Status Report and Strategic Plan

St. Marys River Area of Concern

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Prepared by:
Lisa Derickx
St. Marys River Remedial Action Plan Coordinator
Algoma University

Executive Summary

The purpose of this document is to provide an update on the status of the St. Marys River Area of Concern and activities completed on the Canadian side that have contributed to its improved state. It also outlines a five-year plan to complete remaining activities needed to address the remaining environmental impairments and move the Area of Concern toward restoration and delisting for the Canadian side.

The St. Marys River is one of 43 Great Lakes Areas of Concern (AOCs) identified under the *Canada-U.S. Great Lakes Water Quality Agreement*. The binational agreement affirms the commitment to develop and implement Remedial Action Plans (RAPs) – using a systemic and comprehensive ecosystem approach – to restore environmental conditions in AOCs.

Figure 1: View of the St. Marys River at Bell's Point (Photo Credit: L. Derickx)

Under Annex 4 of the *Canada Ontario Agreement on Great Lakes Water Quality and Ecosystem Health*, the federal and provincial governments have committed to "make significant progress towards RAP implementation, environmental recovery and restoration of beneficial uses" in the St. Marys River AOC.

The first phase of the St. Marys River RAP identified the environmental problems and sources of pollution within the AOC; the findings of which are outlined in the St. Marys River Area of Concern 1992 Stage 1 RAP report. During the second phase over 50 remedial actions and monitoring initiatives were identified to help restore the environment by focusing on the AOC's Beneficial Use Impairments (BUIs). These are presented in the St. Marys River Area of Concern 2002 Stage 2 RAP report. Of the 14 possible BUIs identified under the *Canada- U.S. Great Lakes Water Quality Agreement*, nine were originally deemed impaired for the St. Marys River AOC, and one required further assessment. As of December 2019, six were found to be *impaired*. Whereas, the one *requiring further assessment* was found to be not impaired.

List of Acronyms

AOC – Area of Concern

BEAST – Benthic Assessment of Sediment

BPAC – Binational Public Advisory Council

BUI – Beneficial Use Impairment

COA – Canada Ontario Agreement

CSM – Conceptual Site Model

ECCC – Environment and Climate Change Canada

EEWWTP – East End Wastewater Treatment Plant

EGLE – Michigan Department of Environment, Great Lakes and Energy

IBI – Index of Biotic Integrity

IJC – International Joint Commission

MECP – Ministry of Environment, Conservation and Parks

PBDE – Polybrominated Diphenyl Ether

PCB – Polychlorinated Biphenyl

RAP – Remedial Action Plan

SMRFTG – St. Marys River Fisheries Task Group

USEPA – United States Environmental Protection Agency

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1.0 Introduction

In order to make progress towards delisting the St. Marys River Area of Concern (AOC), it is critical to evaluate work completed and identify work remaining under the St. Marys River RAP. The St. Marys River is one of 5 binational AOCs. This St. Marys River AOC Status Report and Strategic Plan outlines what remains to achieve delisting on the Canadian side of the river by identifying remedial and monitoring actions required to re-designate the remaining beneficial use impairments (BUIs). It will help gain local appreciation for the RAP's past successful initiatives and accomplishments, and help inform the community about the RAP's current status and planned/future initiatives.

1.1 The St. Marys River

The St. Marys River is a 112km waterway dividing the twin cities of Sault Ste. Marie in Ontario and Michigan. These cities are connected via an International Bridge. The river is a connecting channel, with outflows from Lake Superior and flows into Lake Huron. It is an important shipping route being part of the Great Lakes – St. Lawrence Seaway.

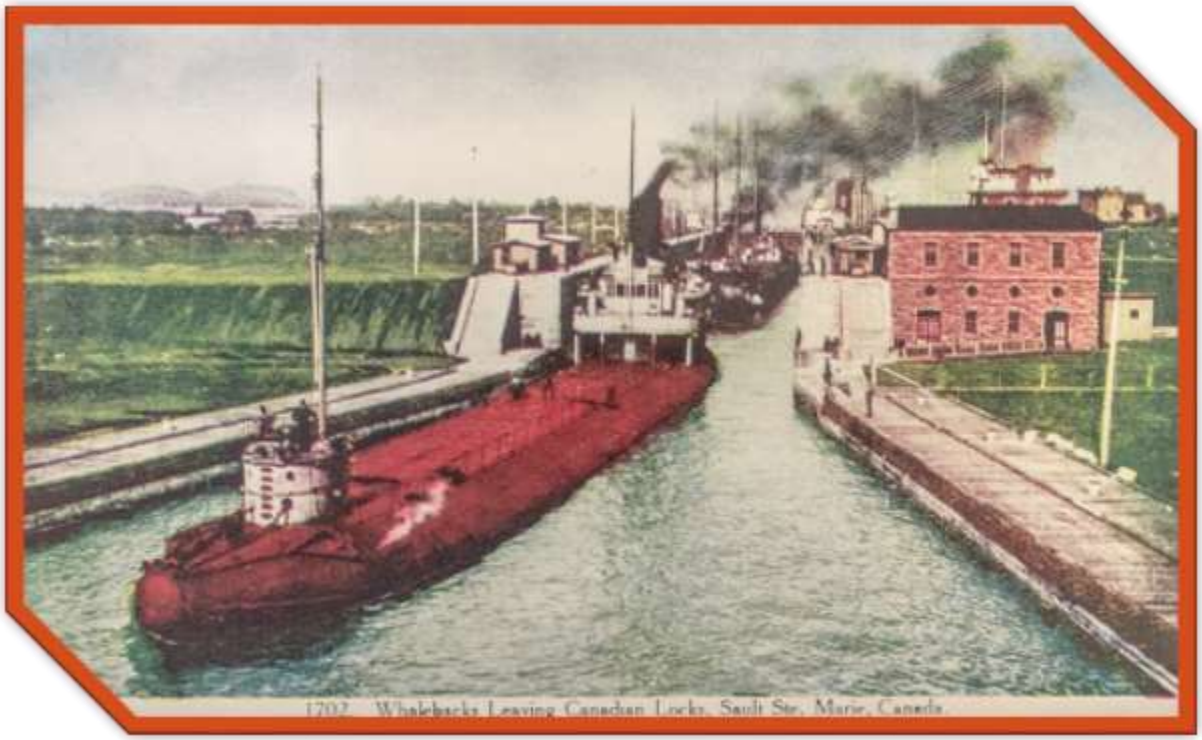

Figure 2: Vessels leaving the Canadian Locks in Sault Ste. Marie, Canada (Image Courtesy of the Sault Ste. Marie Museum).

The river is heavily industrialized and urbanized around the rapids at the twin Saults. Figure 3 shows an aerial view of Sault Ste. Marie, Ontario's industry back in 1958. Access to the waterfront has been preserved, and since the time of the photograph, the waterfront has been made more recreationally friendly with projects such as the construction of the waterfront boardwalk. This boardwalk is located along the St. Marys River and is situated in the downtown area ofSault Ste Marie (City of SSM, 2019). Residents and tourists can enjoy the river by using the shoreline boardwalk or taking a nature hike at Batchewana First Nation's Whitefish Island. Communities downriver, which include Garden River First Nation, Echo Bay, Laird and Richards Landing are smaller and have had less of an impact on the shoreline.

The St. Marys Rapids is a productive habitat for fish and an important sport fishery. Fishing the rapids has always been a vital source of food for Indigenous peoples. The area is called Baawitigong, which means "place of the rapids" (NORDIK, 2017). The rapids are located downstream of the compensating works, which control the outflow of water from Lake Superior (IJC, 2019).

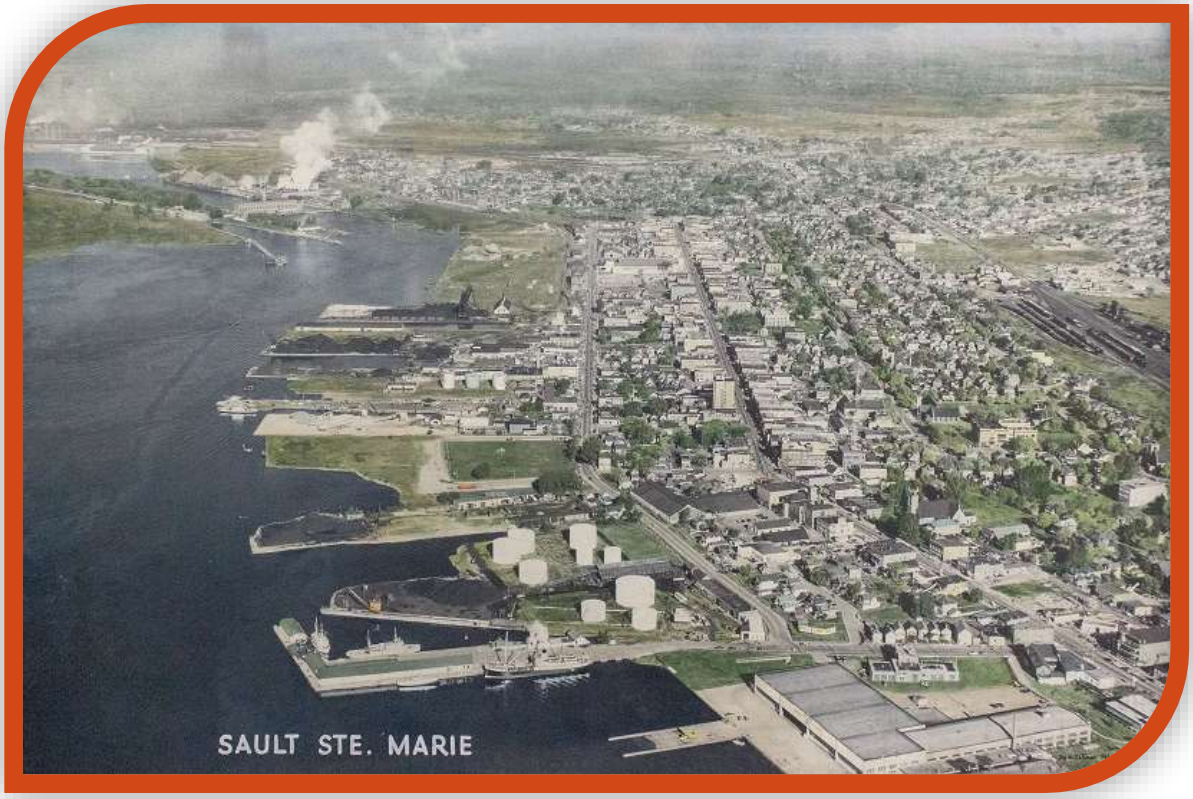

Figure 3: Aerial view of Sault Ste. Marie in 1958 (Image Courtesy of the Sault Ste. Marie Museum).

1.2 The St. Marys River Area of Concern

In the 1987 Protocol to the *Canada-U.S. Great Lakes Water Quality Agreement*, the two nations recognized 43 Areas of Concern (AOC) in the Great Lakes Basin; including the St. Marys River. The agreement was renewed in 2012. As part of this agreement, RAPs are developed to identify and restore environmental impairments in these areas. An Area of Concern, or AOC, is the term used to identify hotspots on the Great Lakes where the environment has been harmed to the point that it affects the use and enjoyment of that area or the overall health of the lake or river (Canada, 2019).

Historically, pollution from industrial sources, such as effluents from the pulp and paper mill and steel production, insufficiently treated municipal and private sewage, and contaminated stormwater runoff from the surrounding watershed has contributed to the degradation of the water quality in the St. Marys River. While inputs of pollution into the river are no longer as severe as they used to be, the legacy of environmentally harmful activities has left environmental impairments, particularly on fish and their habitat, and contaminants within the sediment composition (Stage 2 RAP, 2002).

Figure 4: Historical Photograph of Algoma Steel in 1952 (Image Courtesy of the Sault Ste. Marie Museum).

The Canadian portion of the St. Marys River AOC stretches from Gros Cap, at the mouth of Whitefish Bay and runs into two channels that partially encompass St. Joseph Island to the east (Figure 5).

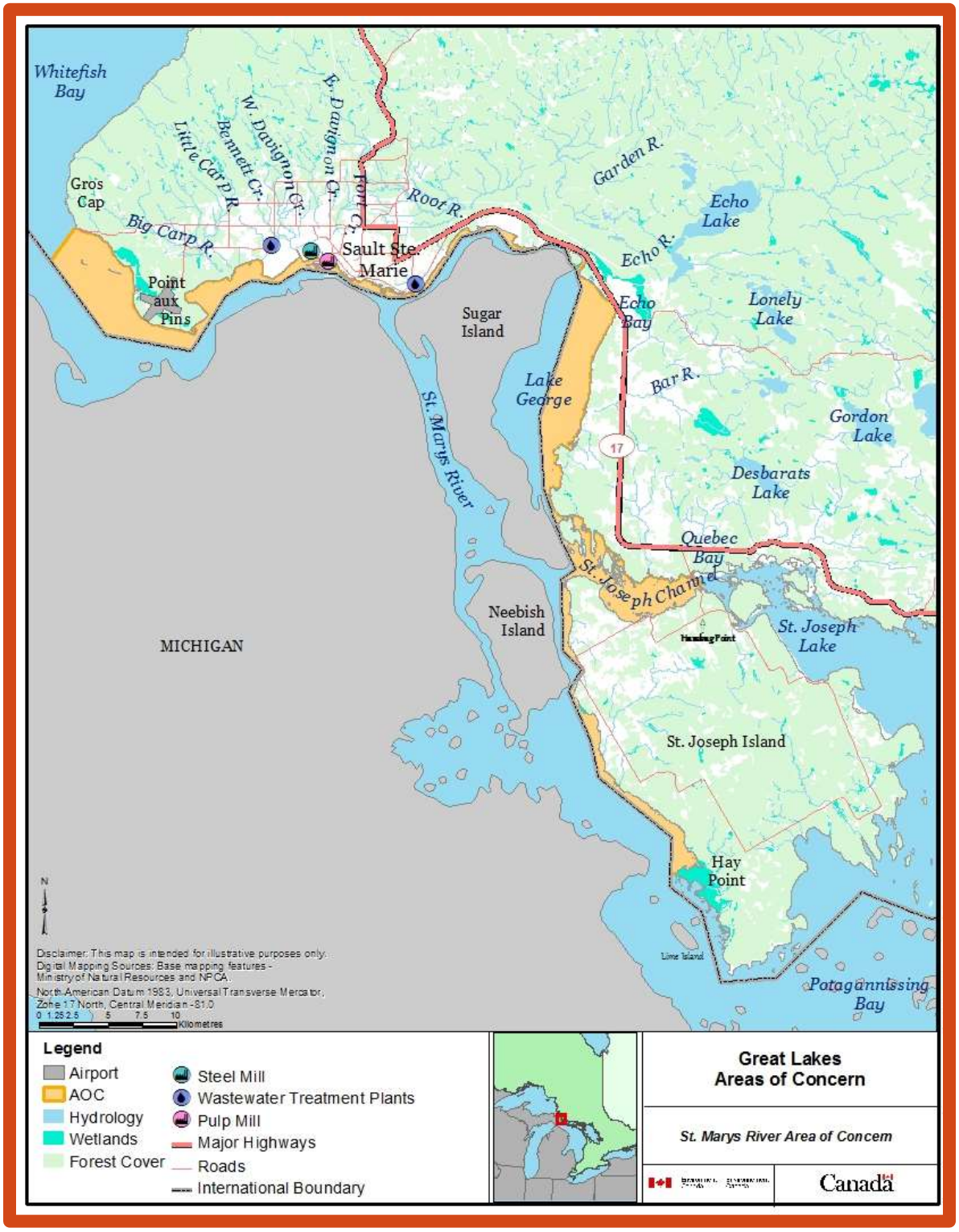

Figure 5: The Canadian portion of the St. Marys River Area of Concern

1.3 Remedial Action Plan

The Stage 1 RAP report for the St. Marys River was completed in 1992, and provides a summary of environmental conditions and impairments that existed in the early years of the AOC. It identified the sources of contaminants and activities that had caused the impairment of beneficial uses. A beneficial use impairment (BUI) is a detrimental change in the chemical, physical or biological integrity in the Great Lakes system. BUIs are used as a framework for directing remediation and monitoring efforts in AOCs.

The Stage 2 RAP report, completed in 2002, outlined the strategy to remediate the impaired beneficial uses identified under the Stage 1 RAP report (1992), and defined an original set of delisting criteria to measure progress towards re-designating the BUIs. Delisting criteria are a set of targets that measure restoration as it relates to recovery and improvement of the individual BUIs. For "impaired" BUIs to be re-designated to "not impaired", the delisting criterion developed specifically for the BUI must be met.

The St. Marys River is a binational AOC that straddles the border between Canada and the United States. Both Canada and the United States helped to develop the Stage 1 and Stage 2 RAP reports. However, implementation of the RAP is conducted independently within each country. This status report pertains only to RAP implementation on the Canadian side of the AOC. A BUI status table for each country can be seen in the Appendix.

The delisting criteria for BUIs identified in the St. Marys River AOC have since been revised to reflect current science and the approach to using indicators to measure ecosystem health. Delisting criteria that are broad, subjective, or immeasurable make the assessment of ecosystem health difficult. Therefore, in an effort to define meaningful targets, the delisting criteria were updated to follow the SMART test, meaning that they are Specific, Measurable, Achievable, Relevant, and Time-oriented. Currently, the delisting criteria for all the BUIs have been updated except for the *Degradation of Benthos* BUI, which is expected to be completed in 2020.

Over 50 recommended remedial and monitoring actions were included in the Stage 2 RAP report to help restore the beneficial uses in the St. Marys River AOC. It should be noted that this document matches the format used in the Stage 2 RAP report so that easy tracking and comparisons can be made. The following table summarizes the acronyms used to describe the different remedial and monitoring actions.

Table 1: Acronyms used in the Stage 2 RAP for remedial and monitoring actions

PS	Point source related actions
NPS	Non-point source related actions
PSM	Point source monitoring actions
NPSM	Non-point source monitoring actions
FF	Flora and fauna related actions

FFM	Flora and fauna monitoring actions

1.4 Community Involvement

The St. Marys River Binational Public Advisory Council (BPAC) was created in November 1988 to advise and assist government agencies responsible for preparing and implementing the RAP for the St. Marys River AOC. As a multi-stakeholder's group, BPAC members include residents and property owners, US Tribes, elected officials, health units, municipal staff, and university staff from both Canada and the United States. Specifically, BPAC coordinates RAP public engagement by informing the agencies about public opinions. These public views include issues such as the clean-up of the St. Marys River AOC and advocating for projects that aim to achieve the restoration goals established under the RAP.

2.0 Beneficial Use Impairments

2.1 Current Status

The St. Marys River was originally designated an AOC because 9 of the 14 beneficial uses defined by the *Great Lakes Water Quality Agreement* were "impaired" for both sides of the river, and one required further assessment. There has been improved water quality and ecosystem health, leading to several BUIs being re-designated not impaired for the Canadian side of the AOC (Table 2).

Table 2: Status of Beneficial Use Impairments for the St. Marys River AOC

Beneficial Use Impairment (BUI)		Status
Impaired		
1a	Restrictions on Fish Consumption	Impaired
3a	Degradation of Fish Populations	Impaired
4	Fish Tumours or Other Deformities	Impaired
6	Degradation of Benthos	Impaired
7	Restrictions on Dredging Activities	Impaired (change to Not Impaired recommended)
14a	Loss of Fish Habitat	Impaired
14b	Loss of Wildlife Habitat	Impaired (change to Not Impaired recommended)
Requires Further Assessment		
3b	Degradation of Wildlife Populations	Requires Further Assessment (change to Not Impaired recommended)
Not Impaired		

5	Bird and Animal Deformities or Reproductive problems	Not Impaired (2016)
8	Eutrophication or Undesirable Algae	Not Impaired (2018)
10	Beach Closings	Not Impaired (2018)
11	Degradation of Aesthetics	Not Impaired (2018)
Never Impaired		
1b	Restrictions on Wildlife Consumption	Never Impaired
2	Tainting of Fish and Wildlife Flavour	Never Impaired
9	Restrictions on Drinking Water Consumption or Taste and Odour Problems	Never Impaired
12	Added Cost of Agriculture and Industry	Never Impaired
13	Degradation of Phytoplankton and Zooplankton	Never Impaired

2.2 Summary of Beneficial Use Impairments

2.2.1 Re-designated Beneficial Use Impairments

Since the Stage 1 RAP report (1992), four BUIs have been re-designated to a "not impaired" status. The BUIs, along with the rationale supporting their re—designations are discussed below.

(i) Bird and Animal Deformities or Reproductive Problems (BUI #5)

Status: NOT IMPAIRED

Re-designation Date: January 2016

Delisting Criteria: Delisting criteria were not required, given this BUI was designated as "requires further assessment" (i.e. needed to determine whether this BUI was impaired or not).

Background: *Bird and Animal Deformities or Reproductive Problems* was never deemed "impaired" for the AOC, but rather required further assessment in the Stage 2 RAP report (2002). No deformities were noted in wildlife along the St. Marys River other than three cross-bill common tern chicks observed on Lime Island in 1998. Due to the fact that a full assessment of bird and animal populations had not been conducted at the time of the creation of the Stage 2 RAP report, it was deemed that further assessment was required.

Reason for Re-designation: The official re-designation to "not impaired" is based on four years of study by Environment and Climate Change Canada's (ECCC's) Ecotoxicology and Wildlife Health Division. The assessment report (2014) concluded that there is no

evidence of impairment in colonial water birds attributable to local contamination effects within the AOC, and the reproductive success for birds studied within the AOC is similar to that from outside the AOC. Key findings include:

- No physical deformities detected in herring gull or common tern chicks or adults.
- Low incidence of embryonic deformities that cannot be linked to contaminant burdens or to geographical area (i.e., there is no significant difference between AOC and non-AOC bird colonies).
- Contaminant levels are low overall, and not sufficiently elevated to have an adverse impact on reproductive success and development. This is the case for polychlorinated biphenyls (PCBs) and other organochlorines, dioxins/furans, heavy metals like mercury, and polybrominated diphenyl ethers (PBDEs).
- Reproductive success for herring gulls within the AOC is high, and that of the common tern is similar to the rest of the region.

Supporting Reports:

Chambers, M., K. Hughes, D. Crump, K. Williams, and P. Martin. 2014. Beneficial Use Impairment Redesignation: *Bird and Animal Deformities or Reproductive Problems*. St. Marys River Area of Concern (Canadian Section). Environment Canada. 41 pp. Available here: http://bpac.algomau.ca/wp-content/uploads/2015/09/BUI-Redesignation-Report-SMR-Bird-Animal-Deformities-Dec-12-2014.pdf

Table 3: Accomplished Actions for *Bird and Animal Deformities or Reproductive Problems* (BUI #5)

Remedial Actions and Monitoring Initiatives		Status
FFM-5	The CWS surveys of the Common and Black Tern populations	Completed in 2014
FFM-6	Analysis of contaminant levels in eggs	Completed in 2014
FFM-8	Reproductive assessment of gulls and terns	Completed in 2014

(ii) Eutrophication or Undesirable Algae (BUI #8)

Status: NOT IMPAIRED

Re-designation Date: October 2018

Delisting Criteria: *This beneficial use will no longer be impaired when comprehensive tests of the Area of Concern's water quality demonstrate the river is free from persistent or reoccurring problems associated with oxygen stress (eutrophication) and large algal blooms, as determined through a comparison to established guidelines for the relevant physical and chemical parameters.*

Background: *Eutrophication or Undesirable Algae* was identified "impaired" in both the Stage 1 RAP (1992) and Stage 2 RAP (2002) reports. The Stage 1 RAP report identified localized impairments due to the presence of algae floating over slow-moving portions of the river and within embayments. Large algal mats were reported floating downstream of the East End Wastewater Treatment Plant. At the time of the Stage 2 RAP report, eutrophication and algae continued to be an issue in the vicinity of the East End Wastewater Treatment

Figure 6: Algae growing on a rock.

Reason for Re-designation: The official re-designation to "not impaired" is based on a three-year water quality monitoring study by Algoma University. Analysis of the monitoring data concludes conditions that originally led to the beneficial use being designated as "impaired" no longer exist and the delisting criteria was met. In particular, there was no evidence of oxygen stress, large quantities of algae, or high levels of nutrients typically found in culturally-eutrophic waters.

Supporting Reports:

SMR RAP Team, 2018. *Degradation of Aesthetics and Eutrophication or Undesirable Algae*: Recommendation to designate these Beneficial Use Impairments as Not Impaired for the St. Marys River Area of Concern (Canadian section). Available here: http://bpac.algomau.ca/wp-content/uploads/2016/09/Water-Quality-Technical-Report-2013-15_Aug-2016.pdf

Table 4: Accomplished Actions for *Eutrophication or Undesirable Algae* (BUI #8)

Remedial Actions and Monitoring Initiatives		Status
PS-3	Upgrade EEWWTP to secondary treatment	Completed in 2006
NPS-6	Control of agricultural and other non-point sources of pollution	Completed in 2016
NPSM-8	Monitor non-point sources of pollution in the AOC	Completed in 2016

(iii) Beach Closings (BUI #10)

Status: NOT IMPAIRED

Re-designation Date: October 2018

Delisting Criteria: *This beneficial use will no longer be impaired when: i) stormwater infiltration is reduced to help prevent sewage treatment bypasses, and a Stormwater Management Master Plan is completed and being implemented by the City of Sault Ste. Marie that outlines the preferred solution for managing stormwater quantity and quality; ii) the East End Water Pollution Control Plant is upgraded to secondary treatment; and iii) potential human health risks resulting from floating material near and downstream of Bellevue Marine Park are assessed and managed, as required*.

Background: Beach Closings was identified "impaired" in both the Stage 1 RAP (1992) and Stage 2 RAP (2002) reports because *E. coli* bacterial densities were reported to be in excess of the Provincial Water Quality Objective. These exceedances were reported in waters downstream of storm sewers and the East End Wastewater Treatment Plant.

Reason for Re-designation: The official re-designation to "not impaired" is based on the completion of remedial actions identified in the Stage 2 RAP report for the Beach Closings BUI for which the delisting criteria focused on. This includes:

(i) The development of a stormwater management plan for the City of Sault Ste. Marie,
(ii) East End Wastewater Treatment Plan upgrades; and
(iii) Confirmation that the floating masses observed in the vicinity of Bellevue Marine Park are predominantly comprised of algae, detritus and pollen, and not a significant source of *E. coli* bacteria.

In addition, a multi-year beach water quality assessment was completed in 2016. Results from this study conclude there are no major anthropogenic sources of bacterial contamination on the Canadian side of the St. Marys River, and that the water quality within the AOC and its beaches are comparable to non-AOC areas.

Figure 7: East End Wastewater Treatment Plant Upgrades

Supporting Reports:

Derickx, L. 2017. St. Marys River Area of Concern (Canadian Section) Beneficial Use Impairment Re-designation Report: *Beach Closings*. Algoma University. 27 pp. Available here: http://bpac.algomau.ca/wp-content/uploads/2018/01/St.-Marys-River-Beach-Closings-Redesignation-Report_Final.pdf

Table 5: Accomplished Actions for *Beach Closings* (BUI #10)

Remedial Actions and Monitoring Initiatives		Status
PS-2	Reduce stormwater infiltration at the EEWWTP	Ongoing
PS-3	Upgrade EEWWTP to secondary treatment	Completed in 2006
NPSM-7	Assess potential health risks resulting from floating contaminated masses	Completed in 2010

(iv) Degradation of Aesthetics (BUI #11)

Status: NOT IMPAIRED

Re-designation Date: October 2018

Delisting Criteria: *This beneficial use will no longer be impaired when comprehensive tests of the Area of Concern's water quality demonstrate the river is devoid of any substances that produce a persistent objectionable deposit, unnatural colour or turbidity, or unnatural odour, and is free from persistent or reoccurring problems associated with degraded aesthetics.*

Figure 8: Sample Jars for water testing

Background: *Degradation of Aesthetics* was identified "impaired" in both the Stage 1 RAP (1992) and Stage 2 RAP (2002) reports. Floating scum and mats of oily fibrous material mixed with wood chips were occasionally observed between the city of Sault Ste. Marie and the Lake George Channel. At the time of the Stage 2 RAP report, aesthetic impairment continued to be an issue downstream of the East End Wastewater Treatment Plant.

Reason for Re-designation: The official re-designation to "not impaired" is based on a three-year water quality monitoring study by Algoma University. Analysis of the monitoring data confirms that the conditions that originally led to the beneficial use being designated as impaired no longer exist and the delisting criteria was met. In particular, there was an absence of characteristics associated with degraded aesthetics with no objectionable deposits, unnatural colour, unnatural turbidity, or unnatural odour.

Supporting Reports:

SMR RAP Team, 2018. *Degradation of Aesthetics* and *Eutrophication or Undesirable Algae*: Recommendation to Designate these Beneficial Use Impairments as Not Impaired for the St. Marys River Area of Concern (Canadian section). Available here: http://bpac.algomau.ca/wp-content/uploads/2016/09/Water-Quality-Technical-Report-2013-15_Aug-2016.pdf

Table 6: Accomplished Actions for *Degradation of Aesthetics* (BUI #11)

Remedial Actions and Monitoring Initiatives		Status
PS-4	Relocate discharge pipe at EEWWTP	Completed in 2006
PS-9	Algoma Steel to limit dischargers from its dekish operation	Completed in 2014
FF-9	Stabilize shoreline of the Algoma Slag Dump	Completed in 2010
PSM-2	The Sault Ste. Marie, Michigan, air quality monitoring project	Not Applicable – Michigan Action
PSM-4	The Sault Ste. Marie, Ontario, air quality monitoring project	Addressed
PSM-5	Monitoring for particulate emissions at Algoma's dekish operation	Addressed

2.2.2 Beneficial Use Impairments Requiring Further Assessment

Since the Stage 1 RAP report (1992), one BUI remains in a state of requiring further assessment before it can be re-designated to a "not impaired" status. This BUI is discussed below.

(i) Degradation of Wildlife Populations (BUI #3b)

Status: REQUIRES FURTHER ASSESSMENT (Change to NOT IMPAIRED recommended)

Delisting Criteria: Delisting criteria are not required, given this requires further assessment to determine impairment or not.

Background: The wildlife portion of the *Degradation of Fish and Wildlife Populations* BUI was designated as "requires further assessment" in the Stage 2 RAP report (2002) due to a lack of assessment and documentation indicating impairment, or not. However, there was an assumption at the time that habitat loss and chemical contaminants could be having a negative impact on wildlife populations.

In 2014, ECCC completed a wildlife population assessment for common terns and black terns based on nest count surveys conducted between 2010 and 2013, supplemented with historical breeding data from 1978-80, 1989, 1999-00, and 2007-08 (Hughes et al. 2014). Population trends for colonial waterbirds breeding on the North Channel of Lake Huron were included to provide a broader context of trends in diversity and abundance within the AOC. The study concluded commons terns and black terns are breeding within the AOC, that there is no evidence that breeding status within the AOC differs from that outside of AOC, and that nesting and population patterns are influenced by life history strategies of the species and factors that are regional or basin-wide in nature, and not specific to influences within the AOC.

In parallel to the above-mentioned assessment of common tern and black tern populations within the AOC, in 2014, ECCC also completed its three-year common tern and herring gull study based on fieldwork and laboratory analysis to assess deformities, reproductive health, and chemical contamination in eggs of these indicator species. The report concludes that there is no evidence of impaired reproduction or deformities in colonial waterbirds attributable to local contamination effects within the AOC, and the reproductive success for birds studied within the AOC is similar to that from outside the AOC.

Based upon the above-mentioned studies, a change to "not impaired" is recommended for the wildlife portion of this BUI. The fish portion remains in a state of impairment, pending the completion of an evaluation on the current condition that is underway. Discussion on the fish component of the BUI is presented under section 2.2.3 below. This BUI will not be fully re-designated until all elements of the delisting criteria have been met.

Supporting Reports:

Derickx, L. 2018. Beneficial Use Impairment Status Report: Degradation of Wildlife Populations and Loss of Wildlife Habitat. St. Marys River Area of Concern (Canadian Section). Algoma University. 26 pp. Available here: http://bpac.algomau.ca/wp-content/uploads/2019/06/St-Marys-River-AOC-Wildlife-Redesignation-Report-2018.pdf

Table 7: Accomplished Actions for *Degradation of Wildlife Populations* (BUI #3b)

Remedial Actions and Monitoring Initiatives		Status
FFM-5	The CWS surveys of the Common and Black Tern populations	Completed in 2014
FFM-6	Analysis of contaminant levels in eggs	Completed in 2014

2.2.3 Remaining Beneficial Use Impairments

There are currently 6 BUIs that are considered "impaired" for the St. Marys River AOC. These BUIs are discussed below along with rationale for their impairment and actions recommended for re-designation.

(i) Restrictions on Fish and Wildlife Consumption (BUI #1)

Status: IMPAIRED (fish); NOT IMPAIRED (wildlife)

Background: *Restrictions on Fish Consumption* are assessed through the MECP's Fish Contaminant Monitoring Program. Consumption advisories for the St. Marys River

have generally been based on mercury, polychlorinated biphenyls (PCBs), dioxins/furans, and dioxin-like PCBs.

Delisting Criteria: *This beneficial use will no longer be impaired when the fish consumption advisories in the Area of Concern are no more restrictive than the advisories for the same contaminants in suitable reference sites. Comparisons shall be based on samples collected in the same timeframe for a minimum of two consecutive sampling events.*

Table 8: Accomplished Actions for *Restrictions on Fish and Wildlife Consumption* (BUI #1)

Remedial Actions and Monitoring Initiatives		Status
PS-1	Virtual elimination of all persistent and bioaccumulative contaminants	Ongoing
NPSM-2	Aerial monitoring of Cannelton Industries site	Not Applicable – Michigan Action
NPSM-3	Biological monitoring at the Cannelton Industries site	Not Applicable – Michigan Action

Table 9: Remaining Actions for *Restrictions on Fish and Wildlife Consumption* (BUI #1)

Remedial Actions and Monitoring Initiatives		Status
FFM–4	The fish contaminant monitoring programs	Underway

Additional Actions (ie. not listed in Stage 2 RAP report but required for re-designating the BUI)

- Awaiting results from MECP Fish Contaminant Monitoring Program.
- A fish consumption survey will need to be conducted to confirm the assumption that consumption of 8^{+} meals per month can be considered non-restrictive to inform the status of this BUI.
- Prepare a status report and recommend status of BUI based on delisting criteria and three-tier approach.
    - If a “not impaired” status results, present recommendation to BPAC, stakeholders and Indigenous Communities to officially re-designate BUI
    - If an “impaired” status results, identify next steps required to re-designate

(ii) Degradation of *Fish Populations* (BUI #3a)

Status: IMPAIRED, (Pending possible re-designation to NOT IMPAIRED)

Background: For the St. Marys River AOC, the concern raised in the Stage 1 and 2 RAP reports outlined that native fish populations were being stressed by habitat alteration,

over-fishing, pollution, and invasive species. This BUI is based on fish population dynamics and assessed whether local environmental conditions support healthy, self-sustaining communities of fish.

Delisting Criteria*: This beneficial use will no longer be impaired when the overall fish community health within the Area of Concern is comparable to that of a suitable reference site, as assessed using an index of biotic integrity through a minimum of two consecutive studies.*

In 2009 and 2014, the Department of Fisheries and Oceans Canada compared the status of nearshore fish communities within the AOC to reference sites, and provided an overall assessment of the nearshore fish community using an Index of Biotic Integrity (IBI) approach. The studies concluded that the overall health of the nearshore fish community in the St. Marys River AOC compare favourably with healthy reference sites, and that the AOC is considered to have good biotic integrity. To further examine deeper water fish communities, the RAP Team is reviewing results from a Population Dynamics study and river-wide creel survey. Combined with DFO's nearshore fish community assessment, this will provide a broad perspective in assessing the overall Fish Populations beneficial use impairment.

Figure 9: Fish in a culvert at Whitefish Island

Table 10: Accomplished Actions for *Degradation of Fish Populations* (BUI #3a)

Remedial Actions and Monitoring Initiatives		Status
PS-1	Virtual elimination of all persistent and bioaccumulative contaminants	Ongoing
NPS-4	Identification and control of contaminants from the Algoma Slag Dump	Completed in 2010
NPS-7	Remediation of contaminated terrestrial and aquatic disposal sites	Addressed
FF-7	Develop a 10 year Fisheries Assessment Program for the river	Completed in 2002
FF-8	Continued support for Sea Lamprey control efforts	Addressed
FFM-3	The fish harvest survey	Completed in 2019

PSM-6	Monitoring receiving water at St. Marys Paper	No Longer Applicable
PSM-8	Monitoring study of contaminant discharges from wastewater treatment plants	Addressed
NPSM-2	Aerial monitoring of Cannelton Industries site	Not Applicable – Michigan Action
NPSM-3	Biological monitoring at the Cannelton Industries site	Not Applicable – Michigan Action
NPSM-9	Identify terrestrial and aquatic disposal sites transferring contaminants into waterways	Addressed
NPSM-11	Assess the potential hazards associated with spills from shipping vessels	Completed in 2013

Table 11: Remaining Actions for *Degradation of Fish Populations* (BUI #3a)

Remedial Actions and Monitoring Initiatives		Status
NPS-1	Development of a multi-agency sediment management plan	Underway
FFM-7	Monitoring of population changes due to habitat enhancement	Pending

Additional Actions

- Work with the SMRFTG to determine the overall health of the fish community in the St. Marys River AOC (i.e. utilize the Nearshore Fish Community, Fish Community Population Dynamics and Creel Reports).
- Prepare a status report and recommend status of BUI based on delisting criteria (2019)
    - If a "not impaired" status results, present recommendation to BPAC, stakeholders and Indigenous Communities to officially re-designate BUI
    - If an "impaired" status results, identify next steps required to re-designate

(iii) Fish Tumours or Other Deformities (BUI #4)

Status: IMPAIRED

Background: This BUI was designated *impaired* for the St. Marys River AOC after 185 white suckers sampled from 1985-90 exhibited a tumour prevalence rate of 9.2%. In 2012, Fisheries and Oceans Canada completed tumour diagnoses for white suckers collected in 2009 and found that tumour rates remained elevated at 10.6%. In both cases, the likely cause was deemed to be exposure to polycyclic aromatic hydrocarbons (PAHs) within the river sediment. In 2015, analysis of 100 white suckers revealed a tumour rate of 6%. This is a marked improvement from the higher rates detected in the

past, but remains above the 5% threshold the Great Lakes Commission established as an indicator of environmental degradation.

Delisting Criteria: *This beneficial use will no longer be impaired when a survey from within the Area of Concern of a locally abundant member of the sucker family, encompassing a diverse age range, indicates a liver tumour prevalence rate of less than 5%.*

Table 12: Accomplished Actions for *Fish Tumours or Other Deformities* (BUI #4)

Remedial Actions and Monitoring Initiatives		Status
PS-1	Virtual elimination of all persistent and bioaccumulative contaminants	Ongoing
PS-7	Encourage major point source dischargers to continue process improvements	Completed in 2012
NPS-4	Identification and control of contaminants from the Algoma Slag Dump	Completed in 2005
NPSM-9	Identify terrestrial and aquatic disposal sites transferring contaminants into waterways	Addressed
FFM-2	Identify the causes of fish tumours and other deformities which originate within the AOC	Completed in 2018

Table 13: Remaining Actions for *Fish Tumours or Other Deformities* (BUI #4)

Remedial Actions and Monitoring Initiatives		Status
NPS-1	Development of a multi-agency sediment management plan	Underway
NPS-5	Evaluation of Algoma Slip sediment and implementation of clean-up	Underway

Additional Actions

- Complete a follow-up fish tumour survey in 2021 or 2022.
- Based on survey results, prepare a status report and recommend status of BUI based on delisting criteria
    - If a “not impaired” status results, present recommendation to BPAC, stakeholders and Indigenous Communities to officially re-designate BUI
    - If an “impaired” status results, identify next steps required to re-designate

(iv) Degradation of Benthos (BUI #6)

Status: IMPAIRED

Background: In the Stage 1 RAP report (1992), the *Degradation of Benthos* BUI was divided into 2 parts: (i) Dynamics of benthic populations (ie. Benthic macroinvertebrate communities are impaired along the Ontario shore downstream of the Algoma Steel, St. Marys Paper and East End Waste Water Treatment Plant as evidenced by the presence of pollution tolerant species and low diversity) and (ii) Body burdens of benthic organisms (ie. The original impetus for this BUI being deemed impaired was the exceedance of the Severe Effect Level for polycyclic aromatic hydrocarbons (PAHs) in several locations in the St. Marys River; for iron at several sites; and for arsenic, nickel and manganese at the Algoma Steel slag yard.

Delisting Criteria: *The Degradation of Benthos BUI will no longer be impaired when: (i) The contaminated sediment in the Algoma Boat Slip has been removed from the area through dredging, and monitoring data indicates concentrations of total PAHs (polycyclic aromatic hydrocarbons) in any residual sediment is less than 115 ppm (parts per million); and (ii) Assessments using multiple lines of evidence (sediment chemistry, benthic community alteration, toxicity, and biomagnification potential) on the area east of Bellevue Marine Park and the "Transport Canada Site" conclude negligible environmental risk requiring no further action, as demonstrated under the Canada-Ontario Decision Making Framework for Assessment of Great Lakes Contaminated Sediment. If there is environmental risk requiring management actions, evidence of successful implementation of management action – as indicated by improving trends over three monitoring cycles – will be required for BUI re-designation.* – DRAFT Criteria

Table 14: Accomplished Actions for *Degradation of Benthos* (BUI #6)

Remedial Actions and Monitoring Initiatives		Status
NPS-3	Completion of the St. Marys River contaminated sediment zones evaluation	Completed in 2015
PSM-1	Long-term water monitoring at the Cannelton Industries site	Not Applicable – Michigan Action
PSM-6	Monitoring receiving water at St. Marys Paper	No Longer Applicable
NPSM-1	Monitoring EEWWTP and identification of upstream sources	No Longer Applicable
NPSM-3	Biological monitoring at the Cannelton Industries site	Not Applicable – Michigan Action
NPSM-6	Benthic, toxicity, and sediment chemistry studies at BMP	Completed in 2010

Table 15: Remaining Actions for Degradation of Benthos (BUI #6)

Remedial Actions and Monitoring Initiatives		Status
NPS-1	Development of a multi-agency sediment management plan	Underway

NPS-2	Further characterize sediment quality in several high priority areas	Underway
NPS-5	Evaluation of Algoma Slip sediment and implementation of clean-up	Underway
NPSM-5	Re-sampling of river sediments to obtain trend information	Underway

Additional Actions

- Assess the potential cause of toxicity in St. Marys River sediments east of Bellevue Marine Park
- Complete Sediment Management Strategy
- Develop delisting criteria in parallel with the Sediment Management Strategy
- Identify next steps required to re-designate

(v) Restrictions on Dredging Activities (BUI #7)

Status: IMPAIRED, (Change to NOT IMPAIRED recommended)

Background: This BUI is focused on contaminated sediment and applies to specific cases where commercial-navigational dredging is routinely required but is considered *impaired* when contaminants are above concentrations that permit open water disposal. It is the additional financial cost associated with disposing the contaminated dredgate on land, instead of freely in the open waters, which is considered the impaired beneficial use. Regardless, open water disposal does not happen on the Canadian side of the St. Marys River. Doing so can affect aquatic communities and habitat by smothering the area and introducing different types.

Delisting Criteria: *This beneficial use will no longer be impaired when administrative controls and other regulatory procedures are in place within the Area of Concern that provide guidance and oversight for dredging proponents and permitting agencies in the planning and undertaking of dredging activities, including mitigating measures to reduce negative impacts. Such guidance will be made clear in a multi-agency Dredging Administrative Controls document that will be part of a broader sediment management plan for the Area of Concern.*

Recommendation to re-designate is based upon the completion of the multi-agency sediment management strategy, at which point the delisting criteria will be fulfilled and no further action will be warranted. This recommendation is based on the following:

- The St. Marys River Dredging Administrative Controls Document (Derickx, 2016) has been created to provide guidance and oversight for dredging proponents and permitting agencies in the planning and undertaking of dredging activities.
- The multi-agency sediment management strategy for the St. Marys River AOC is underway.

- The two recommendations listed in the Stage 2 RAP (Actions NPS-1 and NPS-5) report are underway.

Table 16: Accomplished Actions for *Restrictions on Dredging Activities* (BUI #7)

Remedial Actions and Monitoring Initiatives		Status
NPSM-3	Biological monitoring at the Cannelton Industries site	Not Applicable – Michigan Action

Table 17: Remaining Actions for Restrictions on Dredging Activities (BUI #7)

Remedial Actions and Monitoring Initiatives		Status
NPS-1	Development of a multi-agency sediment management plan	Underway
NPS-5	Evaluation of Algoma Slip sediment and implementation of clean-up	Underway
NPSM-4	Task team monitoring recommendations	Underway

Additional Actions

- Continue to promote and communicate the St. Marys River Ontario Dredging Administrative Controls document to dredging proponents and permitting agencies.
- Continue seeking AOC community review on the BUI assessment and re-designation report (first drafted in 2018). Final report will account for feedback received.
- Complete Sediment Management Strategy

(vi) Loss of Fish Habitat (BUI #14a)

STATUS: IMPAIRED

Background: The Stage 1 and 2 RAP reports identify shoreline alteration, industrialization and urbanization, shipping activities, and shoreline cottage development as having caused significant loss in both fish and wildlife habitat along the river; particularly around the city of Sault Ste. Marie.

Delisting Criteria: *This beneficial use will no longer be impaired when: (i) coastal wetland wildlife habitat conditions within the Area of Concern are comparable to those of suitable reference sites, as assessed using an index of biotic integrity;* ***(ii) rapids habitat conditions are enhanced through feasible conservation and restoration measures identified in the Stage 2 Remedial Action Plan; and (iii) the closely linked Degradation of Fish Populations BUI is no longer deemed impaired.****

*This set of delisting criteria pertains to the loss of both fish and wildlife habitat. Only delisting criterion (ii) and (iii) pertain to the loss of fish habitat specifically.

Table 18: Accomplished Actions for *Loss of Fish Habitat* (BUI #14a)

Remedial Actions and Monitoring Initiatives		Status
NPS-6	Control of agricultural and other non-point sources of pollution	Completed in 2014
NPS-7	Remediation of contaminated terrestrial and aquatic disposal sites	Addressed
FF-1	Bar River habitat project	Completed in 2013
FF-4	Sedimentation reduction in the Munuscong River/Bay	Not Applicable – Michigan Action
FF-5	Characterization/feasibility study for waste removal in Mission Creek	Not Applicable – Michigan Action
FF-7	Develop a 10 year Fisheries Assessment Program for the river	Completed in 2002
FF-8	Continued support for Sea Lamprey control efforts	Addressed
FF-9	Stabilize shoreline of the Algoma Slag Dump	Completed in 2010
PSM-1	Long-term water monitoring at the Cannelton Industries site	Not Applicable – Michigan Action
NPSM-3	Biological monitoring at the Cannelton Industries site	Not Applicable – Michigan Action
NPSM-9	Identify terrestrial and aquatic disposal sites transferring contaminants into waterways	Addressed
NPSM-11	Assess the potential hazards associated with spills from shipping vessels	Completed in 2013
FFM-2	The marsh monitoring program	Completed in 2016
FFM-9	Evaluate influence of water levels and flows on spawning and production	Addressed
FFM-10	Determine minimum water levels and flows rates necessary for spawning	Addressed
FFM-11	Monitoring water quantity	Addressed

Table 19: Remaining Actions for Loss of Fish Habitat (BUI #14a)

Remedial Actions and Monitoring Initiatives		Status
FF-2	Watershed development plan for Bennett and West Davignon Creeks	Under Review
FF-3	Watershed development plan for the East Davignon and Fort Creeks etc.	Under Review
FF-6	Remediation of rapids habitat and associated wetlands	Underway

FFM-7	Monitoring of population changes due to habitat enhancement	Pending

Additional Actions

- Actions FF-2 and FF-3 are "Under Review". Consult with the Sault Ste. Marie Region Conservation Authority to determine whether any habitat enhancements along tributaries leading to the St. Marys River are feasible and clearly linked to the BUI delisting criteria.
  - If feasible, determine next steps and possible organizations capable of undertaking potential projects.
  - If not feasible, change status to "Not Applicable"

(vii) Loss of Wildlife Habitat (BUI #14b)

Status: IMPAIRED, (Change to NOT IMPAIRED recommended)

Delisting Criteria: *This beneficial use will no longer be impaired when: (i)* ***coastal wetland wildlife habitat conditions within the Area of Concern are comparable to those of suitable reference sites, as assessed using an index of biotic integrity****; (ii) rapids habitat conditions are enhanced through feasible conservation and restoration measures identified in the Stage 2 Remedial Action Plan; and (iii) the closely linked Degradation of Fish Populations BUI is no longer deemed impaired.*

Recommendation to re-designate is based on a five-year monitoring effort by ECCC's Canadian Wildlife Service and its 2016 study report. The study assessed baseline wildlife habitat conditions and evaluated coastal wetland water quality, and breeding bird, amphibian, aquatic macroinvertebrate and submerged vegetation communities within the AOC, concluding the wildlife habitat and populations are not impaired. Key findings include:

- Water quality within the AOC's coastal wetlands is comparable to non-AOC reference sites; suggesting overall water quality can be considered not impaired. Algoma University's water quality survey (2013-15) supports this conclusion (Ginou 2016).
- Breeding marsh birds in the AOC are in relatively undisturbed condition, and sites inside and outside the AOC are in comparable condition; suggesting there is no impairment.
- There is no clear changes within the amphibian and aquatic macroinvertebrate communities, suggesting those populations are not impaired.
- There are some differences between submerged aquatic vegetation communities in the AOC versus non-AOC reference sites, but the overall area is not impaired for this community type.

Figure 10: Wetland at Whitefish Island

Based on the above-mentioned study, a change to "not impaired" is recommended for the wildlife portion of this BUI. The fish portion remains in a state of impairment, pending the completion of remedial actions and an evaluation on the current conditions. This BUI will not be fully re-designated until all elements of the delisting criteria have been met.

Supporting Reports:

Darwin, A. 2016. St. Marys River Area of Concern: Coastal Wetland Habitat Assessment Report. Environment and Climate Change Canada – Canadian Wildlife Service. 40 pp. Available here: http://bpac.algomau.ca/wp-content/uploads/2016/12/CWS-SMR-Coastal-Wetland-Assessment-Final-Report-Aug-20161.pdf

Derickx, L. 2018. Beneficial Use Impairment Status Report: Degradation of Wildlife Populations and Loss of Wildlife Habitat. St. Marys River Area of Concern (Canadian Section). Algoma University. 26 pp. Available here: http://bpac.algomau.ca/wp-content/uploads/2019/06/St-Marys-River-AOC-Wildlife-Redesignation-Report-2018.pdf

Table 20: Accomplished Actions (i.e. completed, addressed, ongoing, not applicable) for Loss of Wildlife Habitat (BUI #14b)

Remedial Actions and Monitoring Initiatives		Status
FFM-2	The marsh monitoring program	Completed in 2016

3.0 Remaining Stage 2 Actions

Restoring beneficial uses in the St. Marys River AOC requires a cooperative effort aimed at reducing impacts on the ecosystem and rehabilitating historically degraded sites. The Stage 2 RAP report outlines recommended actions to help achieve the goal of beneficial use restoration. These actions are recommendations and may not necessarily be required to meet the delisting criteria for individual BUIs.

3.1 Action NPS-1: Development of a multi-agency sediment management plan

Overview: The development of a multi-agency sediment management plan, including a wide scope of planning, remediation, and monitoring activities is described in the sub-sections below.

Status: Underway

Applicable BUIs: Degradation of Fish and Wildlife Populations, Fish Tumours or Other Deformities, Degradation of Benthos, Restrictions on Dredging Activities

Work completed, underway or remaining to complete action:

This action includes both short and long-term activities ranging from the assessment of immediate remedial options to the implementation of management actions. As such, there are ten sub-actions listed in the Stage 2 RAP report that support the development of the sediment management strategy.

(a) Sediment mapping of the St. Marys River AOC (Complete)

(b) Development of a decision-making framework (Complete)

(c) Identify suitable management actions (Underway)

→ This sub-action deals with identifying suitable management actions that can be incorporated into the final Sediment Management Strategy for the AOC. A Conceptual Site Model (CSM) is being updated that will result in one of three potential conclusions. If the first conclusion is reached (i.e. sufficient evidence exists to conclude that current conditions in the AOC do not pose a significant risk to human health and/or the environment), no further action will be required. If the second conclusion is reached (i.e. there is insufficient evidence

that exists to draw conclusions regarding human health and/or the environment), the CSM will conclude with recommendations for further investigation to support a more detailed and accurate evaluation of risks. If the third conclusion is reached (i.e. there is sufficient evidence to conclude that current conditions pose a significant risk to human health and the environment), the CSM will conclude with recommendations for further investigation to support sediment management options analysis or with the recommendation to proceed with a sediment management options analysis.

(d) Prevent additional accumulation of contaminants (Underway)

→ Substantial progress has been made in implementing source control measures and through MECP regulation of major point sources. The updated CSM will provide a qualitative review to determine whether contaminant sources may be sufficiently controlled to permit effective sediment management.

(e) Monitoring program for major dischargers (Complete)

(f) Monitoring and control during sediment remediation activities (Pending)

→ This sub-action is pending and depends on the management actions taken under the Sediment Management Strategy.

(g) Track atmospheric inputs (Not Applicable)

→ This sub-action is beyond the scope of the AOC and the RAP program. Atmospheric inputs are already addressed under a number of other programs (ie. Lake Superior and Lake Huron Lakewide Action and Management Plans and in particular federal and provincial regulations with respect to domestic sources of atmospheric emissions).

(h) Monitoring and remediation of the Sediment Management Strategy (Pending)

→ This sub-action is pending and depends on the management actions taken under the Sediment Management Strategy.

(i) Incorporate benefits of advancing technology (Pending)

→ This sub-action is pending and depends on the management actions taken under the Sediment Management Strategy.

(j) Coordinate monitoring and remediation activities with Lake Huron LAMP (Pending)

→ This sub-action is pending and depends on the management actions taken under the Sediment Management Strategy.

3.2 Action NPS-2: Further characterize sediment quality in several high priority areas

Overview: While there is sufficient amount of information about sediment quality in a number of areas, it was recommended to further characterize several high priority areas including the area East of Bellevue Marine Park.

Status: Underway

Applicable BUIs: Degradation of Benthos

Work completed, underway or remaining to complete action:

- Information from the 2018 BEAST, coring and invertebrate toxicity work completed in 2018 is currently being incorporated in the updated Conceptual Site Model.

3.3 Action NPS-5: Evaluation of Algoma Slip sediment and implementation of clean-up

Overview: The Stage 2 RAP report recommended that the sediment quality and quantity within the Algoma Boat Slip required evaluation and remediation.

teel Boat Slip
Steel)

Status: Underway

Applicable BUIs: Fish Tumours or Other Deformities, Degradation of Benthos, Restrictions on Dredging Activities

Work needed to complete action:

Algoma Steel is awaiting results from a 2019 post dredge sediment assessment. The company has also initiated a hydrological investigation into any ongoing sources of contamination to the slip, which started in 2019.

3.4 Action FF-2: Watershed development plan for Bennett and West Davignon Creeks

Overview: Identify specific remedial options to address habitat components and outline preventative measures to help protect the watershed.

Status: Under Review

Applicable BUIs: Loss of Fish and Wildlife Habitat

Work completed, underway or remaining to complete action:

- The status of this action is currently under review as the tributaries themselves are not within the AOC.
- A tributaries report was drafted in 2017 by Algoma University suggesting possible areas where habitat improvements can be made. Algoma University has consulted with the SSMRCA to determine the feasibility of improving habitat along these channels. SSMRCA is willing to allow certain habitat improvements to be implemented by other organizations as long as it does not impede flood flows resulting in public safety concerns.

3.5 Action FF-3: Watershed development plan for the East Davignon and Fort Creeks etc.

Overview: Identify specific remedial options to address habitat components and outline preventative measures to help protect the watershed.

Status: Under Review

Applicable BUIs: Loss of Fish and Wildlife Habitat

Work completed, underway or remaining needed to complete action:

- The status of this action is currently under review as the tributaries themselves are not within the AOC.
- A tributaries report was drafted in 2017 by Algoma University suggesting possible areas where habitat improvements can be made. Algoma University has consulted with the SSMRCA to determine the feasibility of improving habitat along these channels. SSMRCA is willing to allow certain habitat improvements to be implemented by other organizations as long as it does not impede flood flows resulting in public safety concerns.

3.6 Action FF-6: Remediation of rapids habitat and associated wetlands

Overview: Creation of wetlands in association with existing rapids.

Status: Underway

Applicable BUIs: Loss of Fish and Wildlife Habitat

Work completed, underway or remaining to complete action:

- In 2018-19, ECCC, its contractor (Riggs Engineering), and Batchewana First Nation began working to advance proposed aquatic habitat restoration on Whitefish Island. Engineered designs have been produced detailing the options for naturalizing the channel bed and bank areas of the Whitefish Channel and constructing islands and shoals east of Whitefish Island to benefit native fish populations.
- Determine what enhancements will be done and applicable permitting requirements.
- Confirm partnerships and leverage funds.
- Complete project, with a post-construction monitoring plan.

Figure 12: Whitefish Channel

3.7 Action NPSM4: Task team monitoring recommendations

Overview: The Sediment Task Team that is developing the Sediment Management Strategy will provide monitoring recommendations as needed when developing the Sediment Management Strategy.

Status: Underway

Applicable BUIs: Degradation of Benthos, Restrictions on Dredging Activities

Work completed, underway or remaining to complete action:

- Pending until sediment management actions have been determined in the Sediment Management Strategy.

3.8 Action NPSM-5: Re-sampling of river sediments to obtain trend information

Overview: Benthic, toxicity, and sediment chemistry studies should be continued in the Bellevue Marine Park area and at reference locations to confirm and document further water and sediment quality.

Status: Underway

Applicable BUIs: Degradation of Benthos

Work completed, underway or remaining to complete action:

- The CSM has incorporated all studies and knowledge pertaining to benthic, toxicity and sediment chemistry. A toxicity identification evaluation is underway to complete the CSM for the St. Marys River and to provide additional information needed for the development of the Sediment Management Strategy for the AOC.

3.9 Action FFM–4: The fish contaminant monitoring programs

Overview: The Ministry of Environment, Conservation and Parks implements the Fish Contaminant Monitoring Program on the Canadian side of the St. Marys River. Results are used to determine consumption advisories in the AOC.

Status: Underway

Applicable BUIs: Restrictions on Fish Consumption

Work completed, underway or remaining to complete action:

- In 2013, the MECP reviewed the availability of fish contaminant data for the AOC and identified priorities for monitoring. Fish were collected from 2014- 2016 in order to provide an update on contaminant levels in comparison to reference sites. The preliminary results suggest that the levels of contaminants in fish have declined such that the beneficial use can likely be considered "not impaired". A draft report is expected in 2019.

3.10 Action FFM-7: Monitoring of population changes due to habitat enhancement

Overview: This action is to be addressed after fish and wildlife enhancement efforts are implemented. A monitoring program should be developed to assess change in fish and wildlife populations in the AOC in response to these efforts.

Status: Pending

Applicable BUIs: Degradation of Fish and Wildlife Populations, Loss of Fish and Wildlife Habitat

Work completed, underway or remaining to complete action:

- It is anticipated that there will be a post-construction monitoring component of the proposed aquatic habitat restoration project on Whitefish Island being planned in partnership with Batchewana First Nation.

4.0 Work Plan to Address Remaining BUIs

The following is a 5-year work plan identifying actions necessary to re-designate the remaining six BUIs for the Canadian side of the St. Marys River AOC. Re-designation is dependent upon meeting the delisting criteria for each respective BUI.

Status assessments of each BUI will be undertaken in the next five years by the appropriate agency. The draft BUI assessment reports will contain a review of all relevant monitoring data, with input from the RAP steering committee, to determine whether a re-designation to a "not impaired" status is warranted. If so, the recommendation will be presented to BPAC, Indigenous communities and the public (the "AOC community") to allow opportunity for review and comment on the BUI re-designation.

Once all concerns raised during the review process have been addressed, the BUI will be re-designated. If concerns remain, then next steps will be identified by the RAP and as it is unknown what these next steps will be, or how long it will take to implement them, they are marked as going beyond the 5-year work plan with an "X".

Table 21: Work Plan for Re-designating *Restrictions on Fish and Wildlife Consumption* (BUI #1)

Action	Fiscal Year (i.e. April 1 – March 31)						Lead
	19-20	20-21	21-22	22-23	23-24	24-29	
MECP Fish Contaminant Monitoring Program results and draft BUI assessment report to support proposed change to "not impaired".	✓						MECP
Present draft BUI assessment report containing MECP Fish Contaminant Monitoring Program results to BPAC to obtain feedback on moving forward with Indigenous and public engagement (the "AOC community" on BUI re-designation.		✓					MECP
Conduct fish consumption survey of public and Indigenous communities.			✓				MECP, Algoma University
Develop engagement plan for stakeholders and the general public.			✓				MECP
Develop Indigenous engagement plan. Work with Garden River First Nation, Batchewana First Nation and the Métis Nation of Ontario to identify appropriate methods of engagement.			✓				MECP, ECCC, Algoma University

Implement public/stakeholder and Indigenous engagement plans and collect feedback.			✓				MECP
Finalize draft BUI assessment and re-designation report by incorporating feedback collected from public/stakeholder and Indigenous engagement.				✓			MECP
Present final re-designation report to BPAC to obtain feedback on submission to ECCC and MECP for re-designation.				✓			MECP
If support is received, send re-designation report to the Four Agencies (ie. ECCC, MECP, USEPA, EGLE) for review.				✓			ECCC, MECP
Submit re-designation report to COA Annex co-leads and obtain official letter of re-designation.					✓		ECCC, MECP
Public announcement and make final BUI assessment and re-designation report available in digital format.					✓		Algoma University

Table 22: Work Plan for Re-designating *Degradation of Fish and Wildlife Populations* (BUI #3)

Action	Fiscal Year (i.e. April 1 – March 31)						Lead
	19-20	20-21	21-22	22-23	23-24	24-29	
Obtain the following technical reports from the St. Marys River Fisheries Task Group and do necessary analysis/synthesis for BUI assessment report: – Fish Community Populations dynamics – River-wide Creel Report	✓						Algoma University
Prepare BUI re-designation report for evaluation against delisting criteria – If a "not impaired" status results, present draft re-designation report to BPAC to obtain feedback on moving forward with Indigenous and public engagement on BUI re-designation – If an "impaired" status results, identify next steps to re-designate	✓						Algoma University
Develop engagement plan for stakeholders and the general public.	✓						ECCC, MECP, Algoma University

Develop Indigenous engagement plan. Work with Garden River First Nation, Batchewana First Nation and the Métis Nation of Ontario to identify appropriate methods of engagement.	✓						ECCC, MECP, Algoma University
Implement public/stakeholder and Indigenous engagement plans and collect feedback.	✓						ECCC, MECP, Algoma University
Finalize draft BUI assessment and re-designation report by incorporating feedback collected from public/stakeholder and Indigenous engagement.	✓						ECCC, MECP, Algoma University
Present final re-designation report to BPAC to obtain feedback on submission to ECCC and MECP for re-designation.	✓						Algoma University
If support is received, send re-designation report to the Four Agencies (i.e. ECCC, MECP, USEPA, EGLE) for review.	✓						ECCC, MECP
Submit re-designation report to COA Annex co-leads and obtain official letter of re-designation.		✓					ECCC, MECP

Public announcement and make final BUI assessment and re-designation report available in digital format.		✓					Algoma University

Table 23: Work Plan for Re-designating *Fish Tumours or other Deformities* (BUI #4)

Action	Fiscal Year (i.e. April 1 – March 31)						Lead
	19-20	20-21	21-22	22-23	23-24	24-29	
Remediation of Algoma Boat Slip – Dredge remaining contaminated sediment – Conduct a post dredge sediment sampling program to determine remaining status of contamination within the slip		✓					Algoma Steel
Complete Sediment Management Strategy – Draft Sediment Management Strategy – Stakeholder and Indigenous Community review – Finalize Strategy		✓ ✓ ✓					ECCC, MECP
Conduct fourth AOC Fish Tumour Survey – Collect white suckers from the AOC – Analyze liver tumours			✓	✓	✓		ECCC

– Complete AOC fish tumour technical report							
Prepare BUI re-designation report for evaluation against delisting criteria – If a “not impaired” status results, present draft re-designation report to BPAC to obtain feedback on moving forward with Indigenous and public engagement on BUI re-designation – If an “impaired” status results, identify next steps to re-designate					✓	X	ECCC
Develop engagement plan for stakeholders and the general public.					✓		ECCC, MECP, Algoma University
Develop Indigenous engagement plan. Work with Garden River First Nation, Batchewana First Nation and the Métis Nation of Ontario to identify appropriate methods of engagement.					✓		ECCC, MECP, Algoma University
Implement public/stakeholder and Indigenous engagement plans and collect feedback.					✓		ECCC, MECP,

							Algoma University
Finalize draft BUI assessment and re-designation report by incorporating feedback collected from public/stakeholder and Indigenous engagement.					✓		ECCC
Present final re-designation report to BPAC to obtain feedback on submission to ECCC and MECP for re-designation.					✓		ECCC
If support is received, send re-designation report to the Four Agencies (i.e. ECCC, MECP, USEPA, EGLE) for review.					✓		ECCC, MECP
Submit re-designation report to COA Annex co-leads and obtain official letter of re-designation.						✓	ECCC, MECP
Public announcement and make final BUI assessment and re-designation report available in digital format.						✓	Algoma University

Table 24: Work Plan for Re-designating *Degradation of Benthos* (BUI #6)

Action	Fiscal Year (ie. April 1 – March 31)						Lead
	19-20	20-21	21-22	22-23	23-24	24-29	
Update delisting criteria.	✓						ECCC, MECP, Algoma University
Update Conceptual Site Model.	✓						ECCC
Assess the potential cause of toxicity in St. Marys River sediments east of Bellevue Marine Park	✓						Algoma University
Complete Sediment Management Strategy – Draft Sediment Management Strategy – Stakeholder and Indigenous Community review – Finalize Strategy		 ✓ ✓ ✓					ECCC, MECP
Review monitoring data of benthic invertebrate communities to determine if contaminant concentrations in sediments are improving.			✓				ECCC, MECP
	✓						Transport Canada

Obtain a status update of Transport Canada Site and details on chosen sediment management approach.							
Remediation of Algoma Boat Slip – Dredge remaining contaminated sediment – Conduct a post dredge sediment sampling program to determine remaining status of contamination within the slip	✓ ✓						Algoma Steel
Hydrogeological investigation of Algoma Steel property to determine ongoing sources of contamination to the AOC.	✓						Algoma Steel
Prepare BUI re-designation report for evaluation against delisting criteria – If a “not impaired” status results, present draft re-designation report to BPAC to obtain feedback on moving forward with Indigenous and public engagement on BUI re-designation – If an “impaired” status results, identify next steps to re-designate					✓ ✓	X	ECCC, MECP, Algoma University

Develop engagement plan for stakeholders and the general public.						X	ECCC, MECP, Algoma University
Develop Indigenous engagement plan. Work with Garden River First Nation, Batchewana First Nation and the Métis Nation of Ontario to identify appropriate methods of engagement.						X	ECCC, MECP, Algoma University
Implement public/stakeholder and Indigenous engagement plans and collect feedback.						X	ECCC, MECP, Algoma University
Finalize draft BUI assessment and re-designation report by incorporating feedback collected from public/stakeholder and Indigenous engagement.						X	ECCC, MECP, Algoma University
Present final re-designation report to BPAC to obtain feedback on submission to ECCC and MECP for re-designation.						X	ECCC, MECP, Algoma University
						X	ECCC, MECP,

If support is received, send re-designation report to the Four Agencies (i.e. ECCC, MECP, USEPA, MDNR) for review.							Algoma University
Submit re-designation report to COA Annex co-leads and obtain official letter of re-designation.						X	ECCC, MECP, Algoma University
Public announcement and make final BUI assessment and re-designation report available in digital format.						X	ECCC, MECP, Algoma University

Table 25: Work Plan for Re-designating *Restrictions on Dredging Activities* (BUI #7)

Action	Fiscal Year (i.e. April 1 – March 31)						Lead
	19-20	20-21	21-22	22-23	23-24	24-29	
Finalize BUI re-designation report drafted in 2018.	✓						ECCC, MECP, Algoma University
Ensure the Dredging Administrative Controls document is part of the Sediment Management Strategy.	✓						Algoma University

Present draft re-designation report to BPAC to obtain feedback on moving forward with Indigenous and public engagement on BUI re-designation.	✓						Algoma University
Develop engagement plan for stakeholders and the general public.	✓						ECCC, MECP, Algoma University
Develop Indigenous engagement plan. Work with Garden River First Nation, Batchewana First Nation and the Métis Nation of Ontario to identify appropriate methods of engagement.	✓						ECCC, MECP, Algoma University
Implement public/stakeholder and Indigenous engagement plans and collect feedback.	✓						ECCC, MECP, Algoma University
Finalize draft BUI assessment and re-designation report by incorporating feedback collected from public/stakeholder and Indigenous engagement.	✓						ECCC, MECP, Algoma University
	✓						Algoma University

Present final re-designation report to BPAC to obtain feedback on submission to ECCC and MECP for re-designation.							
If support is received, send re-designation report to the Four Agencies (i.e. ECCC, MECP, USEPA, EGLE) for review.		✓					ECCC, MECP
Submit re-designation report to COA Annex co-leads and obtain official letter of re-designation.		✓					ECCC, MECP
Public announcement and make final BUI assessment and re-designation report available in digital format.		✓					Algoma University

Table 26: Work Plan for Re-designating *Loss of Fish and Wildlife Habitat* (BUI #14)

Action	Fiscal Year (i.e. April 1 – March 31)						Lead
	19-20	20-21	21-22	22-23	23-24	24-29	
Remediation of fish habitat (i.e. Whitefish Island Habitat Enhancement) – Finalize design plans for naturalizing channel bed and bank areas on Whitefish		✓					ECCC

Island and constructing islands and shoals east of Whitefish Island – Collect community input on designs – Obtain permitting requirements for construction – Confirm partnerships and leverage funds – Implement project – Develop a post construction monitoring plan – Implement the post construction monitoring plan		 ✓ ✓ ✓	 ✓	 ✓ ✓			
Prepare BUI re-designation report for evaluation against delisting criteria – If a "not impaired" status results, present draft re-designation report to BPAC to obtain feedback on moving forward with Indigenous and public engagement on BUI re-designation – If an "impaired" status results, identify next steps to re-designate					✓		ECCC, Algoma University
Develop engagement plan for stakeholders and the general public.					✓		ECCC, Algoma University
					✓		ECCC,

Develop Indigenous engagement plan. Work with Garden River First Nation, Batchewana First Nation and the Métis Nation of Ontario to identify appropriate methods of engagement.							Algoma University
Implement public/stakeholder and Indigenous engagement plans and collect feedback.					✓		ECCC, Algoma University
Finalize draft BUI assessment and re-designation report by incorporating feedback collected from public/stakeholder and Indigenous engagement.					✓		ECCC, Algoma University
Present final re-designation report to BPAC to obtain feedback on submission to ECCC and MECP for re-designation.					✓		ECCC, Algoma University
If support received, send re-designation report to the Four Agencies (i.e. ECCC, MECP, USEPA, EGLE) for review.					✓		ECCC, MECP
Submit re-designation report to COA Annex co-leads and obtain official letter of re-designation.						X	ECCC, MECP

Public announcement and make final BUI assessment and re-designation report available in digital format.						X	Algoma University

5.0 Recommendations for Future Initiatives and Actions

Although these actions are not requirements for BUI re-designation, they are recognized as important because they would benefit the health of the St. Marys River ecosystem.

- Coordinate monitoring and remediation activities with the Lake Huron LAMP.
- Monitor changes and impacts of remedial activities associated with the Contaminated Sediment Management Strategy.
- Consider the prospect of increasing flow through the Whitefish channel.
- Consult with the Sault Ste. Marie Region Conservation Authority to determine whether habitat enhancements along tributaries flowing into the AOC (i.e. Bennett, West Davignon, East Davignon, Fort Creek, etc.) are feasible.

6.0 References

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7.0 Appendix

Table 27: BUI Status and Projections by Fiscal Year for the St. Marys River AOC

Beneficial Use Impairment (BUI)	Canada	United States
Restrictions on Fish Consumption	2023	2021
Degradation of Fish and Wildlife Populations	2021	2019
Fish Tumours or Other Deformities	2024	2021
Bird and Animal Deformities or Reproductive Problems	2015	2014
Degradation of Benthos	-	-
Restrictions on Dredging Activities	2021	2018
Eutrophication or Undesirable Algae	2018	2017
Beach Closings	2018	2016
Degradation of Aesthetics	2018	2014
Loss of Fish and Wildlife Habitat	2024	2019