpment dips south moving closer to the river just east of the city's downtown, extends eastward for approximately three kilometres and then curves north. This curve in the terrace forms a plateau within the city that is locally known as "the top of the hill."

2.2 Soils Characteristics

Soils in the Chapleau Plains area of the uplands tend to be podzols and luvisols. The lowlands areas are part of the Nipissing ecoregion whose soils are characterized as podzols, brunizols and luvisols.

The City of Sault Ste. Marie is located predominantly on terraced clay lowland, bounded by a zone of surficial sand and gravel abutting the Precambrian uplands to the north and

Sault Ste. Marie Region Conservation Authority

Lake Superior

Burke Forest

Headwater Forest

Hiawatha Highlands Conservation Area

Township of Prince

City of Sault Ste. Marie

Walls Lake Forest

Gros Cap Conservation Area

Fort Creek Conservation Area

Shore Ridges Conservation Area

Mark's Bay Conservation Area

St. Mary's River

N

W E

S

0 0.5 1 2 3 4 Kilometers

the St. Marys River to the south. The area immediately adjacent to the Precambrian uplands in the south is known as the Algonquin Terrace, and consists of several benches developed during various stages of glacial Lake Algonquin's development. The clay lowland between this terrace and the St. Marys River is referred to as the Nipissing Terrace. The topography is gently sloping, and the surficial material consists of fine-textured silty soils of lacustrine origin. Most urban development has occurred within the Nipissing Terrace area.

The City of Sault Ste. Marie, thus, lies within former Lake Algonquin basin. The terraces along the Precambrian uplands formed the shorelines of the former glacial Lake Algonquin and typical beach sand and gravel deposits are found in this area. Further south, towards the central part of the former glacial lake, fine-grained glaciolacustrine deposits of clay and silt have been identified.

In the watershed, glacial activity has been largely responsible for the evolution and distribution of soil types. The northern reaches of the watershed are composed mainly of Rockland. The Albany clay and Delamere clay deposits were formed on the west side of the watershed near Lake Superior. Soil textures vary from coarse sands to fine clays, depending on the method of deposition, the parent material, climate and the time over which these deposits have been allowed to develop.

To the south, the soil type most frequently occurring is the Dockside Sand, Wendigo sandy load, medium to coarse sand. Soil depth varies over the watershed with the deeper soils restricted to the north, becoming much shallower towards the Height of Land. Soil drainage is much better developed in the sand till areas.

The Chapleau Plains area in the uplands consists of moderately broken terrain with bedrock exposure. There are pockets of till within this northern region which generally surround lakes and wetland areas. Along the northwestern edge of the watershed lies a strip of Wartburg till. Through the heart of this Wartburg till runs a significant escarpment which follows the Lake Superior shoreline. The other significant feature in the uplands area is a band of gravel deposits running north-south roughly following the Highway 17 North corridor.

The lowland and upland areas are roughly divided by escarpments running in a southwest to northeast direction. Moderate to strongly broken sandy loam till plains are characteristic in the Nipissing ecoregion area of the lowlands. The majority of the till in the area is Mornington Till with a number of the watercourses being associated with Dunkfeld Till.

There are two notable beach head areas in the lowlands. The first follows the shoreline between Sunnyside and Pointe des Chênes. There are several beach heads identified along the stretch of Lake Superior shoreline. Further inland from the beach heads lies a

terrace following the shoreline running in a northwest to southeast direction. This terrace curves around 180 degrees very roughly following the shape of the shoreline around Pointe des Chênes, Pointe Louise and Pointe aux Pins. The other area of beach heads is at the eastern edge of this terrace just west of the Big Carp River near the shore of the St. Marys River.

A third beach head is a nearly continuous terrace which encircles the City of Sault Ste. Marie to the north and also follows the general shape of the present-day shoreline of the St. Marys River.

2.3 Surface Water Hydrology

The St. Marys River is the outlet from Lake Superior and water exits the lake from Whitefish Bay flowing in a south-easterly direction. The river is the connecting channel between Lake Superior and Lake Huron. The entirety of the St. Marys drainage basin includes the Lake Superior watershed as the lake drains directly into the river. There is currently a discussion as to whether a large portion of the watershed is actually considered located in the Lake Huron watershed. The immediate watershed however consists of a number of smaller sub-watersheds in both Canada and the United States which collectively include 2600 km^2 of land and 230 km^2 of water. The Source Protection Area includes the Canadian component of the St. Marys watershed consisting of 17 sub-watersheds which each independently drain into both the St. Marys River and Lake Superior. Three of these 17 sub-watersheds drain into Lake Superior and the remaining 14 drain individually into the St. Marys River. Ten of the seventeen watersheds are substantial in area with relatively similar hydraulic characteristics. The majority have their headwaters on the high land to the north and flow south to the St. Marys River through the lower terraces.

The following includes a description of the major features of these watercourses.

2.3.1 Big Carp River

This river is the first major watercourse east of Lake Superior and encompasses an area of 58.07 km^2. The Big Carp River originates at Walls Lake in heavily forested terrain in the Precambrian Shield. Walls Lake is a small inland lake rimmed with wetland areas approximately 4 km in length. From the lake, the river flows south-easterly where it is joined by an 8 km easterly tributary. This confluence is approximately 2.4 km south of Highway 550. The river flows to the St. Marys just east of Carpin Beach (SSMRCA 1969).

Surrounding the mouth of both the Big Carp and the Little Carp Rivers is a provincially significant wetland area known as the Carp River Wetland. The wetland extends along approximately 3 km of the St. Marys shore (Cooke 2005). This wetland area is subject to flooding in times of elevated water on the St. Marys River and high surface runoff.

2.3.2 Little Carp River

The Little Carp River runs approximately 12 km from its headwaters to its mouth just east of the Big Carp River along the St. Marys River. It originates in the Precambrian Shield in the Prince Landscape at a small lake of 1.8 ha north of Third Line. From this point it flows through a steep valley south to Second Line. After this point it meanders through the lowlands of the Algonquin and Nipissing Terraces and approaches the Big Carp before meeting the St. Marys (SSMRCA 1969, & Dingwall 1982). Similar to the Big Carp, land use within this watershed is mainly undeveloped with some sparse residential and agricultural development (Burnside, 2003). Flooding at the mouth of the Little Carp River occurs similarly to the flooding at the Big Carp because of the close proximity of the mouths of these two rivers.

2.3.3 Leigh Bay Creek

Leigh Bay Creek borders the western edge of the urban area of the city. Its headwaters do not extend to the uplands area but originate in the flat lowland area just north of Second Line. The creek flow is south easterly across Second Line and Leigh's Bay Road. It then crosses Baseline and discharges to the St. Marys River. A diversion channel from the Bennett and West Davignon Creeks joins these two systems with the Leigh Bay Creek just north of the Base Line Road crossing. This diversion was built in 1979 in order to minimize flooding west of Goulais Avenue between Third Line and the St. Marys River. The outfall of the city's west end wastewater treatment plant (WWTP) is in the vicinity of the discharge point of Leigh Creek to the St. Marys River approximately 1.2 km offshore (Griffith, 2005).

2.3.4 Bennett Creek

The Bennett Creek drainage basin originates in a vast marshy area in the Precambrian Shield. It flows south-easterly from its headwaters for approximately 14.5 km to its confluence with the West Davignon Creek just south of Wallace Terrace (SSMRCA, 1969). Initially, the creek's slope is gentle, and it increases as the watercourse drops into the terraced lowlands area within the city. Flow of the creek is restricted within the urban area of the city due to road crossings prior to its confluence with the West Davignon. The Bennett-West Davignon diversion channel reduces the creeks flow just north of Wallace Terrace east of the Allan's Side Road intersection. The Bennett Creek discharges to the St. Marys River via a constructed channel.

2.3.5 West Davignon Creek

The main channel of the West Davignon Creek is approximately 11 km long. Similar to the Bennett system, the West Davignon headwaters are located high up within the Precambrian Shield. The main source for this system is Allard Lake, a lake edged by wetlands. Other wetland areas in the vicinity also contribute to the flow of this creek. Flow of the creek is generally south until it reaches Second Line at which point it swings south east. Just north of Second Line, a portion of the flow is diverted south to join the

Bennett Creek. The remaining flow meanders south east until it hits Wallace Terrace. From this point the natural creek bed has been channelled west and then south to its confluence point with Bennett Creek.

2.3.6 Central Creek

This small watercourse contributes flow to the East Davignon Creek and is almost entirely within the urban area of Sault Ste. Marie (SSMRCA, 1969). The creek begins near the intersection of Moss Road and Third Line. It flows south to a continuous concrete aqueduct at Wallace Terrace. Through the aqueduct it is discharged to the East Davignon Creek on Algoma Steel Inc. property approximately 1 km upstream of the East Davignon discharge point to the St. Marys River. Central Creek collects residential and industrial run off from the west end of the city.

2.3.7 East Davignon Creek

The East Davignon Creek head waters are located north of the city limits high within the Precambrian Shield. Nettleton Lake is a small lake (12 ha) located along the main branch of the creek at Fifth Line. The East Davignon flows south through a steep ravine to Rossmore Road. South of Rossmore Road the urban development is very close to the creek. South of Second Line, the creek is channelled into a continuous concrete aqueduct which carries the creek across Wallace Terrace and then south-westerly through the Algoma Steel Inc. property to the St. Marys River. Along this channel, discharges from Tenaris and Algoma Steel Inc. contribute to the creek flow as well as the aqueduct carrying Central Creek.

2.3.8 Fort Creek

Fort Creek originates at the northern limit of the Algonquin Terrace and flows through the heart of the urban district, located on the Nipissing Terrace. The Fort Creek dam was constructed in the 1970's upstream of the Second Line creek crossing to alleviate flood damage to the urban core. The upper two thirds of the watershed (i.e. upstream of the dam) are steeply sloped and have a number of steep sided ravines. Downstream of the dam at Second Line, the topography gently slopes south towards the St. Marys River. Below the dam, Fort Creek is conveyed by a concrete aqueduct from Hudson Street to Queen Street. Below this point, Fort Creek flows along an open channel to the St. Marys River.

2.3.9 Clark Creek

Clark Creek is an engineered drainage channel which conveys storm water run-off from the east end of the city to the St. Marys River. The creek discharges into the St. Marys River south of the Drake Street and Queen Street East intersection (Walker, 1998). From the Drake/Queen Street intersection to the discharge point on the St. Marys the creek flows through a concrete box culvert. Upstream of this culvert the creek is an open channel which extends northeast for approximately 750 metres through the Gravelle

Subdivision and the Sault Ste. Marie Golf Club and then north for approximately 900 metres to the southwest corner of Bennett Boulevard and Boundary Road (Walker, 1998).

The drainage area of the Clark Creek extends significantly further north than the intersection of Bennett Boulevard and Boundary Road due to the municipal storm sewer system in this area. There are two significant storm sewer discharges to the Clark Creek at the Bennett Boulevard and Boundary Road intersection. The creek's watershed is located in the terraced lowland area. Land use within the catchment is primarily residential resulting in high surface run-off. Development in the east end of the city has led to increased flows to the Clark Creek.

2.3.10 Root River

The Root River watershed is the largest catchment in the watershed. The basin originates in the northern uplands where a number of swamps, bogs and lakes, including Upper and Lower Island, Aweres and Trout Lakes, feed into the three main tributaries of the river; the Root, the West Root and Crystal Creek. The West Root drains the western portion of the basin and joins the main river west of Highway 17 North near the Root River Golf Course. The Crystal Creek headwaters are in the north-eastern region of the basin. The Crystal Creek joins the main river north of Highway 17 East close to the eastern boundary of the Batchewana First Nation Rankin Reserve. The Root River discharges to the St. Marys River at Bell's Point on Little Lake George.

2.4 Ground Water Hydrology

A majority of the watershed is identified as a regional recharge zone. This indicates some recharge through the thin or fine-grained surficial material that covers the majority of the watershed.

One high recharge zone is located within the Precambrian uplands. This zone is a bedrock valley filled with sand and gravel, corresponding to the valley hosting the ACR railway and Hwy 17 North corridor. Two groundwater recharge areas occur within the municipal city limits; one in the area of Gros Cap along the shore of Lake Superior in the west, and a major area at the bedrock/overburden interface along the southern contact of the Precambrian uplands in the north portion of the City. The latter of the two is providing recharge to both confined and unconfined aquifers in the vicinity of the City.

This large zone of high groundwater recharge is associated with the gravel-rich glaciolacustrine beaches deposited adjacent to the uplands. Groundwater recharge through these beach deposits occurs by direct infiltration of precipitation, and recharge from surface streams and wetlands flowing south from the impermeable bedrock highs in the north. The gravel pit operations in this area, in some cases, may also be facilitating increased recharge by collecting water in the gravel pits. However, if sand and gravel are

excavated and removed to well below the water table, the total recharge to the deeper aquifers may impact the groundwater resources in the area.

Three large areas of groundwater discharge located near the City are associated with areas of glaciolacustrine sand, particularly in the south, adjacent to the St. Marys River. These main areas of groundwater discharge are located near Pointe des Chênes Park in the west, in the area of the Central bedrock valley (City centre) and between the City and Little Lake George, associated with the Eastern bedrock valley. Smaller areas of groundwater discharge occur along the southern limits of the glaciolacustrine deposits near the uplands and form the headwaters of numerous streams there. Within the Precambrian uplands, discharge zones occur along surface watercourses, as well as the area of sand and gravel located along the northern contact of the uplands. Discharge areas also occur along the southern limits of the sand and gravel deposits close to the Precambrian uplands, which form headwaters of numerous streams.

2.5 Water Control Structures

The SSMRCA owns five (5) flood control structures in the watershed of various sizes and capacities. In addition, the SSMRCA owns and operates one (1) dam and reservoir (Map 2). The operation of these structures includes maintenance of seasonal vegetation to primarily control water levels throughout the year. These operational tasks are vital especially at key times such as flooding events. Once a flooding event has abated, the objective is to have sufficient water in the tributaries for the management of the water levels and flows for the competing interests in the watershed.

2.5.1 Bennett-West Davignon Diversion Channel

The Bennett-West Davignon diversion channel was completed in 1979 and is 6.5km in length. The drainage basin originates in a large marshy area in the north western part of Sault Ste. Marie and the headwaters of the West Davignon Creek are in the Allard Lake area. This project was intended to minimize flooding west of Goulais Avenue between Third Line and the St. Marys River. The Bennett-West Davignon flood control channel diverts water from the Bennett Creek to the West Davignon and then along Brookfield Road, across Wallace Terrace and Allen's Side Road, into the Leigh's Bay Creek and subsequently into the St. Marys River.

2.5.2 Central Creek Flood Control Channel

The Central Creek Flood Control Channel was completed in 1986 and is 2.5 km in length. This flood control channel starts near the intersection of Moss Road and Third Line and flows south to a continuous box aqueduct at Wallace Terrace, through which it flows until final discharge into The East Davignon Creek on Essar Steel Algoma Inc. property near Base Line.

2.5.3 Clark Creek Flood Control Channel

The Clark Creek Flood Control Channel was constructed in 1969 and is 1.7 km in length. It follows along Boundary Road from Bennett Boulevard, through the Sault Ste. Marie Golf Club and to Drake Street. From the intersection of Drake and Queen Street East, the creek is conveyed by a box culvert to the St. Marys River.

2.5.4 East Davignon Flood Control Channel

The East Davignon Flood Control Channel was completed in 1978 and is 1.08 km in length. This channel was designed to protect areas of Korah Road and Douglas Street from severe flooding. It extends from Rossmore Road to Farwell Terrace where the creek enters an underground aqueduct.

2.5.5 Fort Creek Channel, Dam, and Reservoir

The Fort Creek Dam and Reservoir project began in late 1967 and was completed in 1971. The drainage area for the dam is approximately 7.7 square kilometres, while the reservoir surface area is 3.24 hectares. The Fort Creek Flood Control Channel is 0.46 km in length. The dam is an earthen structure with a low permeability clay core confined by shells of granular material. The dam is 12 metres high and 117 meters long. The outlet consists of a 0.9 metre wide gate and a 91.4 metre long chute spillway passing through the base of the dam. There is also a hexagonal shaped concrete drop inlet structure/overflow weir and a broad emergency overflow spillway, temporarily blocked by a series of erodible berms with clay cores and granular shells (fuse plugs). Downstream from the dam, the Fort Creek channel crosses Second Line and John Street. Further downstream, Fort Creek is enclosed in a concrete aqueduct from Hudson Street near Wellington Street to Queen Street near John Street. The lower portion of Fort Creek is an open channel south of Queen Street to the St. Marys River.

Sault Ste. Marie Region Conservation Authority

- PGMN Well
- PWQMN Site
- Flood Channels
- DWSP Boundary
- Streets
- Waterbody
- Jurisdiction
- Watercourse
- Wetland
- SSMRCA Property
- Townships

Lake Superior

Dennis Twp

Pennefather Twp

Aweres Twp

Jarvis Twp

Duncan Twp

Burke Forest

Headwater Forest

Hiawatha Highlands Conservation Area

City of Sault Ste. Marie

Garden River First Nation

Batchewana First Nation

Township of Prince

Walls Lake Forest

Gros Cap Conservation Area

Fort Creek Conservation Area

Shore Ridges Conservation Area

Mark's Bay Conservation Area

St. Mary's River

0 0.5 1 2 3 4 Kilometers

N W E S

3 Watershed-based Resource Management Strategy

The future prosperity, growth and sustainability of the communities in the watershed depend on a healthy river system. Population growth, urbanization, agricultural production and a changing climate will continue to exert pressure on the quality and supply of water and land resources. Addressing existing and emerging resource management issues is critical for all who live, work and recreate here. Water and ecosystems are shared resources and consequently, responsibility is shared for their management.

The SSMRCA's watershed-based resource management strategy is driven by the organization's legislative mandate under the *Conservation Authorities Act*, watershed issues, and municipal needs.

The SSMRCA's programs and services have been developed to address these needs.

3.1 Objectives

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

1. Protect life and minimize property damage from natural hazards, including flooding, erosion, dynamic beaches, and hazardous lands and sites and the impacts of a changing climate.
2. Manage water to ensure sustainable water supplies for communities, economies and ecosystems.
3. Improve water quality to enhance river health and reduce the river's impact on Lake Huron.
4. To characterize groundwater and surface water resource systems and other natural resources/systems, which regulate natural hazard processes and provide drinking water sources, while supporting the hydrological and ecological integrity of the watershed.
5. Protect, enhance, and restore natural areas to improve ecosystem health and resilience.
6. To identify and understand key resource issues and the primary stressors that cause them.
7. Protect drinking water sources from contamination and overuse.
8. Connect people to the environment through outdoor experiences.
9. To protect and maintain Conservation Authority owned lands for public safety, natural heritage protection, outdoor recreation, and socio-economic health.
10. Manage the SSMRCA's landholdings in a responsible and sustainable way.

3.2 Programs and Services

The SSMRCA's programs and services contribute to achieving the watershed-based resource management strategy's objectives. Ontario Regulation 687/21: Transition Plans and Agreements for Programs and Services details requirements for Transition Plans and Agreements for Programs and Services. As per the CA Act and Ontario Regulation, the SSMRCA's Board of Directors approved the SSMRCA's Inventory of Programs and Services. The approved Inventory of Programs and Services details SSMRCA Mandatory Programs and Services (Category 1), Municipal Programs (Category 2) undertaken by the SSMRCA under agreement with the partner municipality and Other Programs and Services (Category 3) the SSMRCA undertakes.

A summary of the programs and services is provided in the following sections. The list of Programs and Services and the technical studies that guide them can be found in Appendix A.

3.2.1 Enabling Services

This program encompasses the key assistance provided to all departments of the conservation authority, board of directors, member municipalities and the general public to enable SSMRCA to operate in an accountable, transparent, efficient and effective manner. It covers the Corporate Services, Financial Services, Governance and Information Management of the conservation authority.

3.2.1.1 Risk Assessment

Issues and Risks	Potential Actions to Mitigate Risk	Cost Anticipated		
		Municipal Levy	Self-generated Revenue	Grants, Donations, and Other
Small Staff – Capacity Issues	Cross train staff in all areas. Offer competitive salaries and benefits within a positive work environment. Budget for increased staffing.	✓	✓	✓
Succession Planning	Cross train staff in all areas. Offer competitive salaries and benefits within a	✓	✓	✓

	positive work environment.			
Lack of funding support for operational costs	Regular budget planning process with Executive Committee. Continue to seek and apply for available funding.	✓	✓	
Self-generated funding is unpredictable	Plan and budget on more reliable funding sources.		✓	
Aging infrastructure (often requiring municipal funding for capital costs)	Create and maintain an Asset Management Plan. Continue to advocate for continuation of the WECI Funding Program.	✓		✓
Future known and unanticipated costs of major maintenance to buildings/equipment	Create and maintain an Asset Management Plan.	✓		
Costs of legal matters	Create and maintain a legal reserve, allocate towards when surplus funds are available.	✓	✓	
Need to acquire and maintain necessary data products (i.e. LiDAR, orthophotography) to ensure public safety, to facilitate decision making, and to create base data for updated flood plain mapping	Seek funding to complete hazard assessments and mapping of features. Advocate for an equitable funding model for small municipalities. MNR LiDAR data expected late 2024/early 2025.	✓		✓

3.2.2 Natural Hazard Management

Conservation Authorities are the lead provincial agencies on Natural Hazard issues. The goal is to protect life and property from flooding and erosion. This is a mandatory, watershed wide program that applies to the Lake Superior shoreline as well as area flood plains, valley and stream systems, wetlands and hazardous lands.

This program includes:

- Flood forecasting and warning: The SSMRCA's flood forecasting and warning program monitors watershed conditions to provide agency and public awareness of flood conditions and to provide an early warning regarding possible flood risks. The SSMRCA provides the City of Sault Ste. Marie and the Township of Prince, other agencies and the public notice of potential flood events and associated issues to allow time to prepare and respond. This program involves collection and interpretation of rain and watercourse flow data, weather forecasts, watershed conditions, snow surveys related to Lake Superior and the St. Mary's River, site conditions, watershed knowledge of susceptible areas, provincial forecasts. This information is utilized to provide safety notices and flood warnings and to liaise with provincial and municipal department and the public.
- Water control structures: The SSMRCA operates and maintains 5 major flood control structures, and one reservoir/dam. The SSMRCA has established daily reservoir target levels to guide reservoir operations. The targets provide guidance on balancing the competing objectives of having sufficient water available for flow augmentation while maintaining space available to help manage downstream flooding.
- Fort Creek Dam maintenance: The SSMRCA maintains the Fort Creek Dam's long-term operational needs. The work encompasses several critical initiatives to ensure the dam's ongoing safety, reliability, and functionality. The scope of work has included: Fort Creek dam safety reviews, maintenance work, slope stabilization, safety upgrades, a flood inundation study, a geotechnical study, and an operation, maintenance, and surveillance manual.
- Low water response: The SSMRCA coordinates and supports delivery of the provincial Ontario Low Water Response Program.
- Natural hazard mapping: The SSMRCA updates and maintains mapping of rivers, streams, floodplains, and other natural hazards, such as wetlands, steep slopes and the Lake Superior shoreline.
- Planning and regulations: A permit is required under Section 28 of the *Conservation Authorities Act* for development and other activities in regulated areas such as floodplains, wetlands, steep slopes along waterways, watercourses and the Lake Superior shoreline. The SSMRCA processes permits and also reviews

municipal planning documents and development applications under the Planning Act and other legislation to manage natural hazards.

3.2.2.1 Risk Assessment

Issues and Risks	Potential Actions to Mitigate Risk	Cost Anticipated		
		Municipal Levy	Self-generated Revenue	Grants, Donations, and Other
Climate change could result in more frequent flooding and low water events resulting in the need for more rain gauges and stream gauges, computer models for flood forecasting and flood plain mapping, and demand for more staff time and resources	Ensure staff efficiencies, budget for increased staffing. Apply for grants for climate change resiliency when available.	✓	✓	✓
Plans and Technical Studies to support decision making require considerable staff time and/or outside expertise. Municipal / provincial / federal funds and municipal agreements are needed to support completion of technical studies or mapping projects	Contribute to Special Projects Reserve when funds are available. Costs for Project Management should be built into the project when available.			✓
Major maintenance for Flood and Erosion Control works could be required when no provincial funding is available; some of the flood and erosion control structures at SSMRCA are not	Continue to regulate development in hazard areas to lessen need for control works. Continue regular maintenance of existing projects to identify upcoming	✓	✓	✓

eligible for provincial funding due to the nature of the scoring matrix for WECI funding	maintenance requirements. Municipal support and funding for future maintenance requirements.			
An increase in natural hazards enforcement and complaints results in an increased demand for staff time. Having the ability to hire new staff is paramount but limited by funding shortfalls	Offer competitive salaries and benefits within a positive work environment. Budget for increased staffing.	✓	✓	
Lack of prediction modelling capabilities with respect to Flood Forecasting and Warning	Explore affordable options for predictive modelling that align with staff capabilities.	✓		✓ (TPA with Province)

3.2.3 Monitoring Watershed Conditions (Quality and Quantity)

The SSMRCA maintains a system of monitoring stations that collects information on weather, river flows, reservoir and lake levels, groundwater levels and quality, and surface water quality. Data obtained through several monitoring programs provides the information needed to understand current conditions, identify trends, and project future changes.

- The SSMRCA undertakes surface water monitoring throughout the watershed through chemical analysis as part of the Province of Ontario Provincial Surface Water Quality Monitoring Network (PWQMN). The PWQMN water quality monitoring program is a long-standing SSMRCA and Ministry of Environment, Conservation and Parks (MECP) partnership for stream water quality monitoring. The SSMRCA undertakes the field work to gather the water samples at 4 sites (Map 2). The samples are submitted to the MECP provincial lab for analysis and data management. The results of water sampling are available to the SSMRCA and is used as part of the SSMRCA's watershed report card and overall watershed health monitoring.
- The Provincial Groundwater Monitoring Network (PGMN) is a partnership with the MECP for groundwater level and water quality monitoring at 9 wells (3 deep wells and 6 shallow wells) across the SSMRCA watershed (Map 2). This program is similar for all conservation authorities with SSMRCA costs being data collection,

shipping, minor equipment repairs/purchases, data management, and reporting. The MECP funded the installation of the network and continues to fund equipment replacements. The results of water sampling are available to the SSMRCA.

Monitoring infrastructure plays a key role in public safety, as it supports the SSMRCA's flood forecasting and warning program and other services. The information supports day-to-day decisions about dam and reservoir operations as well as long-range water management planning.

There are two active Environment Canada HYDAT gauge stations monitoring flow of watercourses within the watershed. One is located at the Big Carp River and the other is located at the Root River. There are two additional gauge stations which have historically been used to monitor flow (formerly located at Bennett Creek and the St. Marys River). Visual observations of flood conditions are also important sources of information. Operations field staff confirm and report conditions during flood events in real time.

3.2.3.1 Risk Assessment

Issues and Risks	Potential Actions to Mitigate Risk	Cost Anticipated		
		Municipal Levy	Self-generated Revenue	Grants, Donations, and Other
Potential lack of long-term access to wells on private lands	Move or close wells if required.	✓		
Location of PGMN wells to be reviewed to support SSMRCA programs (e.g. watershed report card)	Seek assistance from Province with relocation or closing wells as required.	✓		

3.2.4 Drinking Water Source Protection

The SSMRCA is a Source Protection Authority (SPA) with responsibilities for protecting municipal drinking water sources under the *Clean Water Act, 2006*. SSMRCA's watershed is within the Sault Ste. Marie Source Protection Region and includes the City of Sault Ste. Marie, Township of Prince and Sault North Planning Board. Water flows across administrative boundaries, so the best approach for planning for the protection of those sources is on a watershed basis. The Sault Ste. Marie Region is one watershed, comprised of 17 sub-watersheds with a land area of 775 square kilometres.

The SSMRCA maintains the multi-interest stakeholder Sault Ste. Marie Region Source Protection Committee (SPC) and ensures the science-based Assessment Report and

Source Protection Plan are kept current for the source protection area. The SPA supports municipalities and other implementers of source protection policies and reports annually on progress towards implementing the source protection plan.

The Sault Ste. Marie Region Assessment Report identifies areas around wells and surface intakes that are vulnerable to contamination or overuse for residential drinking water systems in the watershed. The Assessment Report also summarizes water budget studies that assess water quantity risk to current and future municipal drinking water sources. A variety of scenarios, such as future increased municipal water needs and drought, are evaluated. The City of Sault Ste. Marie depends on surface water from Lake Superior above the St. Marys River and groundwater from six wells within the watershed for its sources of municipal drinking water.

3.2.4.1 Risk Assessment

Issues and Risks	Potential Actions to Mitigate Risk	Cost Anticipated		
		Municipal Levy	Self-generated Revenue	Grants, Donations, and Other
Diminished Provincial funding to support the program	Advocate for continued Provincial funding			✓ (TPA with Province)
Lack of protection of private, non-municipal wells	Advocate for Provincial support (such as reinstatement of Provincial water testing labs) and funding under best practices			✓ (Province)
Need to continue the delivery of an effective education and outreach program to increase awareness of the program and actions the public can take to protect sources of drinking water	Seek additional funding/staffing for new tools and increased outreach. Track effectiveness of education campaigns through surveys, etc.	✓		✓
Increased development impacting drinking water vulnerable areas and the	Increase education for municipal leaders and staff to			✓

number of potential threats	understand the impact of development in vulnerable areas. Update vulnerability studies to reflect new development.			

3.2.5 Core Watershed-based Resource Management Strategy

The purpose of a watershed plan is to understand the current conditions of the watershed, and identify measures to protect, enhance, and restore the health of the watershed. Watershed strategies provide a management framework to provide recommendations which consists of goals, objectives, indicators, and management recommendations. This addresses existing issues in the watershed and mitigate impacts from potential future land uses, while recommending appropriate actions to protect, enhance, and restore the watershed.

3.2.5.1 Risk Assessment

Issues and Risks	Potential Actions to Mitigate Risk	Cost Anticipated		
		Municipal Levy	Self-generated Revenue	Grants, Donations, and Other
Lack of funding and staff capacity to update and keep current	Advocate for continued Provincial funding	✓		✓ (Province)

3.2.6 Conservation Authority Lands and Conservation Areas

The Sault Ste. Marie Region Conservation Authority owns and manages approximately 5,000 acres of land which includes conservation areas, management areas, forests, farmland, dynamic beaches and flood control structures and surrounding land. SSMRCA property is essential to watershed management, environmental protection, helps implement the Watershed-based Resource Management Strategy and provides areas for passive recreation.

SSMRCA lands comprise major components of the City of Sault Ste. Marie's natural heritage system and are integral to the features, function and biodiversity of the natural heritage system. SSMRCA lands play a critical role in the watershed natural heritage system as well as providing passive recreation lands within the watershed. SSMRCA lands augment natural heritage features within the SSMRCA's watershed and secure these lands for current and future generations. Further, these lands play a critical role in

providing critical habitat in an increasing urban area, provides a natural land area to maintain and increase biodiversity while also mitigating the effects of climate change.

The properties owned by the SSMRCA fall into three different classifications that relate to the management and use of these lands. It is highlighted that the overarching intent for management of the lands owned and managed by the SSMRCA is to ensure the conservation of the natural heritage and natural hazard features and functions found on these lands. Other uses should ultimately be complimentary to this overarching purpose and not negatively impact on these features. Passive conservation areas are free for the public to access.

1. **Conservation Area for Passive Recreation**
   (Passive Recreation, Accessible to the Public)
   This land use category would include such uses as walking, hiking, cycling, and nature interpretation. These lands contain significant natural heritage and physical landforms, and in some cases cultural heritage features. The intent with this land use category is to conserve the natural heritage and natural hazard features found on site while connecting people to nature and to instill a conservation ethic in conservation area visitors and the broader public. This land use category would apply to the following SSMRCA owned and managed lands – Fort Creek Conservation Area, Mark's Bay Conservation Area, Hiawatha Highlands Conservation Area, Shore Ridge's Conservation Area and Gros Cap Conservation Area.

2. **Conservation Authority Administrative Area**
   (Other Owned Land)
   This is the property where the SSMRCA administrative office, shop and grounds are located at – being 1100 Fifth Line East, Sault Ste. Marie.

3. **Management Area**
   (Management Lands, Other Owned Land)
   The primary land use on these lands is natural heritage and natural hazard conservation. These lands are larger or more isolated parcels that have limited facilities and access by the public varies or is completely restricted. This land use category would apply to the following SSMRCA owned and managed lands – Walls Lake Forest, Burke Forest, Headwater Forest, Fort Creek Dam and Reservoir, all flood control and diversion channels.

3.2.6.1 Risk Assessment

Issues and Risks	Potential Actions to Mitigate Risk	Cost Anticipated		
		Municipal Levy	Self-generated Revenue	Grants, Donations, and Other
Lack of natural heritage data and ongoing monitoring of natural heritage features	Budget staffing to undertake work. Prepare plan collect, maintain, and monitor data related to natural heritage features.	✓	✓	✓
Trail improvements are required for public safety and enjoyment of Conservation Lands	Create and maintain an Asset Management Plan.	✓	✓	✓
Aging Infrastructure impacting public safety and enjoyment of Conservation Lands	Create and maintain an Asset Management Plan.	✓	✓	✓
Signage updates required to address legislative and social needs	Create and maintain an Asset Management Plan.	✓		✓
Invasive species impacting the ecological health of Conservation Lands, lack of staff and resources for inventory and management of invasive species	Budget for staffing to undertake work. Grant proposals.	✓		✓
Need to improve ecosystem health through enhancement and regeneration projects	Partnerships with municipalities. Grant proposals. Budget staff time.	✓		✓
Need additional capacity to assist with Conservation Lands management	Continue to implement a Volunteer Program.	✓		
Population growth and increased outdoor activity resulting in	Create and maintain an Asset Management Plan.	✓		

increased stresses on the Conservation Areas	Increased staff presence on CA Lands.			

3.2.7 Special Projects

The SSMRCA delivers other programs that are not part of the mandatory programs and services as outlined in O. Reg. 686/21. Most of these programs are funded without municipal levy but occasionally there are opportunities for municipal participation based on special benefitting funding. All of the programs influence and enhance the health and watershed management of the SSMRCA. They are part of a larger integrated watershed management model.

These programs include:

- **St. Marys Canadian Heritage River** – the St. Marys River is one of Canada's 40 Heritage Rivers that are recognized nationally for their outstanding natural, cultural, and recreational heritage. Once rivers are designated to the Canadian Heritage Rivers System, they become part of a network of waterways that are cared for by passionate river stewards. SSMRCA is responsible for the management of this Canadian Heritage River and includes governance, administration, stakeholder and public outreach, First Nation engagement, communications, data compilation, data analysis and review, and reporting.
- **Watershed Stewardship and Restoration** - Local watershed stewardship and restoration related projects include working with local community groups to engage volunteers in tree planting on CA or partner owned lands. This program occurs as funding availability and staffing allows. This program also includes the use of CA owned lands (via MOUs) by local educational facilities (such as Sault College and Algoma University) to foster supportive experiential learning, research, and information sharing while bolstering each organizations' research capabilities.

3.2.7.1 Risk Assessment

Issues and Risks	Potential Actions to Mitigate Risk	Cost Anticipated		
		Municipal Levy	Self-generated Revenue	Grants, Donations, and Other
Require funding for long term monitoring and data compilation and management	Continue TPA with the federal agencies. Budget for staffing to undertake work.		✓	✓

	Grant proposals. Continued cooperation with partner agencies.			

3.3 Watershed Challenges

The following watershed challenges were identified during the review of background information which should be considered as part of the SSMRCA's program and services delivery in the future.

3.3.1 Increased Development Pressure

Ongoing pressure within the community as migration takes place into northern Ontario and shifting priorities towards increased housing is causing increased pressure to develop within the SSMRCA watershed, specifically increasingly closer to hazard and natural heritage lands. This creates the potential of impacting the overall watershed health trough increased pressure and demand for water resources, loss of natural ecosystem features and functions, and increased demand for green spaces which adds further pressure to the SSMRCA's infrastructure and passive-use conservation lands.

3.3.2 Climate Change

Ontario's land and water resources are at risk from climate change and will require significant effort to reduce local impacts to issues such as threats to water quality and supply, increased risk of flooding and erosion due to more extreme rainfall events, and reductions to wetlands/degraded biodiversity. Effort will involve working closely with the City of Sault Ste. Marie and Prince Township in order to develop and implement a climate change adaptation plan.

3.3.3 Invasive Species

Invasive species are a major threat within Ontario and the SSMRCA's watershed. These species compete with and displace native species and impact our watersheds natural heritage system and features.

3.3.4 Species at Risk, Biodiversity and Habitat Loss

Habitat loss, increases in the number of species at risk, and loss of biodiversity all present a major threat to the health and function of the watershed and healthy ecosystems. Human activity continues to encroach upon natural habitats locally, causing damage and destruction to the homes of numerous species.

3.3.5 Water Quality

Water quality in the SSMRCA watershed is a concern as it relates to local watercourses. The sources of these impacts vary, however, the impact of development, infrastructure,

industry, impervious surfaces, and climate change on water quality continues to be an issue.

Industry continues to be a concern locally of contaminants to the watershed.

Chloride from road salt is becoming an issue in urban areas, particularly in groundwater where salt can accumulate over time. With a push for more development in the watershed region, deterioration in water quality could occur.

4 Future Updates to the Strategy

The Strategy will be reviewed every 5 years and updated as needed. This will permit SSMRCA to adapt its programs and priorities to consider evolving political and socio-economic matters and address emerging environmental issues. Stakeholders and the public will be consulted during these periodic reviews, in a manner that aligns with the degree of revisions and meets any regulatory requirements.

APPENDIX A:

Programs & Services, Technical Studies

Category 1: Mandatory		
Programs and Services	**Description**	**Program Guidance**
Enabling Services / General Operating Expenses	Key assistance provided to all departments of the conservation authority, board of directors, member municipalities and the general public to enable SSMRCA to operate in an accountable, transparent, efficient and effective manner. Includes: • Corporate Services • Financial Services • Legal Expenses • Governance • Communications and Outreach • Administration Buildings • Information Management & GIS • Vehicles and Equipment	• SSMRCA Conservation Report • SSMRCA Strategic Plan • Human Resources Policies and Procedures Manual • Health and Safety Program Manual
Natural Hazard Management Program	Conservation Authorities (CAs) are the lead provincial agencies on Natural Hazard issues. The goal is to protect life and property from flooding and erosion. This watershed-wide, comprehensive program includes development applications and permits, municipal plan input and review, environmental planning and policy, flood forecast and warning, flood and erosion control infrastructure, technical studies, education, and public awareness. Includes:	• Dam Safety Assessments • Fort Creek Dam Operations, Maintenance and Surveillance Manual • Historical water level and flow data • Data collected for precipitation & from snow courses

	• Section 28 Administration • Municipal Plan Input and Review • Flood Forecasting and Warning • Low Water Response • SSMRCA Owned Flood and Erosion Control Infrastructure Operation and Management • Flood and Erosion Control Infrastructure Major Maintenance • Technical Studies and Policy Review • Natural Hazards Communications, Outreach and Education	• SSMRCA Conservation Report • SSMRCA's Shoreline Management Plan • Data collected for precipitation & from snow courses • SSMRCA Watershed Inventory • SSMRCA Flood Forecasting & Information System • Flood Plain Mapping Report, M. M. Dillon Report Ltd. • OMNR Technical Guide River and Stream Systems: Erosion Hazard Limit • Root River Floodplain Mapping Report, Wm. R. Walker Engineering • SSMRCA's Flood Control System Engineering Assessment Report, Conestoga-Rovers & Associates • SSMRCA Policies and Technical Guidelines
Provincial Water Quality & Quantity Monitoring	Sault Ste. Marie Region Conservation Authority, in partnership with Ministry of Environment, Climate Change and Parks (MECP), has established long term sites to monitor surface and ground water conditions as well as an investment into long-term monitoring of climate change trends. Includes:	• Data collected for precipitation & from snow courses • Historical water level and flow data • Data collected under PWQMN & PGMN

	• Provincial Water Quality Monitoring Network (PWQMN) • Provincial Groundwater Monitoring Network (PGMN)	• MECP Stream /PWQMN/PGMN monitoring protocols
Drinking Water Source Protection	The protection of municipal drinking water supplies in the Sault Ste. Marie Region Source Protection Area through the development and implementation of SSMR Source Protection Plan. Includes: • Regional Drinking Water Source Protection Program (DWSP)	• *Clean Water Act 2006* • SSMR Source Protection Plan • SSMR Watershed Characterization Assessment
Core Watershed-based Resource Management Strategy	The purpose of a watershed plan is to understand the current conditions of the watershed, and identify measures to protect, enhance, and restore the health of the watershed. Includes: • Watershed-based Resource Management Strategy	• SSMRCA Conservation Report • SSMRCA's Shoreline Management Plan • SSMRCA Watershed Inventory • SSMRCA Strategic Plan
Conservation Authority Lands and Conservation Areas	Sault Ste. Marie Region Conservation Authority owns and manages approximately 5,000 acres of land which includes conservation areas, management areas, forests, farmland, dynamic beaches and flood control structures and surrounding land. SSMRCA property is essential to watershed management, environmental protection, helps implement the Watershed Management Strategy and provides areas for passive recreation. Includes: • Conservation Areas Management including Section 29 • Conservation Area Major Maintenance • Inventory of Conservation Authority Lands	• MFTIP • Land Inventory • Conservation Lands and Areas Strategy

	• Strategy for CA owned or controlled lands and management plans • Land Acquisition and Disposition Strategy	

Category 2: Non-Mandatory Municipal Partnership Agreements		
Programs and Services	**Description**	**Program Guidance**
Natural Hazard Management Program	Conservation Authorities (CAs) are the lead provincial agencies on Natural Hazard issues. The goal is to protect life and property from flooding and erosion. This watershed-wide, comprehensive program includes development applications and permits, municipal plan input and review, environmental planning and policy, flood forecast and warning, flood and erosion control infrastructure, technical studies, education, and public awareness. Includes: • Non-SSMRCA Owned Flood and Erosion Control Infrastructure Operation and Management	• Agreement with the City of Sault Ste. Marie
Drinking Water Source Protection	The protection of municipal drinking water supplies in the Sault Ste. Marie Region Source Protection Area through the development and implementation of SSMR Source Protection Plan. Includes: • DWSP Risk Management Official • DWSP Education and Outreach	• SSMR Source Protection Plan • *The Clean Water Act 2006* • Municipal MOU(s)

Category 3: Other		
Programs and Service	**Description**	**Program Guidance**
Natural Hazard Management Program	Sault Ste. Marie Region Conservation Authority delivers other programs that are not part of the mandatory programs and services as outlined in O. Reg. 686/21. Most of these programs are funded	• Agreements with relevant agencies

	without municipal levy but occasionally there are opportunities for municipal participation based on special benefitting funding. All of the programs influence and enhance the health and watershed management of the SSMRCA. They are part of a larger integrated watershed management model. Includes: • St. Marys Canadian Heritage River • Watershed Stewardship and Restoration	