Ontario

Black Bay Fisheries Management Plan

Ministry of Natural Resources
Fish and Wildlife Services Branch – Upper Great Lakes Management Unit
Draft (June 2025)

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Land Acknowledgement and Aboriginal and Treaty Rights Statement

Indigenous peoples have a long history of fisheries stewardship. The fisheries of Black Bay were cared for by Indigenous peoples long before the inception of Canada, Ontario, or the Ministry of Natural Resources (MNR). We acknowledge that Black Bay is located within the traditional territory of the Anishinaabe Peoples, the Robinson Superior Treaty area, and the traditional harvesting territory of Metis peoples. The Ministry of Natural Resources recognizes the fishery in Black Bay continue to be of central importance to local First Nation and Metis communities. Indigenous communities in Ontario have constitutionally protected rights to fish. The MNR recognizes and respects these rights, whether it be for food, social, ceremonial, and purposes. These rights are fundamentally different than the privileges given to licensed fishers.

The Ministry acknowledges the perspectives of First Nation and Metis communities and their representatives in the development of this Black Bay Fisheries Management Plan. As a Ministry, we have a responsibility for the sustainable management of the fishery, and we recognize the benefit of working with Indigenous partners to achieve collective goals for generations to come.

Section 35 of the *Constitution Act* recognizes and affirms existing Aboriginal and Treaty rights of Indigenous peoples of Canada. These rights protect the activities, practices, or traditions that are integral to the distinct cultures of Indigenous communities, including subsistence fishing. The province is committed to respecting Aboriginal and Treaty rights and any addressing any existing and future legal obligations in respect of First Nation and Metis communities.

1.0 Introduction

Black Bay, its fish community, and the Black Sturgeon River have been of longstanding interest and importance to Indigenous communities, the Fisheries Management Zone (FMZ) 9 council membership, stakeholders, the Province of Ontario, local municipalities, US states and federal agencies. Since the collapse of Walleye in Black Bay in the late 1960's, the Province of Ontario has been actively involved in rehabilitation efforts within the bay, that have included closures to the commercial fishery, stringent angling regulation, stocking, and scientific studies. In 2012, the province initiated an environmental assessment (EA) of the Camp 43 dam on the Black Sturgeon River under the Ontario Parks Class EA process. The purpose of this EA was to develop long-term alternatives for the management of the Camp 43 dam. In 2016/17, as required by the EA process, a draft Environmental Study Report was prepared which recommended the partial demolition of the Camp 43 and construction of a new multi-purpose barrier further upstream at the outflow of Eskwanonwatin Lake, which was the former site of the Camp 1 dam. (Bobrowicz et. al., 2010.) Following a 2019 hydraulic and stability assessment report, it was recommended that urgent and critical repairs to the Camp 43 dam be completed as soon as possible, due to public safety concerns. As a result, the Ministry of Natural Resources (MNR) and the Ministry of Environment, Conservation and Park (MECP), who took over the authority of the Camp 43 dam through the transfer of Ontario Parks from MNR to MECP in 2018, made the decision to end the EA process and make the necessary repairs to the dam. These repairs were completed in December 2020.

Since its formation in 2009, the Fisheries Management Zone (FMZ) 9 Council membership has recommended the development of a fisheries management plan specific to Black Bay. In response, the province assured that a Plan would be developed once a decision on the Camp 43 dam was made. Following the province's decision to repair the Camp 43 dam, the Ministry, led by the Upper Great Lakes Management Unit (UGLMU) began the planning process in 2022.

The purpose of this fisheries management plan is to guide the responsible management of fisheries resources within Black Bay. The plan includes long-term goals and objectives and supporting management actions that will seek to ensure the long-term sustainability of the Black Bay fish community. As a result of the planning

process, it is anticipated that several regulatory changes may be made that will be reflected in the Ontario Fishing Regulations. In addition to outlining restoration efforts and regulatory changes, the plan will incorporate a long-term assessment and monitoring framework. Fisheries-independent survey data will be analyzed to assess progress toward meeting the plan's goals, objectives, and targets.

Physical and Biological Description of Black Bay

Black Bay is a large embayment on the north shore of Lake Superior, with a surface area of approximately 60,000 hectares. It is located roughly 38km east of the City of Thunder Bay. The bay extends 55 km north to south and 17 km east to west at its widest point (Figure 1). Nearly 80% of Black Bay is less than 15 meters in depth making it warmer and more productive than the open waters of Lake Superior. The southern end of Black Bay is characterized by cold, deep, oligotrophic conditions, contrasting with the warmer, shallower northern areas of the bay. This diversity in habitat supports a rich coolwater and coldwater fish community, including Lake Whitefish (*Coregonus clupeaformis*), Yellow Perch (*Perca flavescens*), Walleye (*Sander vitreus*), Northern Pike (*Esox lucius*), Lake Trout (*Salvelinus namaycush*), Cisco (*Coregonus artedii*) as well as introduced pacific salmonids including Rainbow Trout (*Oncorhynchus mykiss*) and Chinook Salmon (*Oncorhynchus tshawytscha).* Lake Sturgeon (*Acipenser fulvescens*), which are currently listed as threatened under Ontario's *Endangered Species Act (ESA),* also inhabit the bay.

Historical Fisheries

Indigenous / Subsistence Fisheries

For centuries, Black Bay has been an important to Indigenous communities. Based on current knowledge of the historical fish community in Black Bay, combined with period European accounts from other parts of Lake Superior (e.g., Agassiz 1850; Kohl 1860), it is likely that Indigenous harvest from this area specifically targeted Lake Whitefish but seasonal harvest of Walleye, Cisco, brook trout, and likely lake sturgeon would have also occurred.

Recreational Fisheries

There is little mention of recreational fishing in Black Bay or Lake Superior in early records, except for the world-class brook trout fishery on the nearby Nipigon River. However, following the end of World War II, recreational angling became a popular pastime, with Walleye being the principal species of interest up until the collapse of the Nipigon Bay and Black Bay populations in the 1960's (Wilson, 1991). By the late 1950's, the Black Sturgeon area was a popular fishing destination, with over 23,000 hours of angling effort being reported in a 1957 creel census, with most anglers choosing to target Walleye and Northern Pike (Rettie, 1958). Black Bay continues to be an important location for recreational fishing, supporting a popular Yellow Perch ice fishery, a spring Northern Pike fishery near Hurkett, and an open water trolling fishery in the southern portions of the bay.

Commercial Fisheries

The earliest form of organized commercial fishing on Lake Superior began in the 1830's; the Hudson's Bay Company (HBC) organized a network of fishing stations in the Canadian waters of Lake Superior, initially to supply their own needs, but by 1835 they had expanded to supply salted fish to Detroit markets (Bouge, 2000). The HBC fishing stations were managed out of major trading posts at Michipicoten, Pic, Red Rock and Kaministiquia (i.e., Fort William). The Fort William post managed seventeen fishing stations between the American Border and Sheesheeb Bay (on the east side of the Black Bay peninsula), though their records do not indicate much use in the waters of Black Bay (Goodier, 1984).

Prior to the collapse in the late 1960's, Black Bay supported the largest population of Walleye in the Ontario waters of Lake Superior. Between 1959 and 1965, commercial harvest was approximately 95,000 kg annually and peaked in 1966 at over 135,000-160,000 kg. In 1967, a sharp decline in harvest was apparent and by 1969 the population had completely collapsed, which led to the closure of the fishery. (Berglund, 2015).

Following the crash of the Walleye population, commercial fishers shifted their efforts towards Yellow Perch in the early 1970's. Catches during this time were sustained at high levels due to high market prices. However, between 1981 and 1983 there were

noticeable declines in Yellow Perch catch per unit effort (relative abundance) which led the closure of the spring fishery in 1984. Despite the closure of the spring fishery, catches continued to decline to a three-decade low in 2003, leading to a complete closure of the fishery in 2004, to allow the population to recover (Chase and Black, 2003) (Addison, 2008). It has remained closed since (Figure 2.).

Presently, commercial fishing occurs in Black Bay, with fishers targeting Lake Whitefish and Lake Trout in the southern portion of the bay. In 2023, 18,790 kg of Lake Whitefish and 2197 kg of Lake Trout were harvested respectively from Quota Management Zone S03 (Black Bay) (Table 1) (OMNR-UGMLU, 2024). However, targeted commercial fishing effort for walleye and yellow perch is not allowed.

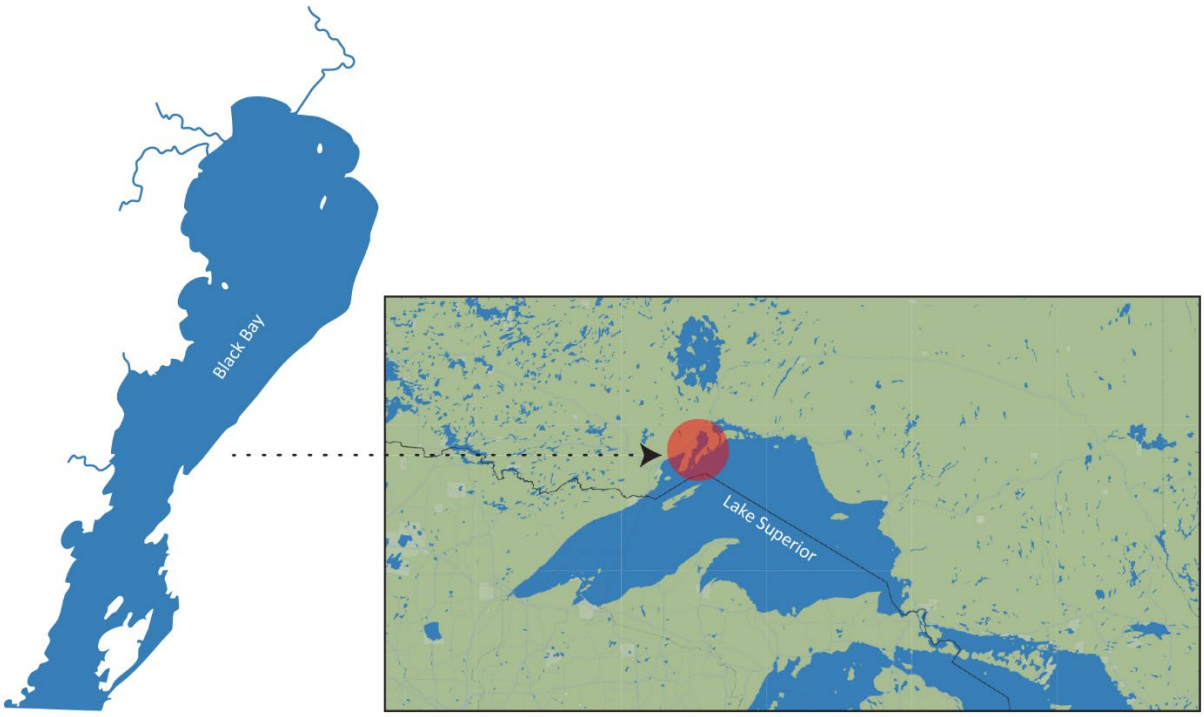

Figure 1. Map of Black Bay with a reference to its location within Lake Superior

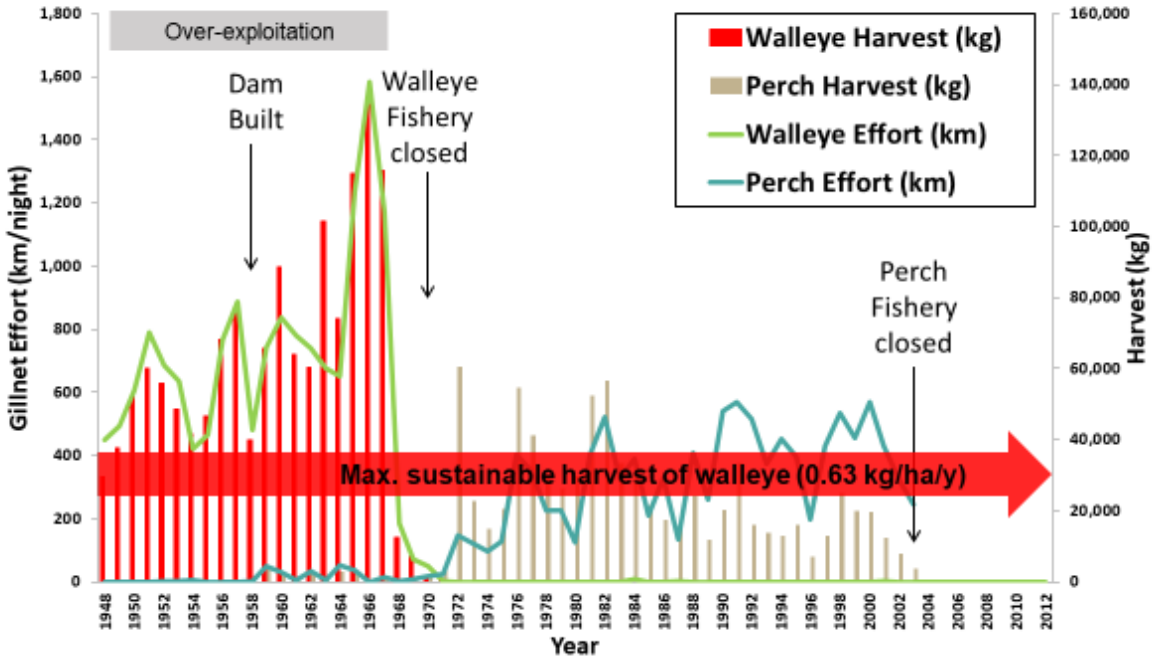

Figure 2. Annual commercial harvest and effort for Black Bay Walleye and Yellow Perch.

Table 1. Commercial catch, harvest, and quota of various commercial and non-targeted species in Black Bay (S03) between 2021 and 2023.

Year	Species	Catch (Kg)	Harvest (Kg)	Quota (Kg)
2021	Lake Trout	2845	2250	7657
	Lake Whitefish	13690	13690	31972
	Cisco	24	0	38219
	Northern Pike	35	35	3503
	Walleye	559	105	652
Totals		***17152***	***16080***	***82003***
2022	Lake Trout	1451	1406	8423
	Lake Whitefish	10875	10873	35170
	Cisco	48	0	38219
	Northern Pike	3	0	3503
	Yellow Perch	10	1	406
	Walleye	1020	119	652
Totals		***13407***	***12399***	***86373***
2023	Lake Trout	2812	2197	8423
	Lake Whitefish	18900	18790	35170
	Cisco	191	27	38219
	Northern Pike	145	4	3503
	Yellow Perch	9	1	406
	Walleye	1211	178	652
Totals		*23268*	*21196*	*86373*

2.0 Rehabilitation Efforts/Actions

Since the early 1970's, the Province of Ontario has prioritized the rehabilitation of the Black Bay Walleye and Yellow Perch populations. The following outlines the management actions taken to date to support these efforts.

2.1 Stocking

Following the Walleye population collapse in the late 1960's there have been several stocking events to rehabilitate the Black Bay Walleye population. These include:

- Transfer of 1,034 adult Walleye from the Current and Pigeon Rivers in 1972.
- Transfer of 768 adult Walleye from local inland lakes from 1998-2000.
- Stocking of 1,000,000 Walleye fry (Cloud Lake strain) in 2003.
- Stocking 260,000 summer fingerlings (St Mary's River strain) in 2004 and 2005.

These stocking events all had varying degrees of success. The 2004 and 2005 plantings from the St Mary's River were found to be successful as they grew to adulthood and comprised 71% and 45% of the 2004 and 2005-year classes respectively (Garner et al., 2013).

2.2 Harvest Control / Closures

Harvest control measures such as catch, and possession limits and quota are tools often used by fisheries managers to control or limit harvest of a desired species. As part of Walleye and Yellow Perch rehabilitation efforts, the province has implemented several of these controls in Black Bay since the early 1970's:

- Closure of the commercial Walleye fishery (1971).
- Closure of spring commercial Yellow Perch fishery (1984)
- Closure of the recreational Walleye fishery in Black Bay north of Bent Island (1999)
- Closure of the recreational Walleye fishery on the Black Sturgeon River from the mouth to the first set of rapids (1999).
- Closure of the entire commercial Yellow Perch fishery (2003).
- Reduction in the lake-wide recreational Walleye fishery catch and possession limit from 3 to 2 fish (2008).

- Closure of the recreational Walleye fishery in the Black Sturgeon River from the mouth to the Camp 43 dam in 2008 (Petzold, 2004).

2.3 Monitoring / Assessment

The MNR is responsible for assessment and management of fisheries in Lake Superior. The Ministry's assessment program is used to collect information for various fish species in Lake Superior to determine stock status as well as to monitor progress toward rehabilitation. Since the early 2000's, monitoring/assessment of Black Bay's fish community has been a priority for the province. These surveys have also allowed the province to monitor the status of various species in the fish community and to track the recovery of both Walleye and Yellow Perch within the bay. The following fisheries independent surveys have been used by the Ministry to assess the fish community and have been used to estimate relative abundance, determine the population/age structure, and to estimate levels of mortality among other metrics used in fisheries management.

- **Fall Walleye Index Netting Survey (FWIN)** – Fall Walleye Index Netting (FWIN) is a standardized gill-net assessment survey that focuses on the collection of biological information to support the management of percids in both lakes and rivers. FWIN's utilize multi-mesh (25 mm – 152 mm) gillnets set overnight in the fall in water depths between 2.5 m and 15 m (Morgan, 2002). The ministry conducted FWIN surveys in Black Bay in 2002, 2008, 2010, 2012, 2013, 2014, 2016, and 2017.
- **Broad-scale Monitoring Survey (BsM)** In 2004, the MNR released the Ecological Framework for Fisheries Management (EFFM). The focus of this framework was to move away from individual lake management to a landscape-based approach with the development of Fisheries Management Zones (FMZ's). One component of the EFFM was the development of broad-scale fish community monitoring (BsM) surveys, which are conducted between July and August. BsM surveys combine two-types of multi-mesh gillnets to assess the fish community of a given lake; large-mesh (North American 1) that targets larger fish (mesh-sizes 38 mm to 127 mm) and small-mesh gill-nets (Ontario small-mesh) that target smaller fish (mesh-sizes 13 mm to 38 mm)

(Sandstrom et. al., 2013). In 2020, the Ministry transitioned from FWIN to BsM surveys, conducting BsM surveys in Black Bay in 2020, 2023, and 2024.

- **Fish Community Index Netting Survey (FCIN)** - The FCIN is a multi-mesh gill-netting survey that was designed specific to Lake Superior, with the purpose of collecting biological information on fish species of commercial and recreational interest (UGLMU, 2024).

3.0 Binational Commitments and Existing Policies

Due to the importance and binational nature of the Lake Superior and the other Great Lakes, there are several existing pieces of legislation, regulations, policies, and plans that guide or influence the development of this Plan.

3.1 Great Lakes Fisheries Committee (GLFC) - Joint Strategic Plan for Management of Great Lakes Fisheries

The Great Lakes Fishery Commission was established by the 1954 Convention on Great Lakes Fisheries, a treaty between Canada and the United States. One of the commission's primary responsibilities is to "develop and maintain working arrangements" among the fishery jurisdictions within the basin. This responsibility is carried out through the Joint Strategic Plan for Management of Great Lakes Fisheries (JSP). The JSP establishes a formal commitment by the Province of Ontario, the Great Lake States, three American Tribal organizations, and several U.S. and Canadian federal government agencies to a set of procedures intended to ensure that the actions of one fishery-management agency do not jeopardize the interests of a sister agency (GLFC, 2007). Thus, any management outcomes derived from BBFMP planning process cannot negatively impact the management efforts our partnering agencies. The plan also includes a goal statement that provides collective direction for fishery management:

"*To secure fish communities, based on foundations of stable self-sustaining stocks, supplemented by judicious plantings of hatchery-reared fish, and provide from these communities an optimum contribution of fish, fishing opportunities and associated benefits to meet needs identified by society for; wholesome food, recreation, cultural heritage, employment and income, and a healthy aquatic ecosystem.*" (GLFC, 2007).

3.2 Fish Community Objectives (FCO's) for Lake Superior

One of the key commitments made in the JSP is the development of Fish Community Objectives (FCO's) for each lake. Lake Superior's FCO's provide a framework for management decisions and contain specific management strategies on a species-by-species basis. The document also promotes a common understanding of Lake Superior's ecosystem functions and provides direction to guide management

practices for fisheries management agencies (Horns et. al., 2003). Thus, fisheries management goals and objectives that are developed within the BBFMP process should align with the directions set out in the Lake Superior FCO's.

To view Lake Superiors FCO's in their entirety, visit:
https://www.glfc.org/pubs/SpecialPubs/Sp03_1.pdf

3.3 Great Lakes Water Quality Agreement (GLWQA)

The 2012 Great Lakes Water Quality Agreement commits the governments of the Canada and the United States of America to restore and protect the Great Lakes through a series of short and long-term actions. The agreement is made up of 10 annexes, of which, Annex 7 focuses on habitat and species health and rehabilitation of Lake Superior's native fish community. Through implementation of the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health (2021), Ontario and Canada work together to ensure Canada is meeting its commitments under the GLWQA (Governments of Canada and USA, 2012) (MECP and ECCC, 2021).

3.4 Ontario's Provincial Fish Strategy – Fish for the Future

Developed in 2015, Ontario's Provincial Fish Strategy provides a practical and strategic framework to inform fisheries related policy development, decision making and science priority setting. The goal of the strategy is to improve the conservation and management of the province's fisheries and the ecosystems that they rely upon and to promote, facilitate and encourage fishing as an activity that contributes to the nutritional needs and the social, cultural, and economic well-being of individuals and communities in Ontario (OMNR, 2015). The strategy also provides direction on key management approaches, such as application of the precautionary principle in situations of uncertainty, the use of the adaptive management approach which is the systematic approach of "learning through doing", and the use of indicators and benchmarks that can be used to assess the state of a population and that can be used to direct management decisions. Furthermore, Ontario's Provincial Fish Strategy outlines ecological principles and conduct that are expected to be considered in management planning and decisions making processes. Ecological principles such as natural capacity, natural reproducing/self-sustaining populations, and protection among others are critical in achieving long-term fisheries management objectives

(OMNR, 2015). These management approaches and principles have been used to guide the development of the BBFMP.

3.5 Walleye and Lake Sturgeon Rehabilitation Plans for Lake Superior.

The Lake Superior Technical Committee (LSTC) under the auspices of the Great Lakes Fishery Commission (GLFC) recognized Black Bay as a priority area for lake sturgeon and Walleye rehabilitation in Lake Superior. In 2003, the LSTC developed lakewide rehabilitation plans for both species with the purpose of establishing goals, objectives, and strategies to maintain, enhance or rehabilitate populations in areas where they historically lived. The plans also outlined and highlighted assessment and research needs (Hoff, 2003) (Auer, 2003).

Walleye Rehabilitation Plan for Lake Superior

The Walleye Rehabilitation Plan for Lake Superior outlines objectives specific to Walleye in Black Bay, as well as lakewide objectives that apply to Black Bay. These include:

- Increase the relative abundance of juvenile Walleye.
- Increase the abundance of spawning Walleye in Goulais Bay, Batchewana Bay, Nipigon Bay, ***Black Bay,*** and Thunder Bay in Ontario, which will be measured by the absolute abundance of spawners.
- Reduce contaminant concentrations in Walleye.

The plan also sets out a rehabilitation target for the Black Bay Walleye population to include catch of Walleye in index gillnets of 150 kg/km. In the 2001 document titled *"Black Bay Walleye Rehabilitation Options"* Colby and Foster established an objective that the population should reach a biomass that is sufficient to support a sustainable annual harvest of 47,000 kg (calculated to be historic maximum sustainable yield MSY). However, in 2004, the MNR hosted a science-based workshop in Sault Ste. Marie, Ontario with 31 fisheries professionals from across the Great Lakes. The purpose of this workshop was to review background information, case studies and impediments to develop a Black Bay Walleye Rehabilitation Plan. Participants

reviewed the objectives and suggested that 47,000 kg of harvest was too optimistic, and that 23,500 kg (i.e. half of MSY) was more realistic.

Lake Sturgeon Rehabilitation Plan for Lake Superior

The Lake Sturgeon Rehabilitation Plan for Lake Superior established a rehabilitation goal to "maintain, enhance, and rehabilitate self-sustaining populations where the species historically occurred basin-wide". The Plan defines a self-sustaining population as a population with a minimum of 1,500 mature adults that are using a common tributary for spawning, has a proportionate sex ratio and 20 or more-year classes of adult fish. Both the Wolf and Black Sturgeon Rivers of Black Bay are listed in the rehabilitation plan as priority streams where efforts should be focused (Auer, 2003).

4.0 Black Bay Fisheries Management Plan Working Group

The Province of Ontario committed to developing a fisheries management plan for Black Bay once a decision on the Camp 43 dam on the Black Sturgeon River was made. Following emergency repairs to Camp 43 dam in 2020, staff from the Ministry sought expressions of interest to join a Black Bay Fisheries Management Plan (BBFMP) Working Group from First Nation and Metis communities as well as stakeholder groups that have a vested interest and knowledge of Black Bay and its fish community. The role of working group members was to represent the views of their community or stakeholder group and to provide advice and knowledge to the MNR to use in the development of the Plan.

This process involved several key steps, including formulating an overall goal statement for the Plan, along with species specific goals and objectives; review of monitoring and reporting results; and recommendations for potential management actions to meet objectives. Following its formation, the working group met fifteen times between April 2023 and September 2024. The BBFMP Working Group is made up of the following communities and organizations:

- Red Rock Indian Band
- Fort William First Nation
- Metis Nation of Ontario
- Red Sky Independent Metis Nation
- Thunder Bay Salmon Association
- North Shore Rainbow Trout Association
- Northern Ontario Sportsmen's Alliance
- Ontario Commercial Fishing Association
- Ontario Federation of Anglers and Hunters
- Black Bay Fish & Game Club
- Nature Conservancy of Canada
- Independent/Special Interest
- Parks Canada - Lake Superior National Marine Conservation Area (NMCA)

5.0 Guiding Principles

During the planning process, the following ecological principles provided guidance in the development of management goals, objectives, and actions. These principles are derived from the Provincial Fish Strategy and align with the Black Bay Fisheries Management Plan - Terms of Reference (ToR), which were established at the start of the process.

1. **ECOLOGICAL APPROACH**: An ecological approach to fisheries management, based on the best available science, will be adopted, to ensure conservation and sustainable use of the resource.

2. **BALANCED RESOURCE MANAGEMENT**: Strategies and actions will consider the ecological (e.g., climate change, species at risk), economic, social, and cultural benefits and costs to society, both present and future.

3. **SUSTAINABLE DEVELOPMENT**: The finite capacity of the resource is recognized in planning strategies and actions within Lake Superior and Black Bay. Only natural resources over and above those essential for long-term sustainability requirements are available for use, enjoyment, and development. Planning strategies and actions may also be the result of the larger lake-wide management approach guided by *A Joint Strategic Plan for Management of Great Lakes Fisheries, Fish Community Objectives for Lake Superior, the Lake Superior Lakewide Management Plan, the Ontario Provincial Fish Strategy.* and bi-national species-specific rehabilitation plans (Walleye, lake sturgeon, Lake Trout, brook trout and Cisco (lake herring).

4. **BIODIVERSITY**: Fisheries management will ensure the conservation of biodiversity by committing to healthy ecosystems, protecting our native and naturalized species, and sustaining genetic diversity of fisheries in the FMZ. All species in the fish community of Black Bay, including non-sport fish and Species at Risk (SAR) must be considered.

5. **NATURAL REPRODUCTION:** Priority will be to rehabilitate and maintain a diverse, healthy fish community, dominated by naturally reproducing species that support sustainable fisheries.

6. **HABITAT PROTECTION:** The natural productive capacity of habitats for Canada's fisheries resources will be maintained by applying Fisheries and Oceans Canada fish habitat policy goals.

7. **VALUING THE RESOURCE**: Indigenous communities, stakeholders and other users will be invited to improve their understanding and appreciation of the value of fisheries resources and to advise on decisions made by the MNR that may directly or indirectly affect aquatic ecosystem health.

8. **RESPONSIBILITY**: Local, regional, provincial, federal, and bi-national cooperation and sharing of knowledge, costs and benefits will be sought to manage fisheries in Black Bay.

9. **INDIGENOUS INTERESTS**: Ontario is committed to building better relationships with Indigenous peoples and in involving them in decisions that affect them and their interests.

10. **DIRECT ACTION**: All feasible options must be considered and evolve to implementation actions.

11. **KNOWLEDGE**: The best available information will be used for Black Bay fisheries objectives setting and strategy development and implementation. Information from the bi-national lake-wide fisheries monitoring and reporting program will be of use in this regard.

12. **ADAPTIVE MANAGEMENT**: Black Bay will be managed using an adaptive management approach. Objectives will be set, monitoring will occur, results will be compared against objectives and management regimes adjusted as necessary and where possible to ensure attainment of objectives.

13. **PRECAUTIONARY PRINCIPLE:** When an activity raises concern of threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically. It is recognized that there may be issues which inherently conflict with one another and to which choices will inevitably need to be made.

6.0 Scoping

During the initial BBFMP meetings, the working group conducted a scoping exercise to determine the geography which would be covered by the Plan as well as the fish species that would be included. At the same time MNR staff notified the group of items/subjects that would be out of scope throughout the planning process to ensure discussions remained on track:

6.1 In Scope

Species in Scope:

- Walleye
- Lake Trout
- Chinook Salmon
- Yellow Perch
- Lake Whitefish
- Cisco
- Northern Pike
- Smallmouth Bass
- Brook Trout
- Rainbow Trout
- Invasive Species
- Lake Sturgeon
- Prey Fis

Geographic Coverage of the Plan

The working group discussed three potential options for what area the Plan would cover:

A) Same boundaries of Quota Management Zone 3 (Commercial Fishing Boundaries) plus tributaries up to the first barrier.
B) All Black Bay to the Southern tip of Edward Island, including tributaries up to the first barrier.
C) All Black Bay to the Southern tip of Porphry Island, including tributaries.

Ultimately the group recommended that Option C be used to describe the geographic range of the plan as it did the best job of encompassing what is believed to be the entire extent of Black Bay (Figure 3).

Figure 3. Options for geographic scope discussed by the BBFMP Working Group (Zoomed in on Southern portion of Black Bay). Option C was the option chosen by the working group.

6.2 Out of Scope

- **The Camp 43 Dam** – In 2020, the province made the decision to repair the dam due to safety concerns. Currently, no further actions are being considered, as a result the Camp 43 dam was out of scope for the Black Bay FMP planning process.

- Any animals other than the fish species that are scoped into the Plan. (i.e., invertebrates etc.).

7.0 Black Bay Fisheries Management Plan Goals

Early in the planning process the working group was asked to develop an overall goal for the Plan which would be used to guide discussions and planning throughout the process. Two separate goals were developed to address Indigenous, recreational, and commercial interests in the bay:

7.1 Goal Statement One.

To manage and conserve the fish community of Black Bay in a way that focuses on the sustainability and rehabilitation of native fish species and their ecosystems, while also managing for self-sustaining populations of naturalized species, in a manner that is compatible with the management and rehabilitation goals for native species; while also contributing to social, cultural, and economic benefits for all.

7.2 Goal Statement Two.

Maintain the Province's support of a sustainable commercial fishery by providing appropriate quantities of non-targeted species by-catch quota at levels that are not detrimental to the fish community.

8.0 Species by Species Planning Process

After the goals were developed the Working Group began discussing each fish species scoped into the Plan. For each species, a step-by step process was taken. MNR staff first presented all available data and information to the working group to help determine the stock status of each species. After reviewing this background information, the group was then asked to identify issues or concerns they had for each species. Following this issues identification process species specific goals and objectives were developed along with appropriate actions and management strategies.

8.1 Rainbow Trout

Rainbow Trout Background Information

Rainbow Trout (Rainbow Trout) were first introduced into Lake Superior in the late 1800's and were stocked extensively throughout the 1900's by both Canadian and US fisheries management agencies (Bobrowicz, 2009). Rainbow Trout are now naturalized and are sustained by natural reproduction. Rainbow Trout are an important sportfish species that provide anglers with nearshore and seasonal tributary angling opportunities. On Black Bay, tributaries such as the Wolf River, Black Sturgeon River and Coldwater Creek are popular fishing destinations for Rainbow Trout.

During the mid 1980's anglers across Lake Superior began to report fewer and smaller fish, which was attributed to over-exploitation. This led to the formation of a partnership between the North Shore Steelhead Association (NSSA) and the Ministry of Natural Resources that developed two key assessment programs; the Portage Creek Mark-Recapture Study (Portage Creek/Black Bay only) and the Co-operative Rainbow Trout Angler Program (lake-wide). Currently, these programs are the primary source of data for Rainbow Trout on Black Bay and the Ontario waters of Lake Superior.

Portage Creek Mark-Recapture Population Estimate

Portage Creek is a small spring fed tributary located approximately 50 km East of Thunder Bay on the Sibley Peninsula that empties into Black Bay. In 1991, the MNR and the NSSA initiated a three-year co-operative angler study on various Lake Superior tributaries,

including Portage Creek. The purpose of this study was to assess the status of Rainbow Trout stocks in Ontario tributaries of Lake Superior. The study found that the Portage Creek population exhibited signs of high exploitation with the percentage of repeat female spawners being less than 50% (LSMU, 1994). In 1994 a transfer of ownership in the land surrounding the lower end of Portage Creek restricted public access and effectively closed the recreational fishery. This allowed for a unique opportunity to study the effects of reduced angling pressure and harvest on a stressed population in a controlled environment (Bobrowicz, 2009).

In 1995, the partnership developed a mark-recapture study (population estimate) that would allow the MNR to better monitor and quantify fluctuations of adult Rainbow Trout in Portage Creek and use this information as a bellwether for other Rainbow Trout populations in Black Bay (i.e., the Wolf and Black Sturgeon Rivers).

Between 1991 and 1993 (prior to the transfer of land) the population was estimated to be between 485 and 924 fish. It should be noted that these estimates are based on annual mortality rates and not a formal Peterson population estimate. Once fishing mortality was removed with the transfer of land in 1994, the population gradually increased until it peaked in 2004 when the population was estimated to be over 2000 fish. Between 2007 and 2014 the population declined precipitously to which presently (2023) the population is estimated to be less than 50 fish (Figure 4). Despite Portage Creek being only a single small tributary of Black Bay, anecdotal information from the angling public suggests the same declines have occurred in other Black Bay tributary populations. There has also been a decrease in the number of year classes present in the population since its peak (Figure 5.). These declines and low numbers of adult Rainbow Trout are attributed to changes in the composition of the Black Bay fish community (Stratton et. al., 2025).

Rainbow Trout Background Information Summary

- Population does not appear to be healthy.
- Adult Rainbow Trout population estimate in Portage Creek which is used as an index population for Black Bay tributary populations, has declined approximately 90% over the last 15 years.
- Fewer age classes present in the Portage Creek adult Rainbow Trout population relative to the period of high adult Rainbow Trout abundance in the early 2000's.

- Lack of information from other Black Bay streams and Black Bay proper.

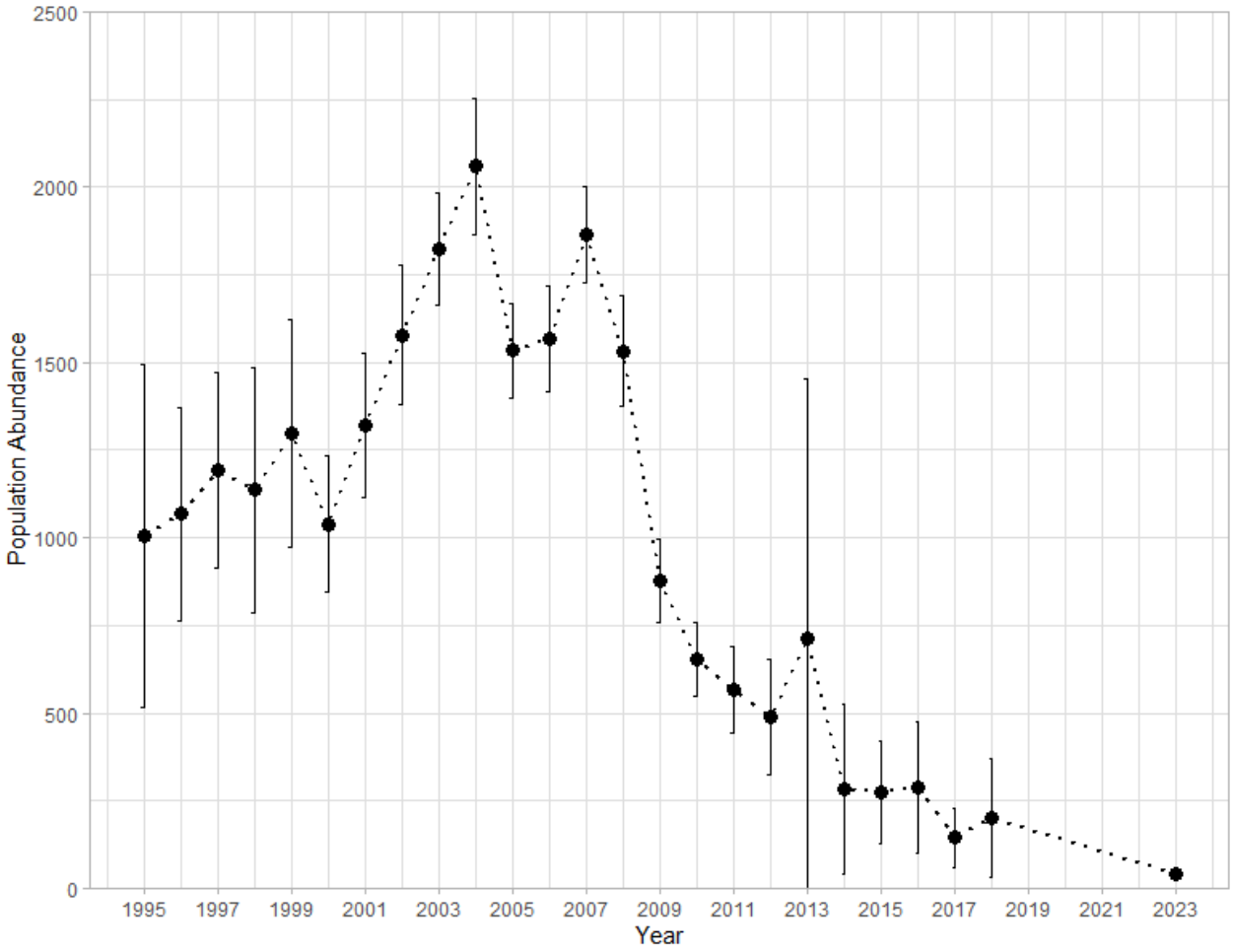

Figure 4. Rainbow Trout (Steelhead) population estimates from Portage Creek (1995-2023).

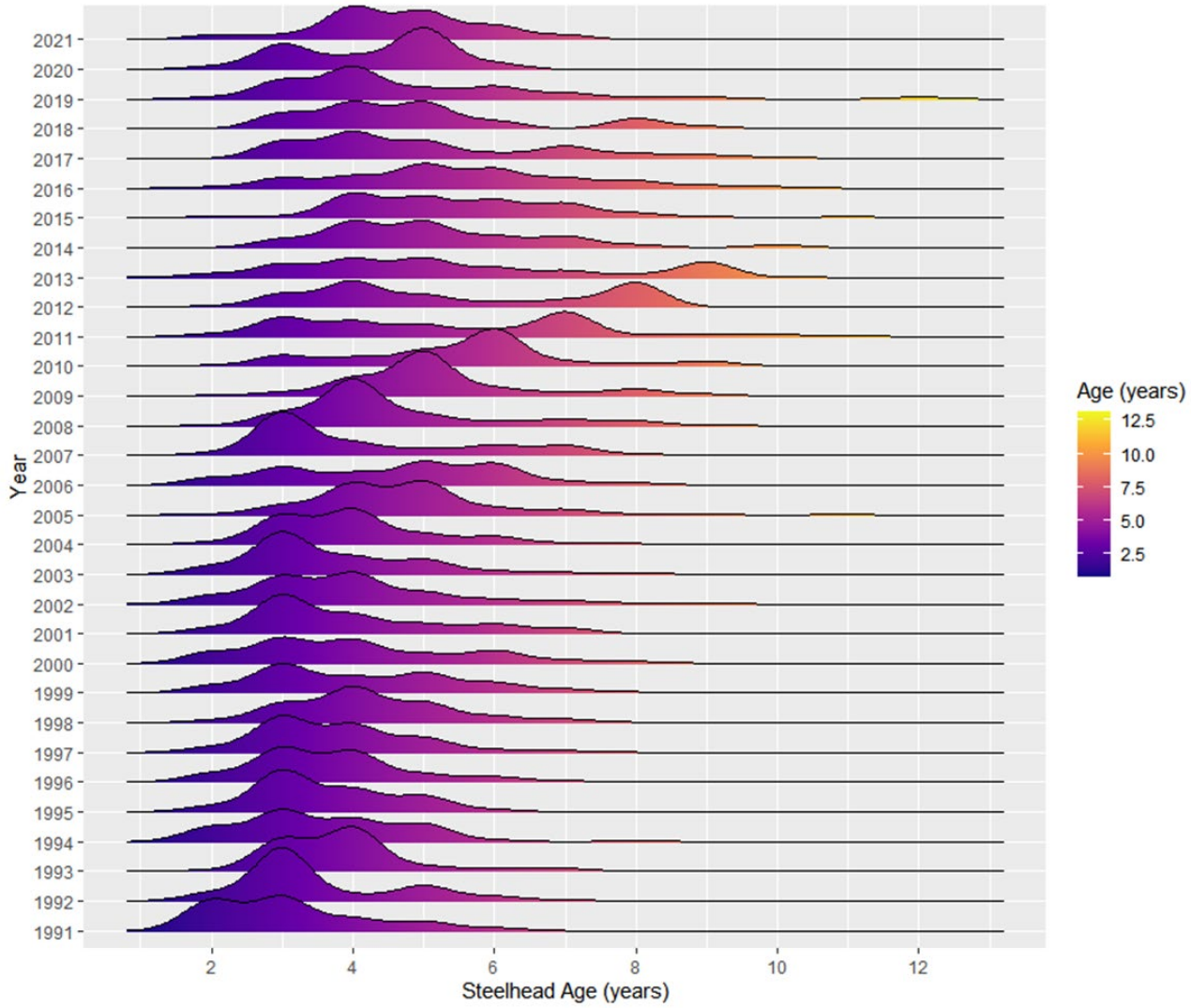

Figure 5. Portage Creek Rainbow Trout (Steelhead) age distribution (1991-2021).

Rainbow Trout Issues Identification

The BBFMP Working Group identified the following issues with Black Bay's Rainbow Trout populations:

1. Very low abundance after a steep decline from peak levels in the early 2000's.
2. Changes to the fish community likely impacting Rainbow Trout populations.
3. Lack of information / data from other Black Bay tributaries and Black Bay proper.

Rainbow Trout Ecological Objective

1. Manage and maintain Rainbow Trout populations in Black Bay in a manner that avoids any further decreases in abundance and if possible, increase abundance in a way that is compatible with the management and rehabilitation goals for native species in Black Bay.

Rainbow Trout Ecological Targets

1. Increase the adult population of Rainbow Trout in Portage Creek to 150 fish (2020 population estimate).
2. At a minimum, maintain the adult population of Rainbow Trout in Portage Creek at 39 fish (2023 population estimate).

Rainbow Trout Socioeconomic Objective

1. Make Black Bay tributaries (Coldwater, Wolf, Black Sturgeon Rivers etc.) a desirable destination for spring tributary anglers targeting Rainbow Trout.
2. Increase the amount of data collected on Black Bay Rainbow Trout populations in the cooperative angler program.

Rainbow Trout Socioeconomic Target

1. Collect 30 biological samples submitted by volunteer anglers from the Co-operative Angler Program from Black Bay tributaries annually (tributaries other than Portage Creek).

Rainbow Trout Actions and Strategies

1. Produce a reliable population estimate on Portage Creek by 2025 to evaluate the effects of 2 generations of changes to life history traits (shift from predominantly 1 year old smolts to predominantly 2-year-old smolts that is currently occurring)
2. Status Quo for harvest of Rainbow Trout in Black Bay tributaries
3. The Ministry to focus on marking and sampling Portage Creek Rainbow Trout in 2024 and 2025.
4. Provide incentives to anglers to collect more samples from Black Bay tributaries through the cooperative angler program.

8.2 Yellow Perch

Yellow Perch Background Information Summary

Yellow Perch are a common temperate fish that are found in both warm and coolwater lakes. Like Walleye, Black Bay once supported the largest commercial Yellow Perch fishery in Lake Superior. Commercial catches of Yellow Perch can be defined by three eras (Figure 6):

1) ***pre-1972*** when catches were relatively minor where most harvest was taken as by-catch in the commercial fishery at the time (between 2960 kg and 12,100 kg)

2) ***1972-1983*** when catches were sustained at a high level due to higher market prices. A quota management system was implemented in 1981 which allowed for 72,640 kg of annual harvest. The fishery primarily targeted spawning populations shortly after ice-out. CPUE dropped significantly between 1981 and 1983 which raised concerns from fishers.

3) ***1984 to 2003*** when catches declined precipitously to a three-decade low in 2003. A closure of the spring fishery was implemented in 1985 and a review of the status of stock was conducted between 1985 and 1988 to determine the efficacy of the spring closure. Analysis concluded that the population did not benefit from the closure and that CPUE's did not increase. Further monitoring was conducted between 1989 and 2003 which found that Yellow Perch abundance had declined further. A complete closure of the fishery was implemented in 2004 to protect the remaining stocks and to allow for the population to recover (Chase and Black, 2003; Addison, 2007). The commercial fishery has remained closed since, but a popular winter recreational fishery emerged around 2010.

The Ministry has continued to monitor Yellow Perch populations in Black Bay through various nearshore assessment surveys (FWIN and BsM surveys) and targeted angler creel surveys.

Fall Walleye Index Netting (FWIN) and Broad-scale Monitoring (BsM)

Since the Ministry began conducting FWIN and BsM surveys on Black Bay in 2002, Yellow Perch have consistently made up the largest proportion of the catches. In 2023, Yellow Perch made up nearly 50% of all catches in the Black Bay BsM survey (Figure 7). Yellow

Perch abundance / biomass, as indicated by CPUE, increased significantly between 2002 and 2008 from 4.15 kg/km of gillnet in 2002 to 55.24 kg/km in 2008. Between 2008 and 2017, biomass appeared to decline but has been increasing since the 2020 survey. Yellow Perch CPUE in the 2024 BsM survey was estimated to be 39.36 kg/km. (Figure 8.).

Yellow Perch sampled between 2002 and 2020 have ranged in age from 0 to 15 years (Figure 9). Since 2002, there has been an increase in the number of year classes, from 9 (age-0 to age-8) in 2002 (n= 239) to 13 (age-1 to age-13) in 2020 (n= 742), resulting in an increase in mean age from 1.4 years in 2002 to 6.3 years in 2020.

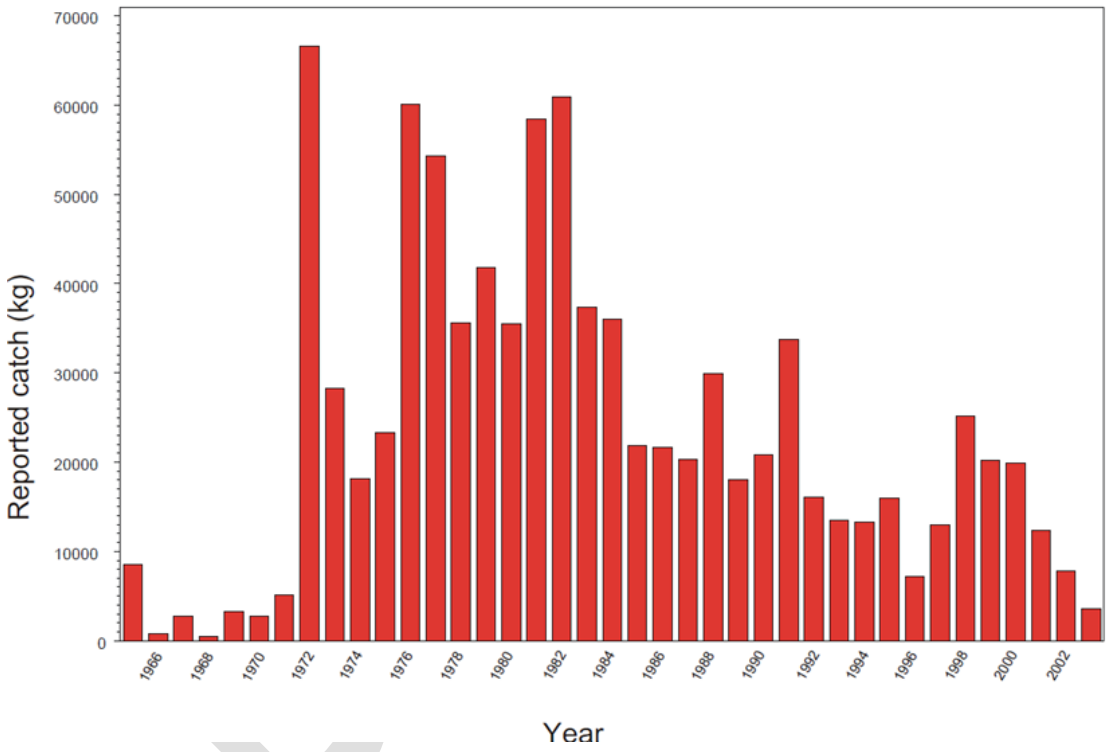

Figure 6. Reported annual commercial catch of Yellow Perch from Black Bay (spring fishery closed in 1985).

The mean total length of Yellow Perch captured in FWIN and BsM surveys on Black Bay, has increased since 2002 (mean length of 155 mm), but has declined slightly since 2017 (Figure 10). The slight decrease is likely due to what appears to be strong year-class of younger/smaller fish.

Total annual mortality of Yellow Perch in Black Bay has steeply declined since 2002, from 44.7% to 18% in 2020 (Figure 11). This decline can likely be attributed to the closure of the commercial fishery in 2004.

To summarize, information collected from FWIN and BsM surveys suggest that the Yellow Perch population is healthy with; significant increases in abundance since the early 2000's large numbers of age classes present, an increase in the average age and size, and low total annual mortality.

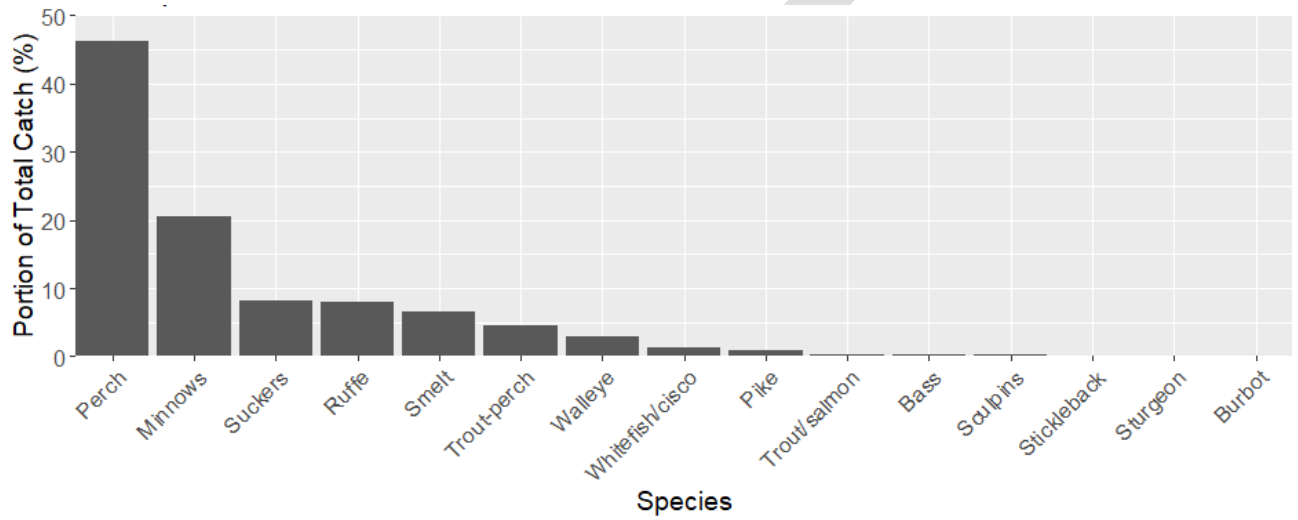

Figure 7. Proportion of total catch by species from the 2023 Black Bay BsM survey.

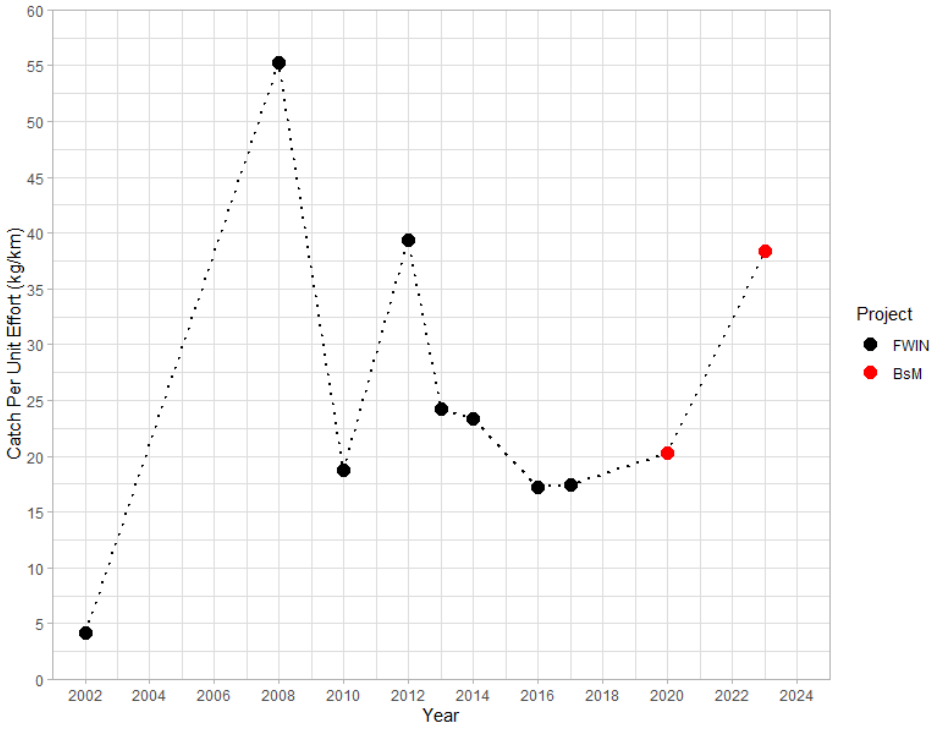

Figure 8. Catch per unit effort of Yellow Perch caught in FWIN surveys (2002-2017) and BsM surveys (2020-2023).

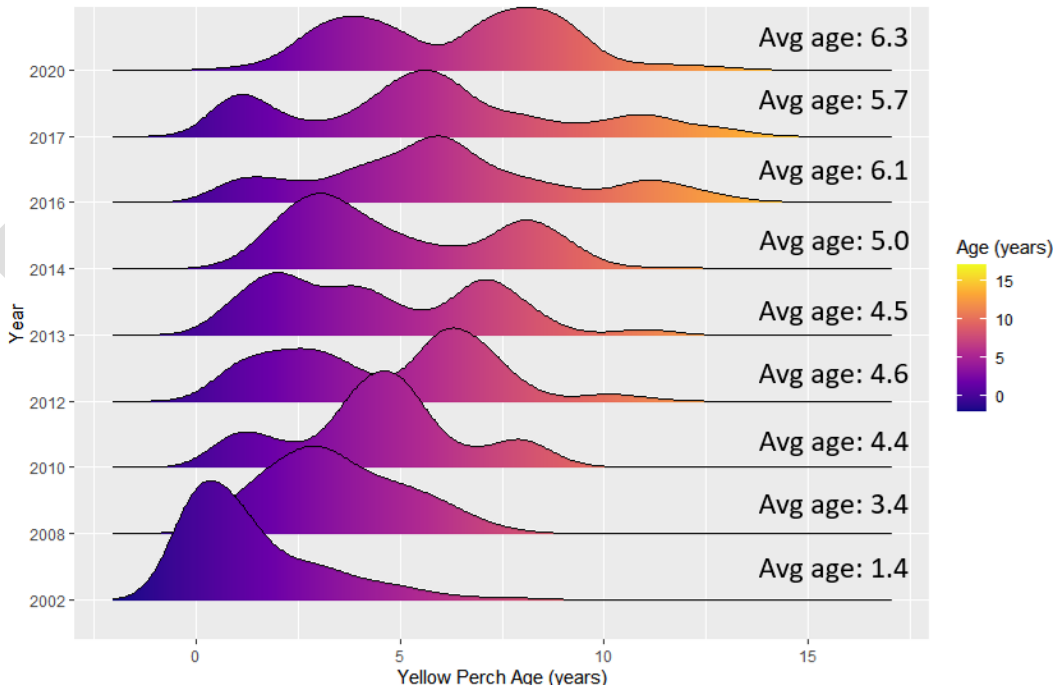

Figure 9. Yellow Perch age distributions from FWIN (2002 – 2017) and BsM surveys (2020).

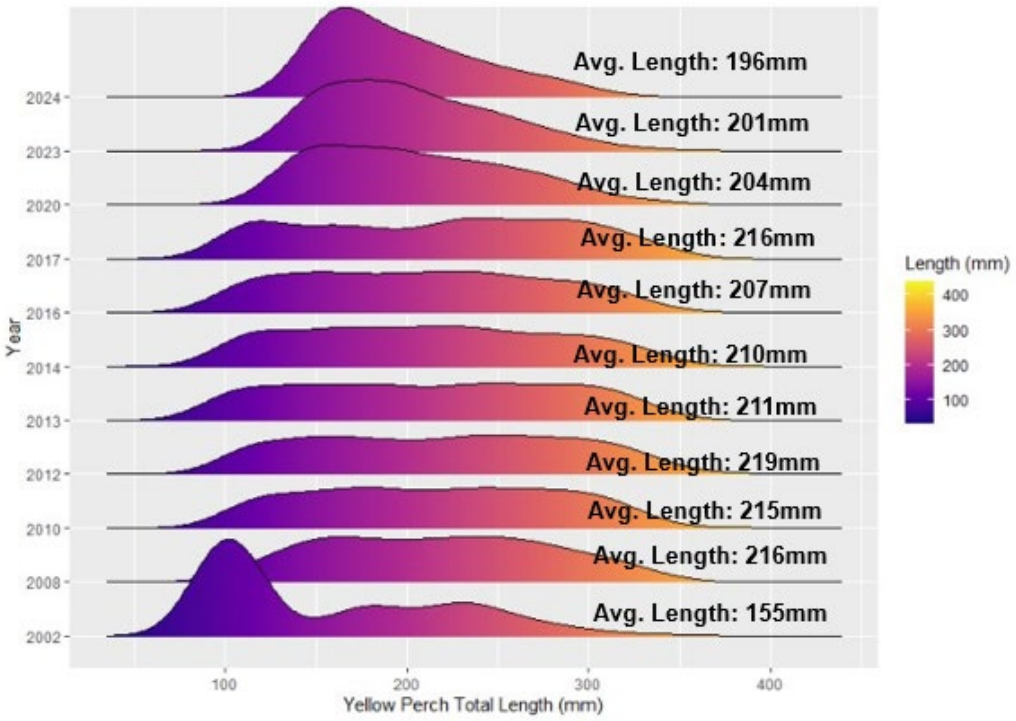

Figure 10. Yellow Perch total length distribution from FWIN (2002-2017) and BsM surveys (2020 – 2024).

Black Bay Winter Creel Surveys

The Ministry conducted winter creel surveys on Black Bay in the winter of 2014 (January 10th to March 31st) and the winter of 2022 (February 17th to March 13th). The purpose of these surveys was to collect information on angler effort and harvest during the winter fishery that typically targeted Yellow Perch. It should be noted that the winter of 2022 was extreme in nature with cold temperatures that likely impacted sampling and effort. Furthermore, the Covid-19 pandemic delayed the start of the survey and thus the results from 2022 creel may not be a true reflection of the fishery. As expected, effort (40,776 rod hours), estimated catch (46174 individuals) and harvest (24918 individuals) was significantly higher in the 2014 creel relative to the 2022 creel survey due in part to the length of the survey (3 months vs. 1 month) and more conducive environmental conditions recreational fishing (2022 was a comparatively much harsher winter than 2014). Estimated CPUE (#fish/line/hr) in 2014 (1.132) was nearly twice the estimated 2022 CPUE of 0.603. This may be indicative of a decline in Yellow Perch abundance but may also be attributed to natural fluctuations within the populations or environmental conditions such as density dependence. Despite this decline in CPUE, the Yellow Perch population in Black Bay still appears to be healthy.

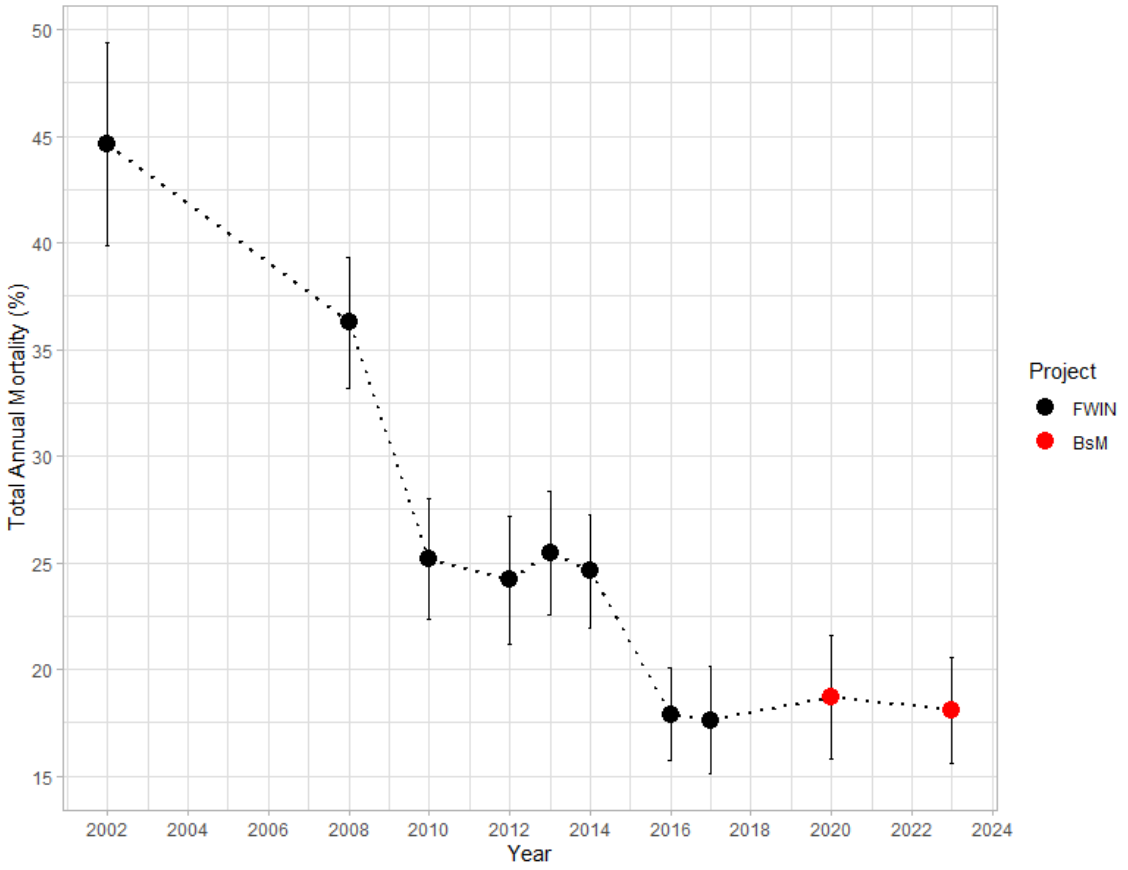

Figure 11. Yellow Perch total annual mortality estimates from FWIN surveys (2002-2017) and BsM surveys (2020-2023).

Table 2. Results from the 2014 and 2022 Black Bay winter creel surveys.

	Yellow Perch 2014	Yellow Perch 2022
Estimated Effort (Rod Hours)	40776	4974
Estimated Harvest	24918	2138
Observed Catch	6844	1752
Estimated Catch	46174	3003
% Kept	54	71
Observed CPUE (Targeted)	1.164	0.535
Estimated CPUE (Targeted)	1.132	0.603

Yellow Perch Background Information Summary

- Population appears healthy.

- Multiple age classes present in the population.
- Increased mean age since 2002.
- Increased mean total size since 2002.
- Low total annual mortality.
- Increasing abundance since 2020.

Yellow Perch Issues Identification

1. Decline in angler satisfaction due to decrease in abundance and number of "jumbo" Yellow Perch being caught in the winter fishery.
2. Outfitters at risk of loss of revenue due to decline in angler satisfaction.

Yellow Perch Ecological Objective

1. Maintain the current stock status of the Yellow Perch population in Black Bay based on information collected from Broad-Scale Monitoring.

Yellow Perch Ecological Targets

1. Maintain CPUE from BsM surveys greater than 25 kg/km.
2. Maintain an average age equal to or greater than 5 years of age for fish caught in BsM surveys.
3. Maintain total annual mortality less than y 30% based on data collected from BsM surveys.

Yellow Perch Socioeconomic Objective

1. Maintain or increase angler satisfaction in the winter ice fishery.

Yellow Perch Socioeconomic Targets

1. Maintain a CPUE of greater than 0.6 fish/angling hour in the winter recreational fishery; based on winter creel surveys.
2. Average total length of Yellow Perch greater than 200mm from BsM surveys.

Yellow Perch Actions and Strategies

1. Continue to conduct assessment surveys on Black Bay to ensure the above objectives are being met.

8.3 Northern Pike

Northern Pike Background Information

Fall Walleye Index Netting (2002-2017) and Broad-scale Monitoring Surveys (2020-2024).

Northern Pike are a common sportfish species throughout the inland waters of northwestern Ontario. The north end of Black Bay, especially Hurkett Cove and Cranberry Bay are popular destinations for anglers targeting Northern Pike. FWIN and BsM surveys indicate that Northern Pike abundance has increased significantly in Black Bay from 0.55 fish captured per kilometer in 2002 to 17.36 fish captured per km in 2023 (Figure 12). Although Northern Pike have not been aged in every FWIN and BsM survey, average age has increased from 3.1 years in 2012 to 5.4 years in 2023 (Figure 13). The number of year classes present also increased from 7 in 2012 to 9 in 2016 and 2023. Although both FWIN and BsM surveys don't effectively catch larger individuals in the population, the average total length of fish captured in these surveys has remained constant since 2008 (Figure 14).

Hurkett Cove Spring Access Creel

In the spring of 2024, the Ministry initiated a spring access creel at Hurkett Cove in the northwest end of Black Bay for the purpose of better understanding recreational fishing effort, catches and harvest of Northern Pike as well other species. Of the total estimated 1117 rod hours of effort 881 of those were from anglers targeting Northern Pike. An estimated 621 Northern Pike being caught with a CPUE of 0.705 fish/hour. Of the 621 fish caught it is believed that approximately 88 were harvested.

Northern Pike Background Information Summary

- Population appears healthy.
- Northern Pike abundance has increased significantly since 2002.
- Average age has remained stable over time since 2002.
- Average length has remained stable since 2002.

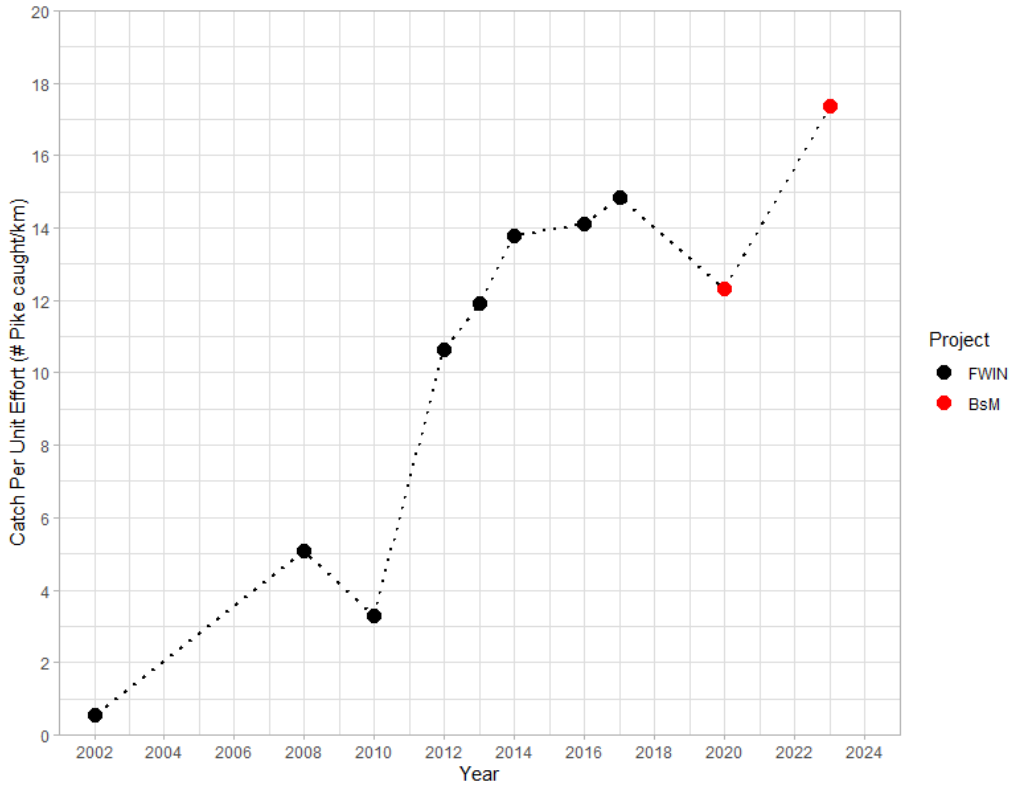

Figure 12. Northern Pike CPUE from FWIN (2002-2017) and BsM (2020-2023) surveys.

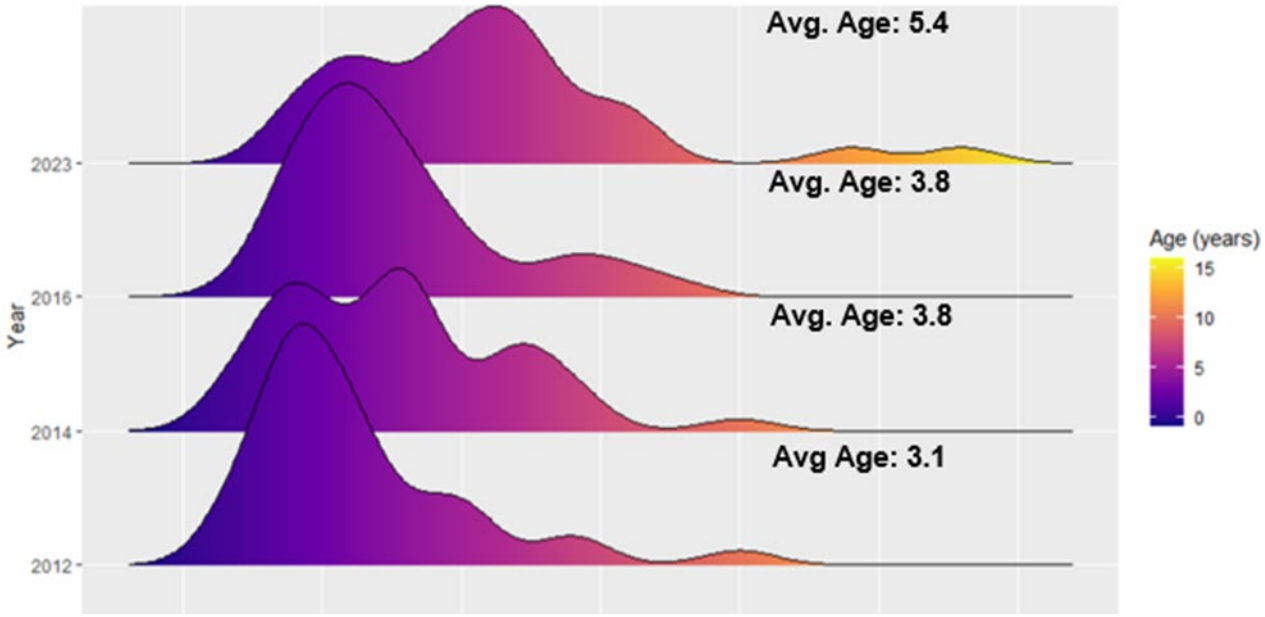

Figure 13. Northern Pike age distributions from FWIN (2002-2017) and BsM surveys (2020-2023).

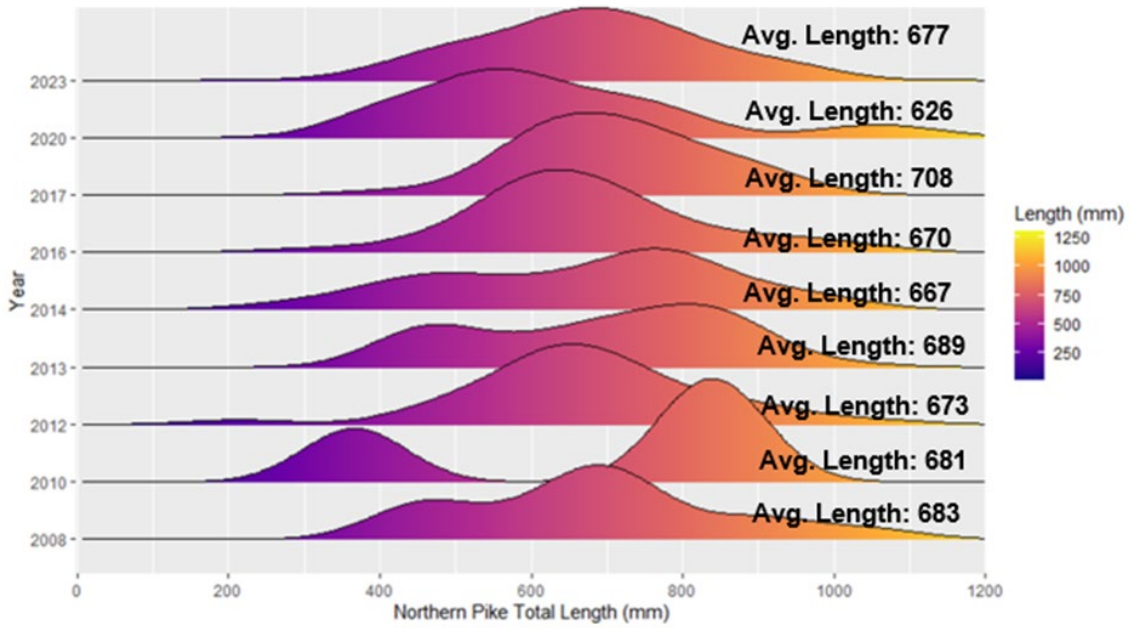

Figure 14. Northern Pike total length distributions from FWIN (2008-2017) and BsM surveys (2020-2023).

Northern Pike Issues Identification

1. Angler dissatisfaction with not being able to keep a desirable sized fish with the current protected slot of 70-90 cm.
2. Concerns for other species, specifically Yellow Perch and Walleye if the northern pike population keeps getting larger.

Northern Pike Ecological Objective

1. Maintain/protect the status of the current Northern Pike fishery in Black Bay.

Northern Pike Ecological Target

1. Maintain Northern Pike abundance (CPUE) above of 10 fish/km as seen in BsM surveys.
2. Maintain the mean age of Northern Pike caught in fisheries independent assessment surveys greater than 4.5 years (mean age of fish caught in the 2014, 2016 and 2023 BsM survey respectively) which ensures the presence of large fish in the population.

Northern Pike Socioeconomic Objective

1. Manage the recreational fishery in a manner that allows anglers to harvest a desired sized fish but also allows the opportunity to catch a trophy sized Northern Pike (i.e. greater than (101.6cm or 40").
2. Increase in angler satisfaction.

Northern Pike Socioeconomic Target

1. Maintain angler perception/ satisfaction of a "trophy" Northern Pike fishery.

Northern Pike Actions and Strategies

1. Reduce the daily allowable harvest from S4 to S2 and C2 to C1.
2. Remove the protected slot (70-90 cm) and implement a sport limit of two (2) fish, not more than one (1) greater than 70 cm, none greater than 90 cm and conservation limit of one (1), none greater than 90 cm.
3. Protect larger fish in the population.
4. Continue to conduct fisheries independent assessment surveys to monitor the population.

8.4 Lake Whitefish

Lake Whitefish Background Information

Lake Whitefish are common across Lake Superior and are species of cultural and socioeconomic importance. Black Bay has an active commercial fishery south of Bent Island that targets Lake Whitefish with an annual quota of 35,170 kg. The Ministry monitors the fishery through commercial harvest reporting and commercial catch sampling. Commercial harvest of Lake Whitefish in Black Bay has remained consistent over the past 10 years with fishers harvesting between 29% - 53.4% of the annual quota. (Figure 15). Commercial effort has declined since 2005 but CPUE has increased since 2016 and is consistently greater than 100 kg/km. This implies fishers are catching the same amount or more fish with less effort, which is in an indication that the population is healthy and abundant (MNR – UGLMU, 2024).

Lake Whitefish Background Information Summary

- Population appears healthy.

- Commercial harvest has remained stable for the past 10+ years but has not been close to quota.
- Sharp decrease in effort since 2010.
- Sharp increase in relative abundance (CPUE) since 2010.

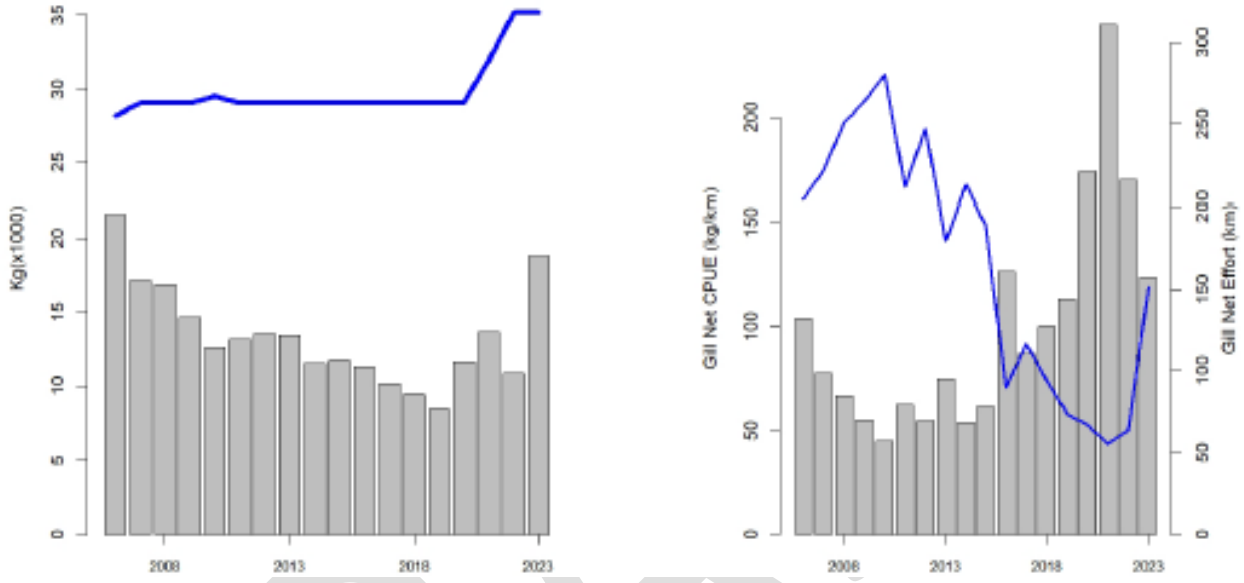

Figure 15. (Left) Lake Whitefish commercial harvest in grey bars with quota represented by the blue line. (Right) Lake Whitefish CPUE in grey bars with effort being represented by the blue line.

Lake Whitefish Issues Identification

1. Data Gaps: Lack of fisheries independent data (i.e., FCIN).

Lake Whitefish Ecological Objective

1. Maintain the current stock status of the Lake Whitefish in Black Bay.

Lake Whitefish Ecological Target

1. CPUE from the commercial fishery is greater than 95 kg/km.

Lake Whitefish Socioeconomic Objective

1. Manage commercial quotas of Lake Whitefish in a manner that ensures the long-term sustainability of the species while also managing by-catch of other species such as walleye which do not impact the sustainability of other species in Black Bay.

Lake Whitefish Socioeconomic Target

1. Optimize commercial harvest that is within the parameters of sustainability.

Lake Whitefish Actions and Strategies

1. Increase the frequency of fisheries independent assessment surveys in Black Bay, that includes Lake Whitefish.
2. Establish a CPUE benchmark/target with data collected from fisheries independent assessment surveys.
3. Collect information on year class structure from fisheries independent assessment surveys.
4. Determine total annual mortality based on information collected from independent fisheries assessment surveys.
5. Adjust quotas in accordance with the Province's Strategic Policy for Ontario's Commercial Fisheries (2011).

8.5 Lake Trout

Lake Trout Background Information

Lake Trout are a top predator that thrive in the cold unproductive waters of Lake Superior and are a species of interest both commercially and recreationally. In Black Bay, they are common in the deepwater habitats that are prevalent in the south end of the bay. As is the case for Lake Whitefish, the commercial fishery in Black Bay south of Bent Island harvests Lake Trout with an annual quota of 8,423 kg. Harvest of Lake Trout in the commercial fishery has declined since 2008 with only 20% to 30% of the quota being harvested annually over the past 5 years (Figure 16-Left). Gillnet effort has also declined since 2010 but CPUE has increased and has varied between 20.5 kg/km to 51.4 kg/km over the past 5 years,

indicating that Lake Trout abundance has increased, and that the population is healthy (Figure 16-Right) (MNR – UGLMU, 2024).

Lake Trout Background Information Summary

- Population appears to be healthy.
- Annual commercial harvest has declined since 2007.
- Decrease in effort since 2010.
- Increase in relative abundance (CPUE) since 2018.

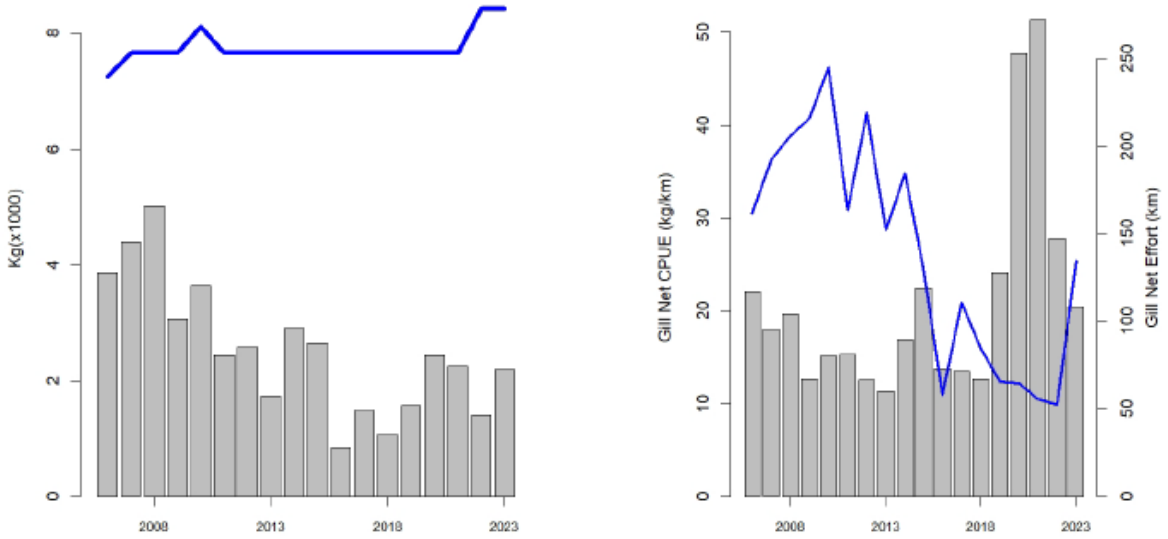

Figure 16. (Left) Commercial Lake Trout harvest on grey bars with quota represented by the blue line. (Right) Lake Trout CPUE in grey bars with effort represented by the blue line.

Lake Trout Issues Identification

1. Data Gaps: Lack of fisheries independent data.

Lake Trout Ecological Objective

1. Maintain the current status of Lake Trout in Black Bay

Lake Trout Ecological Targets

1. CPUE from the commercial fishery is greater than 20 kg/km.

Lake Trout Socioeconomic Objective

1. Manage commercial quotas of Lake Trout in a manner that ensures the long-term sustainability of the species.

Lake Trout Socioeconomic Targets

Optimize commercial harvest that is within the parameters of sustainability.

Lake Trout Actions and Strategies

1. Increase the frequency of fisheries independent assessment surveys in Black Bay, that includes Lake Trout.
2. Establish a CPUE benchmark/target with data collected from fisheries independent surveys.
3. Collect information on Lake Trout year class structure from fisheries independent surveys.
4. Determine total annual mortality based on fisheries independent assessment surveys.
5. Adjust quotas in accordance with the Province's Strategic Policy for Ontario's Commercial Fisheries (2011).

8.6 Cisco

Cisco Background Information

Cisco, formerly known as lake herring, are an important prey fish that supports many of Lake Superior's top predators. They are also a species of commercial importance with the province currently allocating 358,060 kg of Cisco quota across Ontario waters of Lake Superior. Presently most of the harvest takes place in the fall using suspended nets that target pre-spawn Cisco for the roe market. Despite 38,219 kg of Cisco quota allocated to the waters of Black Bay, there has been no commercial effort or harvest since 2020 (Figure 17). This does not imply that the status of the Cisco population in Black Bay is impaired but rather that fishers are choosing to fish elsewhere (MNR – UGLMU, 2024).

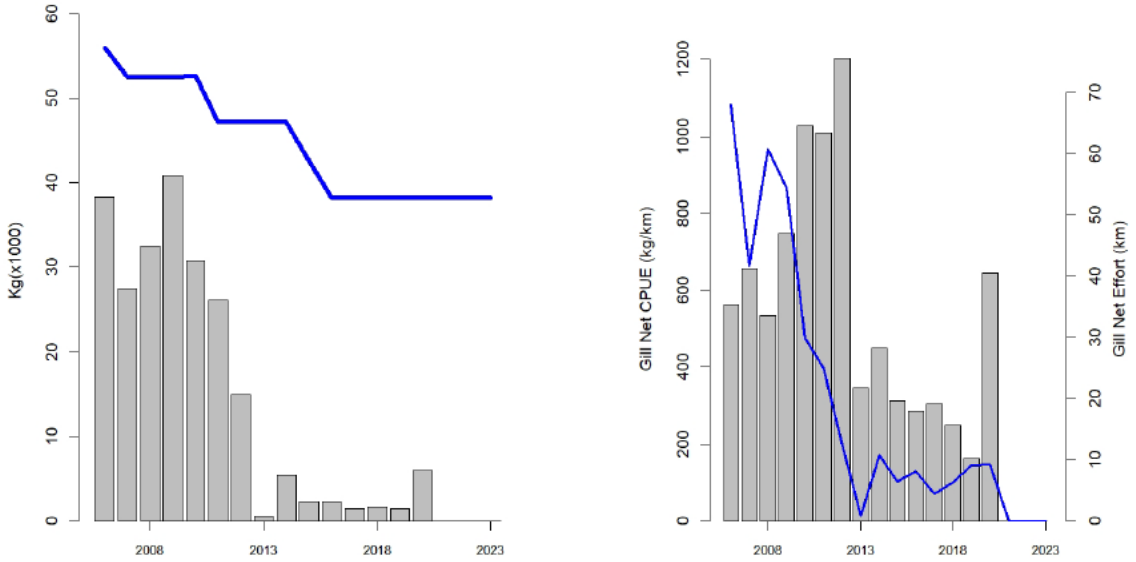

Figure 17. (Left) Commercial Cisco harvest in grey bars with quota represented by the blue line. (Right) Cisco CPUE in grey bars with effort represented by the blue line.

Unites States Geological Survey (USGS) Surface/Bottom Trawl Survey

Cisco recruitment events are naturally sporadic and are often time cyclical across Lake Superior. To monitor and predict Cisco year class strength, the United States Geological Survey (USGS) has been conducting a daytime bottom and surface trawl survey since 1978. Results from the 2022 survey indicated that the 2022-year class (age-0) of Cisco was the highest on record with an estimated 2 billon fish lake-wide. This is nearly twice as large as the 1984-year class which was the strongest seen since the onset of the survey (Figure 18) (Vinson et. al., 2023). It is believed the 2022-year class of Cisco will sustain Lake Superior's food web, as well as its fisheries for the next 15-20 years.

Upper Great Lakes Management Unit's Cisco Hydroacoustic Survey

In addition, the Ministry utilizes hydroacoustic technology in conjunction with suspended gill-nets to estimate spawning adult Cisco abundance. This information is used in stock status reporting and commercial quota management in Ontario waters of Lake Superior. It is evident that adult abundance is much lower in Black Bay with estimates of approximately 50 fish/ha, compared to nearly 300 fish/ha in Thunder Bay (Figure 19).

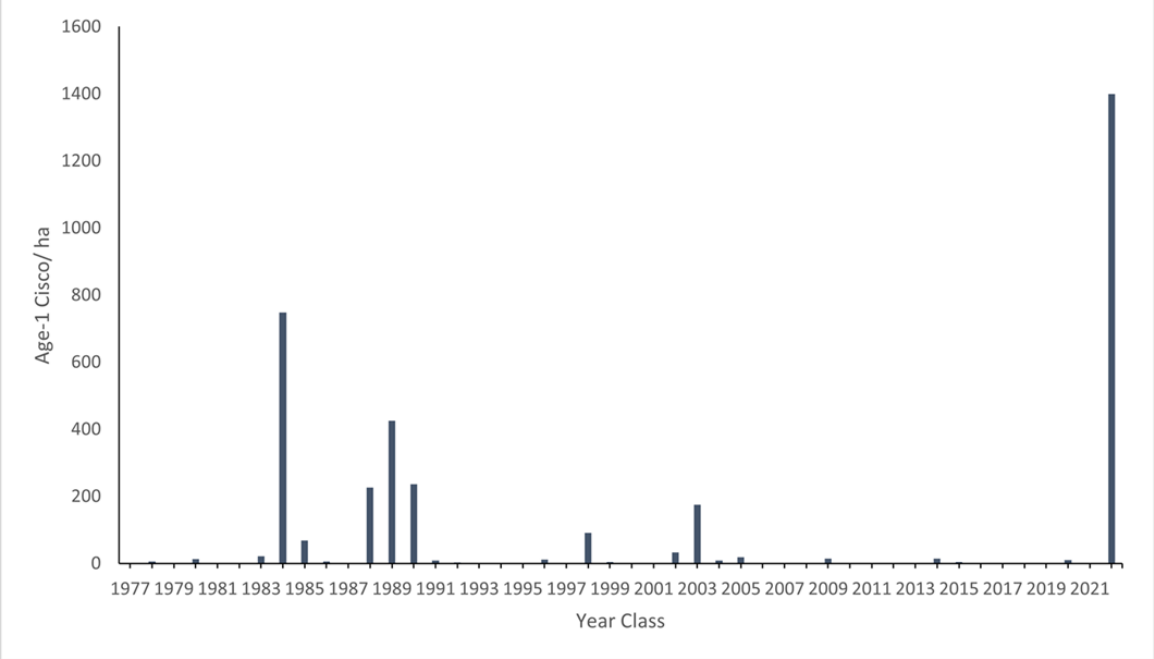

Figure 18. USGS Cisco recruitment index (Age 1 Cisco/Ha) from 1977-2022.

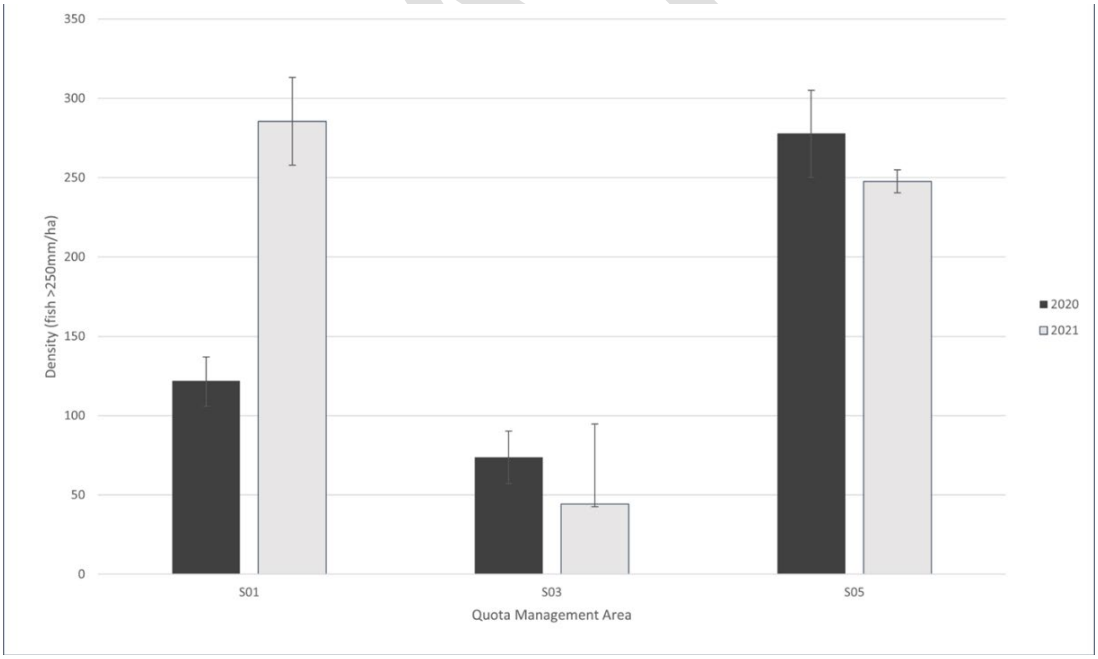

Figure 19. Estimates of adult spawning Cisco abundance (2020 and 2021) from the Ministry's hydroacoustic survey.

Cisco Background Information Summary

- Little to no commercial effort or harvest since 2020.

- Sporadic recruitment which is a lake-wide phenomenon.
- Record breaking 2022-year class with an estimated 2 billion age-0 Cisco lake-wide in 2023.

Cisco Issues Identification

1. Sporadic recruitment events that can lead to declines in lake-wide biomass / densities.
2. Climate change and possible impacts on recruitment as found through a USGS model which predicts ice cover and cold spring water temperatures as the main factors to produce a strong year class.
3. Data Gaps (no hydroacoustic survey conducted since 2021 in Black Bay and no commercial catch data since 2020 in Black Bay).

Cisco Ecological Objective

1. Manage/maintain Cisco in Black Bay in a manner that allows the population to continue to support large numbers of predators.

Cisco Ecological Target

1. Adult biomass is greater than 45 fish/ha as seen in the Ministry's hydroacoustic survey.

Cisco Socioeconomic Objective

1. Manage Cisco in a manner that provides long-term sustainable commercial and recreational opportunities as well as benefits as a food source for predators.

Cisco Socioeconomic Target

1. Maintain commercial harvest below the annual quota allocation.

Cisco Actions and Strategies

1. Monitor adult Cisco abundance in Black Bay more frequently if commercial fishing effort increases.
2. Continue to work with and support the USGS bottom trawl survey.
3. Collect fisheries independent data on Cisco.

4. Adjust quotas in accordance with the Province's Strategic Policy for Ontario's Commercial Fisheries (2011).

8.9 Chinook Salmon

Chinook Salmon Background Information

Chinook Salmon are a popular sport fish species that are native to the Pacific Ocean and were first introduced into Lake Superior in the late 1800's. US state fisheries management agencies stocked Chinook Salmon annually into Lake Superior between the 1970's and early 2000's. Since then, stocking has decreased significantly to point where the only Chinook Salmon stocking in Lake Superior is conducted by a private club in Thunder Bay, Ontario as populations across the lake are self-sustaining and supported by wild reproduction (Figure 20). The south end of Black Bay hosts a popular open water recreational fishery that targets Chinook Salmon. In the summers of 2013 and 2014 the Ministry conducted an access creel survey at four well used boat launches in Black Bay to collect harvest and effort data on the Black Bay recreational fishery. Estimated CPUE varied from 0.301 in 2013 to 0.187 in 2014 with nearly all fish that were caught being harvested (Table 3 and 4). No other Chinook Salmon surveys have been conducted on Black Bay, so information is limited. However, anglers describe recent Chinook Salmon fishing in Black Bay as very poor for the past several years.

Chinook Salmon Background Information Summary

- The Thunder Bay Salmon Association (TBSA) stocks Chinook Salmon annually.
- The Chinook Salmon population in Black Bay is self-sustaining and supported by natural reproduction.
- Popular recreational fishery in the south end of Black Bay.
- High rate of harvest of fish that are caught.
- Recent, perceived low abundance by recreational anglers.

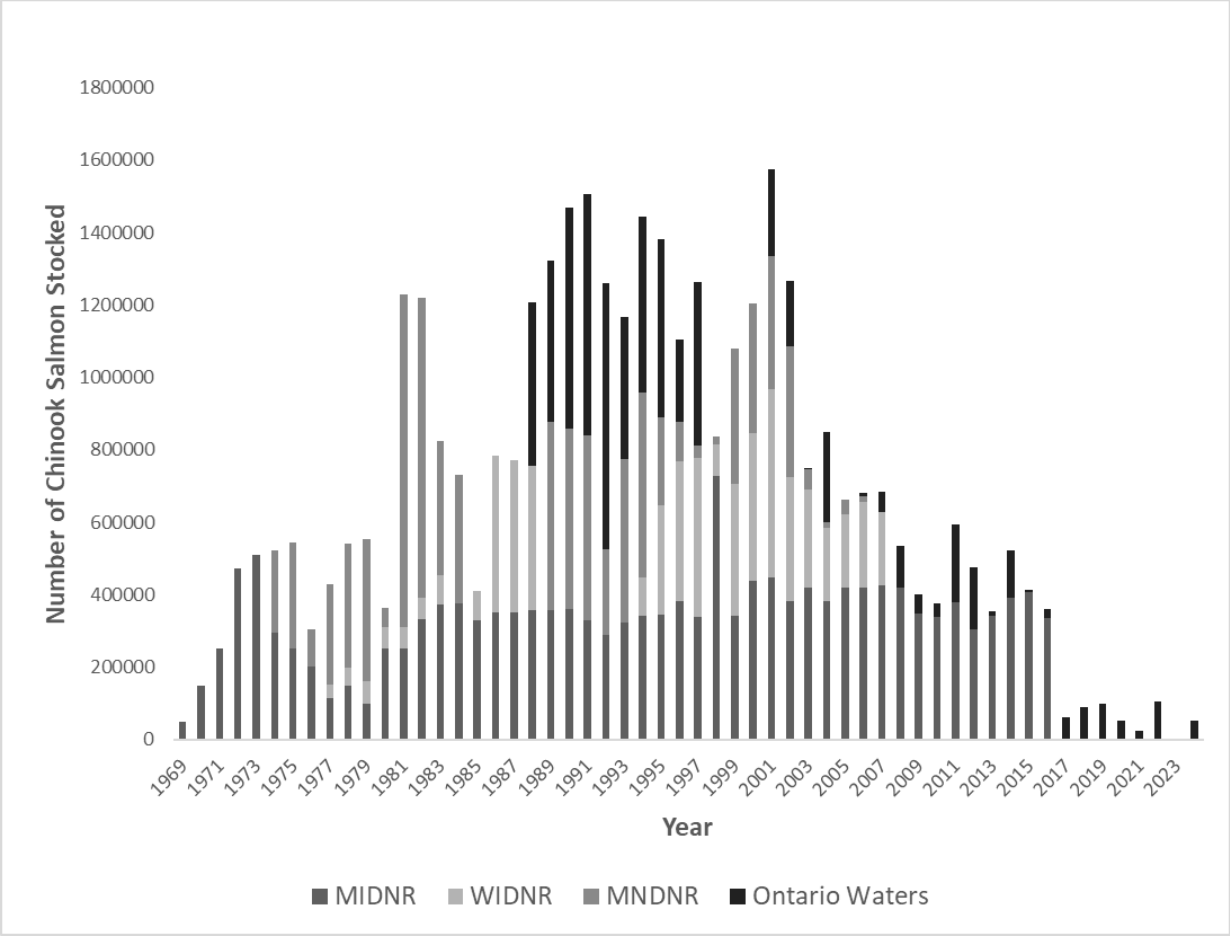

Figure 20. Chinook Salmon stocking by Lake Superior fisheries management agencies.

Table 3. Chinook Salmon effort, catch and CPUE results from the 2013 Black Bay access creel survey.

Chinook Salmon	All	Hurkett	Pearl Harbour	Dock 5	Silver Islet
Estimated Effort (Rod Hours)	383		90	293	
Estimated Harvest	103		11	93	
Observed Catch	24		1	23	
Estimated Catch	105		11	95	
% Kept	98		100	98	
Observed CPUE (Targeted)	0.252		0	0.301	
Estimated CPUE (Targeted)	0.242		0	0.317	

Table 4. Chinook Salmon effort, catch and CPUE results from the 2014 Black Bay creel survey.

Chinook Salmon	All	Hurkett	Pearl Harbour	Dock 5	Silver Islet
Estimated Effort (Rod Hours)	847		63	784	
Estimated Harvest	146		0	146	
Observed Catch	31		0	31	
Estimated Catch	146		0	146	
% Kept	100		n/a	100	
Observed CPUE (Targeted)	0.106		0	0.118	
Estimated CPUE (Targeted)	0.173		0	0.187	

Chinook Salmon Issues Identification

1. Apparent decline in the population over the past few years. Low numbers of fish being caught by anglers.
2. High potential harvest with a five fish limit being too high.
3. Possible low recruitment due to environmental conditions (low fall water levels and high-water temperatures during the fall spawning months)
4. Poor survival of fish that are caught. Fish need to be released immediately if they are to be released.
5. Fewer anglers fishing compared to past years.

Chinook Salmon Ecological Objectives

1. Increase Chinook Salmon numbers in Black Bay in a manner that is compatible with the management and rehabilitation goals for native species in Black Bay.
2. Maximize the adult spawning stock and biomass.

Chinook Salmon Ecological Target

1. CPUE greater than 0.2 fish/hour as seen in the 2013/14 Black Bay Access Creel Surveys.

Chinook Salmon Socioeconomic Objective

1. Reduce harvest in the recreational fishery.

Chinook Salmon Socioeconomic Target

2. Increase angler satisfaction.

Chinook Salmon Actions and Strategies

1. Reduce the daily allowable catch limit for Chinook Salmon. To be implemented at a lakewide level through the FMZ 9 Council.
2. The Ministry to conduct open water creel surveys on Black Bay to monitor catch/harvest and effort from the recreational fishery.
3. Work with the Thunder Bay Salmon Association to increase the survival of their stocked fish.
4. Educate anglers regarding the impacts of high harvest rates on natural reproducing salmonid populations.

8.10 Brook Trout

Brook Trout Background Information

Brook trout are a coldwater fish species that are popular amongst sport anglers in the region. Populations of brook trout in Lake Superior are often referred to as "coasters" due to their behavioural tendencies to utilize both tributary and lake habitats for various aspects of their life history. Black Bay and several of its tributaries are known to have populations of coaster and stream resident brook trout. Despite their popularity, very little data specific to Black Bay Brook Trout have been collected.

Brook Trout Background Summary

- Little data specific to Brook Trout from Black Bay has collected.
- Known coaster Brook Trout spawning populations in several Black Bay tributaries.

Brook Trout Issues Identification

1. Lack of sufficient data**.**
2. Concerns with climate change and its impacts on coldwater fish species.

Brook Trout Ecological Objective

1. Maintain the current state of the fishery.
2. Learn more of about the stock status of brook trout in Black Bay.

Brook Trout Ecological Target

1. Develop a target CPUE based on the Ministry's coaster Brook Trout boat electro-fishing survey.

Brook Trout Socioeconomic Objective

1. Maintain the current state of the recreational fishery.

Brook Trout Actions and Strategies

1. Increase available data by expanding various monitoring programs/surveys into Black Bay.
2. Collect information on Black Bay Brook Trout population by conducting fisheries independent assessment surveys.

8.11 Smallmouth Bass

Smallmouth Bass Background Information

Smallmouth Bass are a warmwater fish species that are typically limited to warmer embayment's in Lake Superior. Smallmouth Bass are known to inhabit Black Bay, especially in the north end of the bay. FWIN and BsM surveys do catch Smallmouth Bass in low numbers as larger individuals are not as susceptible to gillnets. It appears there has been minor increase in CPUE since 2002, but CPUE has ranged between 1 fish/km to 2.8 fish/km in the past six gill-netting surveys (Figure 21). Anecdotal information collected in discussions with local anglers suggests that Smallmouth Bass are being caught in good numbers with many large fish that would rival other popular Smallmouth Bass fisheries in the region.

Smallmouth Bass Background Summary

- Little data specific to smallmouth bass from Black Bay
- Minor increase in overall CPUE (abundance) since 2022 in FWIN and BsM surveys.
- Larger smallmouth bass are not susceptible to mesh sizes in FWIN and BsM nets.
- Black Bay smallmouth bass fishery appears to be increasing in popularity with anglers.

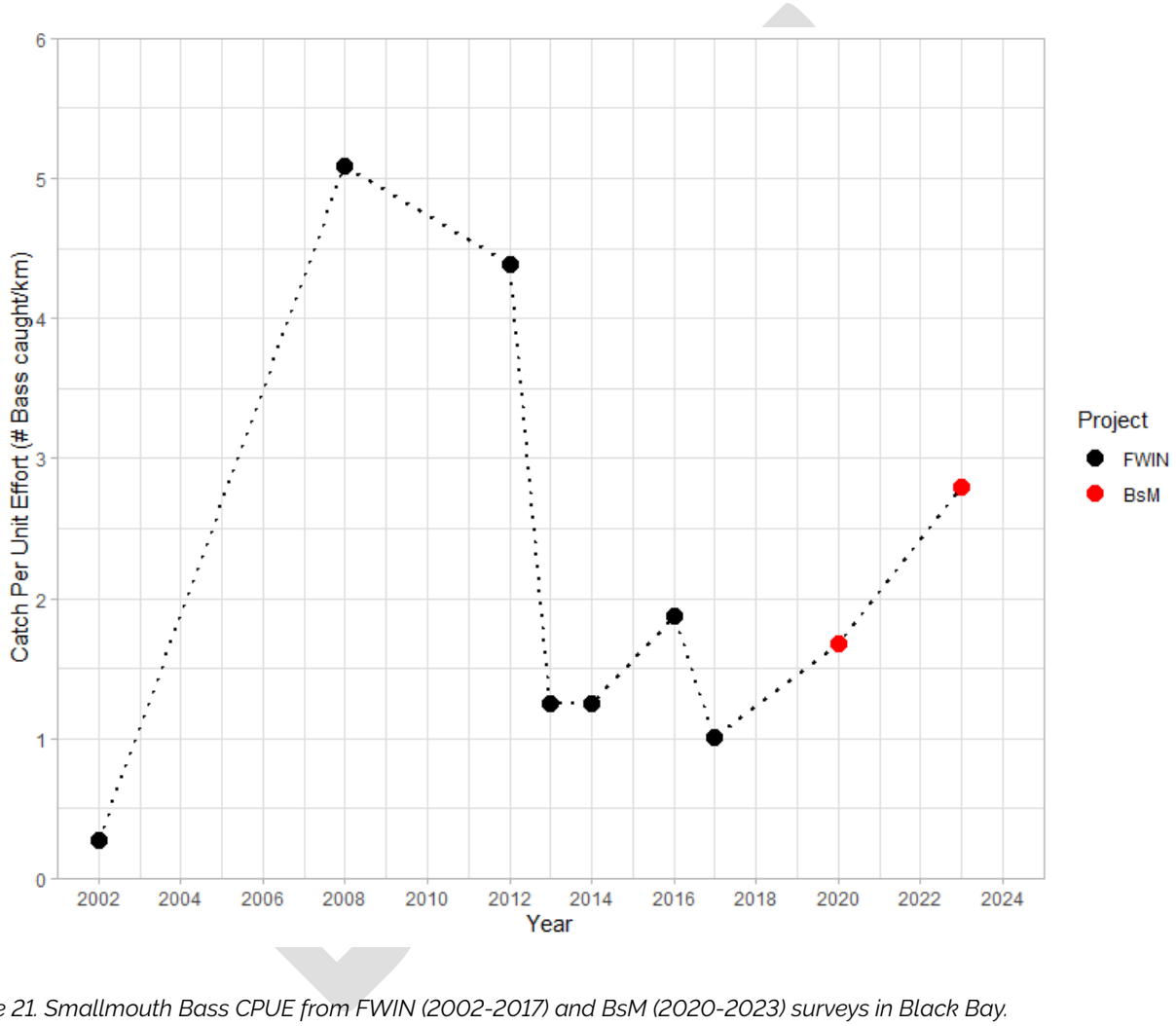

Figure 21. Smallmouth Bass CPUE from FWIN (2002-2017) and BsM (2020-2023) surveys in Black Bay.

Smallmouth Bass Issues Identification

1. Lack of sufficient data.
2. Concerns that climate change and warming water temperatures will lead to smallmouth bass proliferating in Black Bay which may affect other species.

Smallmouth Bass Ecological Objective

1. Maintain the current abundance of Smallmouth Bass as seen in BsM surveys.
2. Develop a target/baseline CPUE based on information collected from End of Spring Trap Netting (ESTN) surveys. As part of the Lake Superior's CSMI schedule.

Smallmouth Bass Ecological Target

1. Smallmouth Bass CPUE from fisheries independent assessment surveys greater than 1 fish/km.
2. Reliable estimate of CPUE based on ESTN survey.

Smallmouth Bass Socioeconomic Objective

1. Gain insight and information on the dynamics of the Smallmouth Bass recreational fishery.

Smallmouth Bass Socioeconomic Target

1. Develop reliable estimates of catch, effort and CPUE from the targeted Smallmouth Bass recreational fishery as observed in creel assessments.

Smallmouth Bass Actions and Strategies

1. Increase available data by expanding various monitoring programs/surveys into Black Bay.
2. Initiate independent fisheries assessment surveys in Black Bay as part of Lake Superior's Coordinated Science and Monitoring Initiative (CSMI) in 2026 that will collect information on the Smallmouth Bass population.

8.12 Prey Fish

Prey Fish Background Information

A healthy and diverse prey fish component in the fish community is vital to support top predators in an aquatic ecosystem. The Black Bay native fish community includes an abundant prey component that includes minnows (Cyprinids), suckers (Catostomidae), perches, (Percidae), and Corregonids. Prior to the recovery of predators such as Walleye and

Northern Pike, the prey base was abundant with nearly 2500 individuals being caught per kilometer (Figure 22) in the 2002 FWIN survey. As recovery of top predators progressed, prey abundance declined but has remained stable since 2012. It should be noted that increases of prey abundance seen in 2020 and 2023 are due to the switch to the BsM protocol which has more small-mesh panels then a FWIN net.

Prey Fish Background Information Summary

- Prey abundance has declined since 2002, possibly associated with the recovery of top predators in Black Bay**.**
- However, the prey component of the Black Bay fish community is healthy and supporting a large number of predators.

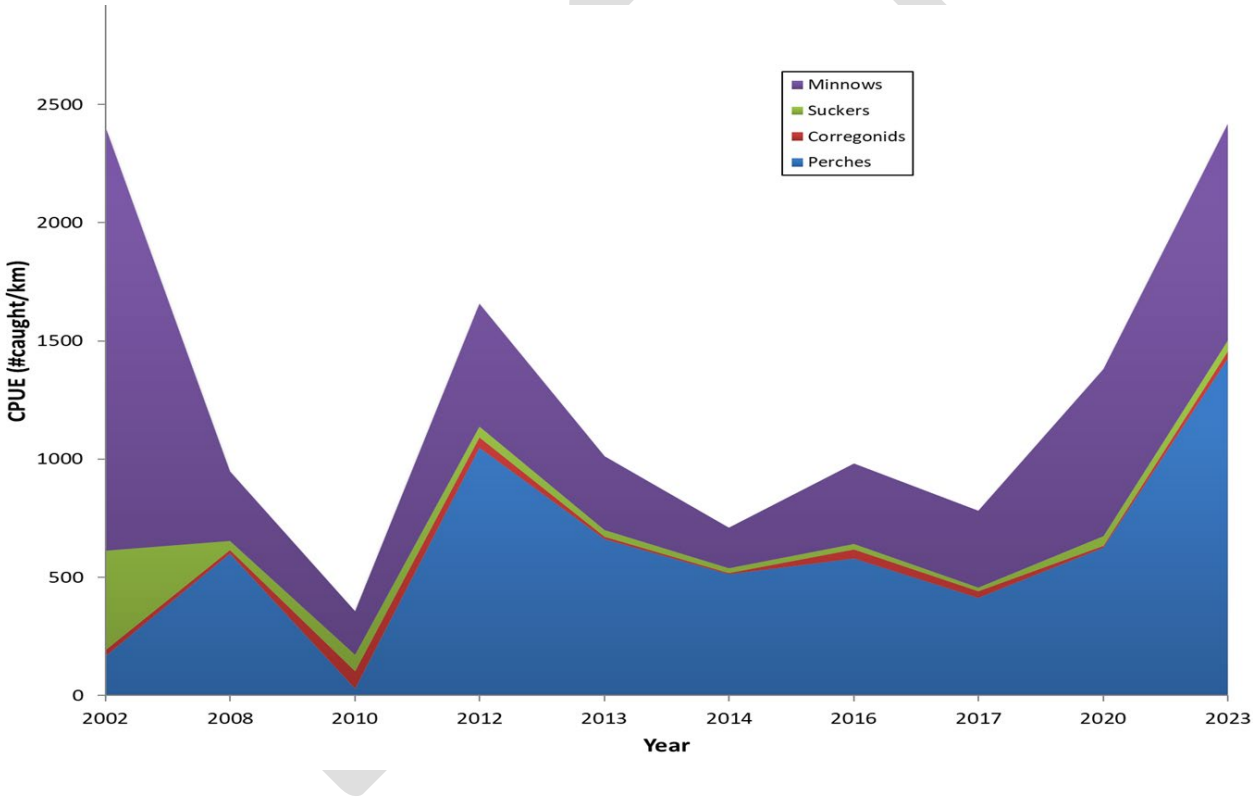

Figure 22. Prey species composition from FWIN (2002-2017) and BsM (2020-2023) surveys.

Prey Fish Issues Identification

1. None identified as the prey fish community appears stable and is supporting a large number of predators. The Ministry will continue to monitor the prey base through BsM surveys.

Prey Fish Ecological Objective

1. N/A.

Prey Fish Socioeconomic Objective

1. N/A

8.12 Aquatic Invasive Species

Aquatic Invasive Species Background Information

Aquatic invasive species (AIS) are a serious threat to ecosystems (Lower, E., et. al., 2024). Currently six known aquatic invasive fish species inhabit Black Bay, including Alewife (*Alosa pseudoharengus*) (present in low abundance), Eurasian Ruffe (*Gymnocephalus ceruna*), Rainbow Smelt (*Osmerus mordax*), Three-Spine Stickleback (*Gasterosteus aculeatus*) and Sea Lamprey (*Petromyzon marinus*). Rainbow Smelt appear to the most abundant and widespread in the bay as seen in FWIN and BsM surveys (Figure 23). The notable increase in both Rainbow Smelt and Eurasian Ruffe in 2020 and 2023 can again be attributed to the switch to the BsM protocol and small-mesh nets. Another threat to Black Bay is the potential invasion/colonization of *Dreissenid* mussels (Zebra and Quagga mussels). Western Nipigon Bay which is situated to the northeast of Black Bay is known to have the largest and most widespread colonization of *Dressenid* mussels in Lake Superior. *Dreissenid* mussels can negatively impact the ecosystem by removing plankton food sources for native fish and altering water clarity.

Aquatic Invasive Species Summary

- Alewife, Eurasian Ruffe, Common Carp, Rainbow smelt, Three Spine Stickelback, and Sea Lamprey are all known to be present in Black Bay. Some invasive species may now be important prey species that help support predatory populations.
- Rainbow smelt and Eurasian Ruffe abundance appears to have increased but is attributed to the switch to BsM nets.

- Concerns with possible *Dreissenid* mussel (Zebra and Quagga mussel) colonization from Nipigon Bay.

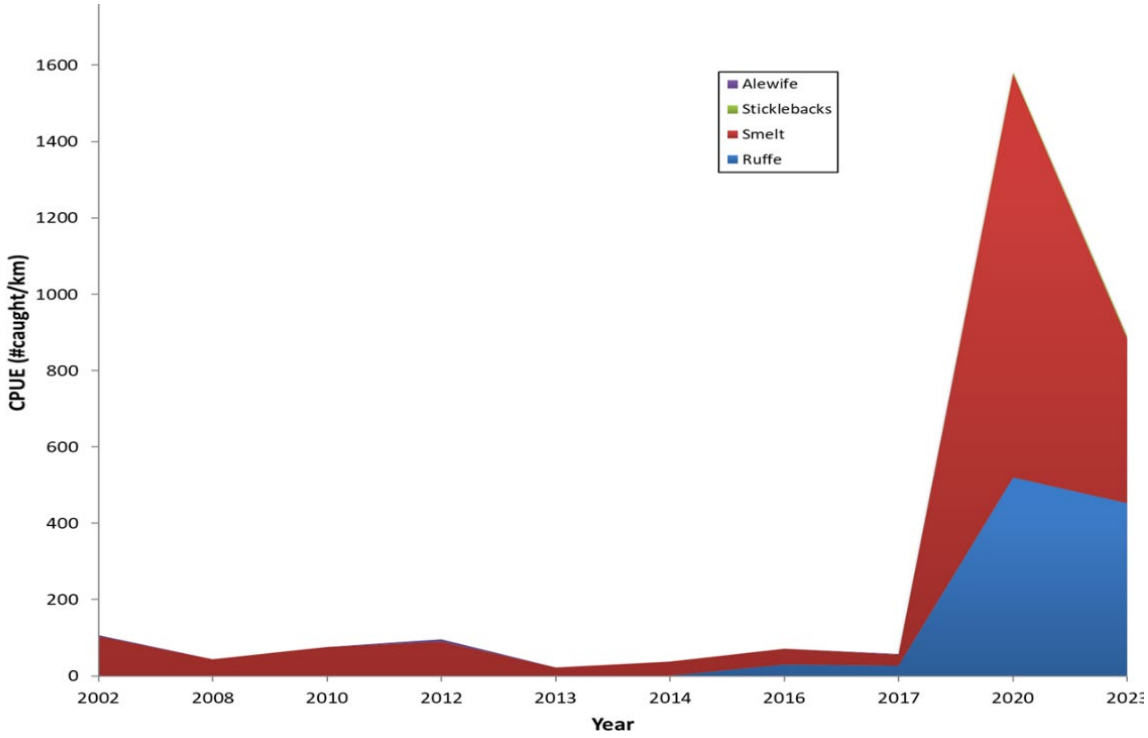

Figure 23. Aquatic invasive fish species composition / CPUE from FWIN (2002-2017) and BsM (2020-2023) surveys.

Aquatic Invasive Species Issues Identification

1. The potential invasion of Dreissenid mussels into Black Bay.

Aquatic Invasive Species Ecological Target

1. N/A

Aquatic Invasive Species Socioeconomic Objective

1. Mitigate the potential for new invasive species in Black Bay by educating the public about the threats of aquatic invasive species.

Aquatic Invasive Species Socioeconomic Target

1. No (0) new aquatic invasive species in Black Bay.

Aquatic Invasive Species Actions and Strategies

1. Increased communication and education with the public regarding the importance of cleaning boats/disinfecting live wells to reduce/eliminate movement of invasive species.
2. Increased communication and education with the public regarding the potential negative effects that various invasive species can have on ecosystems.
3. Increased signage at public boat launches.
4. Conduct the Lake Superior aquatic invasive species early detection and monitoring survey on Black Bay during the Coordinated Science and Monitoring Initiative (CSMI) rotation (next CSMI year is 2026).

8.13 Walleye

Walleye Background Information

Walleye are a widespread coolwater species that are highly sought after in Indigenous, recreational, and commercial fisheries across Ontario. As previously discussed, prior to the collapse in the late 1960's, Black Bay once supported the largest population of Walleye in the Ontario waters of Lake Superior. The province has been actively involved in rehabilitation efforts since the early 1970's and has been intensively monitoring Walleye recovery in Black Bay since 2002 using FWIN and BsM surveys, as well documenting movement behaviour using acoustic telemetry technology.

Fall Walleye Index Netting and Broadscale Monitoring Surveys

Between 2002 and 2008 adult Walleye (>350 mm total length) biomass/abundance in Black Bay increased from less than 10,000 kg in the 2002 FWIN survey to more than 100,000 kg in 2008. The most recent estimate from the 2024 BsM survey, found adult biomass to be approximately 115,000 kg (Figure 24). These estimates are believed to be an underestimate as acoustic telemetry studies suggest that approximately 25-30% of the population leaves Black Bay during the time in which BsM surveys are conducted (see next section). Relative to other Great Lakes and inland Walleye populations in northwestern Ontario, abundance of large Walleye (>350 mm) is significantly higher than other populations in Lake Superior and Lake Huron and is comparable to many inland lake populations in FMZ 6 and FMZ 7 (Figure 25).

Total annual mortality is the estimated proportion of fish removed from a population annually due to the combination of natural causes and fishing. Since 2002, total annual mortality has dropped substantially from over 60% to less than 20% presently (Figure 26). Natural annual mortality in a healthy population is typically around 15.6% (Lester et al. 2014) which has been approached in Black Bay recently.

The number of year classes in the Walleye population has also increased. In 2002, four-year classes were represented (age 0 to age 4) with 16 years classes present in the 2023 BsM survey (age 0 to age 19) (Figure 27). The mean age of Walleye captured in FWIN and BsM surveys also increased. The mean age of the fish caught in 2002 was 1.2 years of age and increased to 4.6 years of age in 2017. The mean age of Walleye captured increased to 7.2 and 7.3 years in 2020 and 2023 respectively.

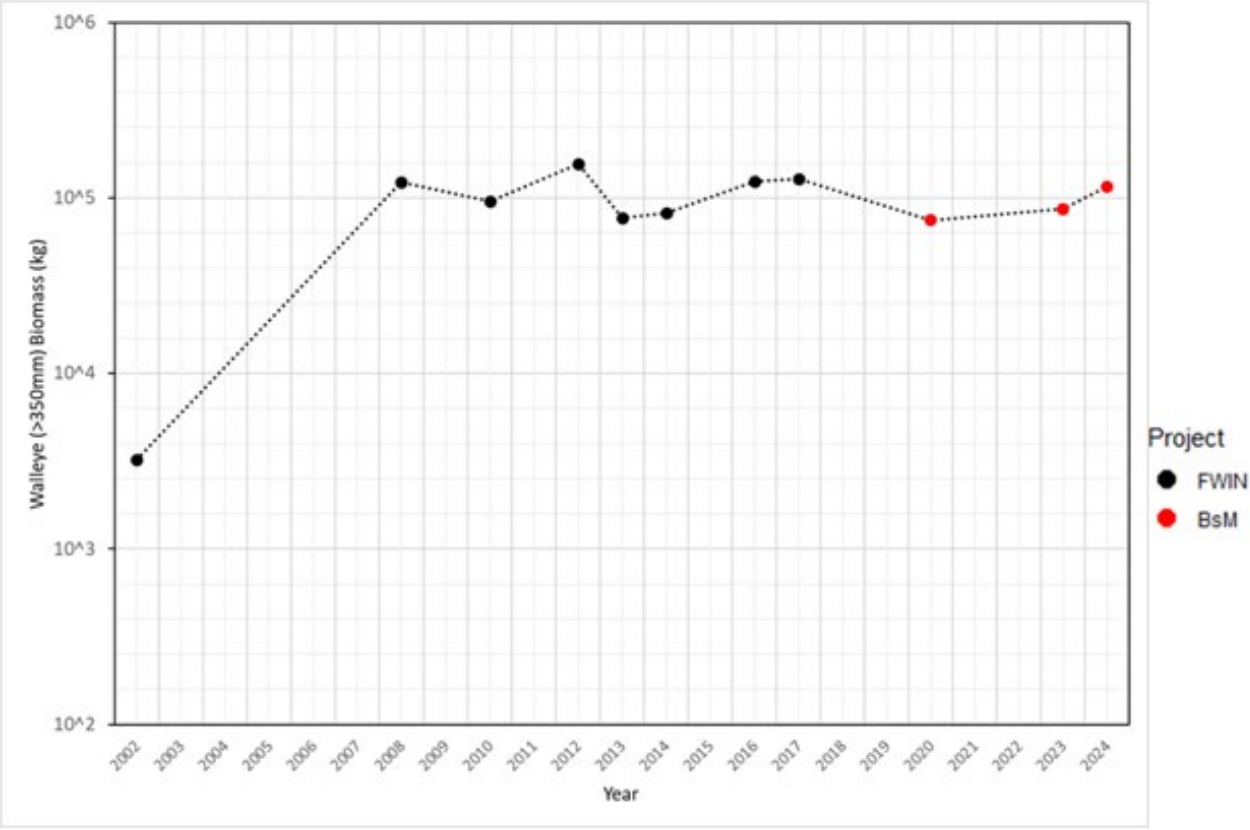

Figure 24. Adult Walleye (>350mm) biomass from FWIN (2002-2017) and BsM (2020-2023) surveys, estimated from CPUE and gillnet catchability coefficients from Giacomini et al. (2020)

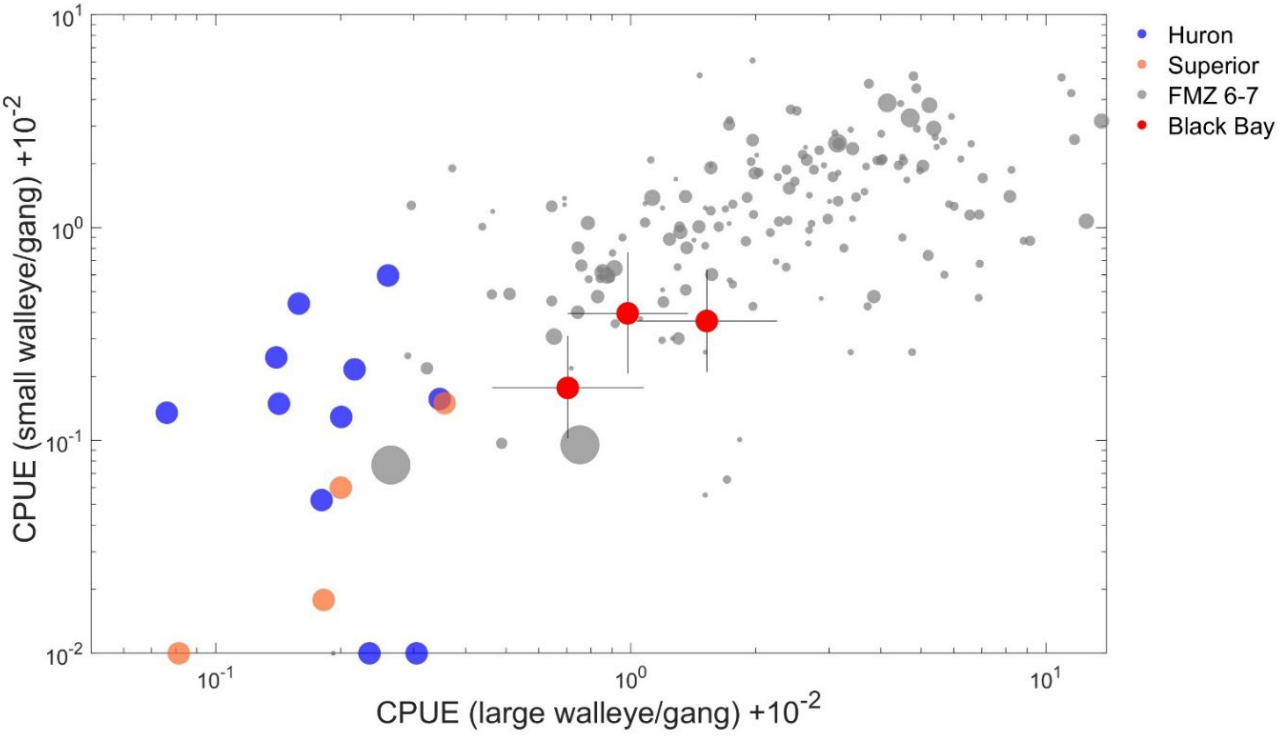

Figure 25. Small (<350 mm) and large (>350 mm) Walleye CPUE from Black Bay BsM surveys relative to other Great Lakes and NW region inland Walleye fisheries. The unit of effort (gang) refers to a gillnet gang of the large mesh (North American) standard used in BsM surveys.

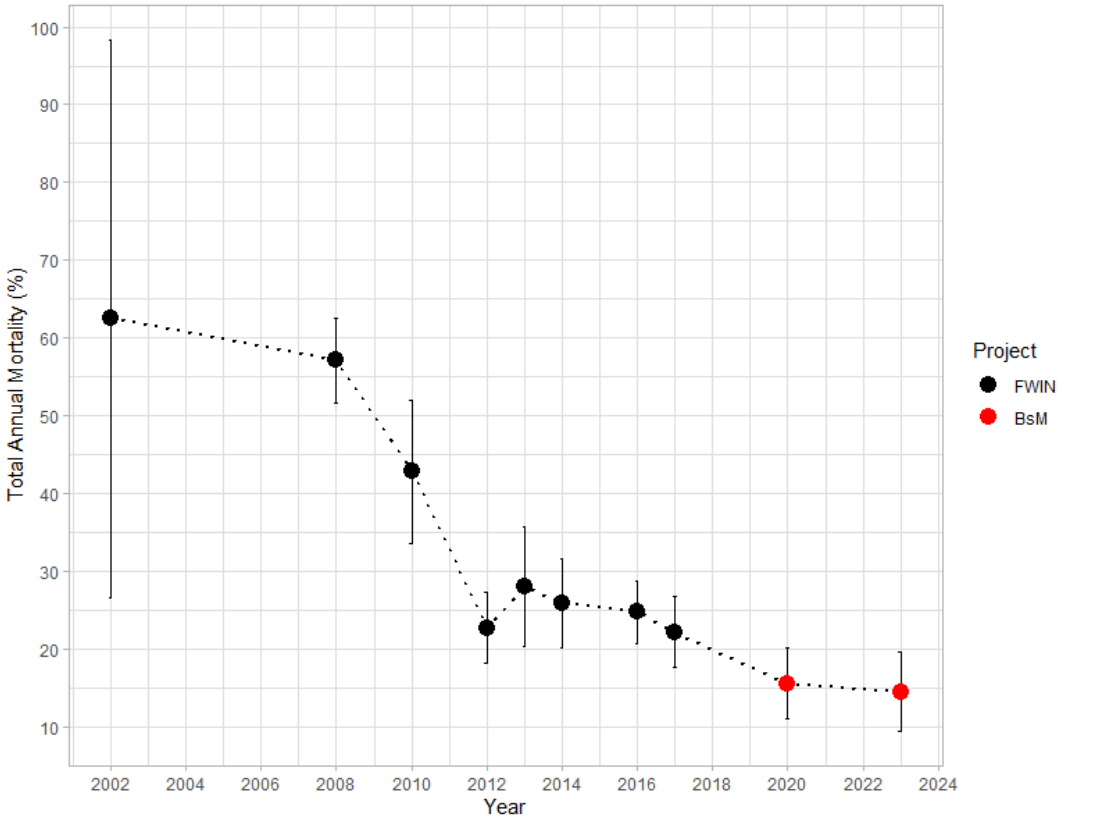

Figure 26. Estimates of total annual mortality of Walleye from FWIN (2002-2027) and BsM (2020-2023) surveys

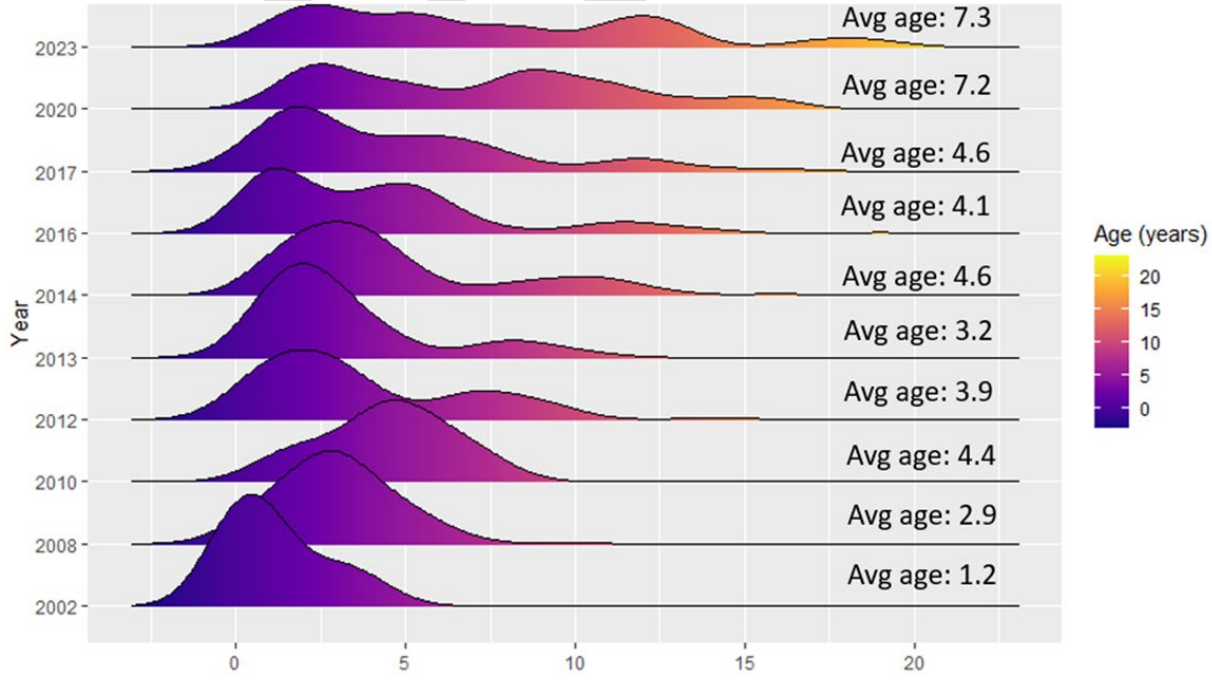

Figure 27. Black Bay Walleye age distribution with mean ages from FWIN (2002-2017) and BsM (2020-2023) surveys.

Black Bay Walleye Acoustic Telemetry Study

Acoustic telemetry is a relatively new tool that is used by fisheries management agencies to monitor the movements of various fish species. Acoustic telemetry involves surgically tagging fish with individually coded acoustic transmitters. Once the fish are released, these transmitters emit a sonic pulse that is detected and recorded by receivers that are deployed on the lakebed within the study area of interest (Crossin et. al., 2017). The Black Bay Walleye Acoustic Telemetry (BBWAT) project was initiated in 2016 by the the Ministry to learn more about Walleye movements and ecology in Lake Superior. Since 2016, 233 Walleye from Black Bay have been implanted with acoustic tags. The key objectives of this study were to:

1. Describe Walleye residency and migration patterns within the bay.
2. Determine timing and locations of Walleye spawning.
3. Determine what proportion of the population would benefit (if any) from access to habitat above the Camp 43 dam.
4. Inform management direction/action for Walleye recovery.

The following is a season-by-season summary of general Walleye movement behaviours within Black Bay:

Walleye Pre-Spawn Behaviour (March-April)

During the late winter and early spring months (March-April) prior to ice-out, Walleye concentrate in the north end of Black Bay in very cold water (<1 degree Celsius) in what appears to be pre-spawn staging (Figure 28).

Walleye Spawning Behaviour (April – May).

Between mid-April to mid-May, Walleye in the north end of the bay become more active and start to exhibit signs of spawning behaviour. Once water temperatures in the Black Sturgeon River rise above 1 degree Celsius, Walleye will begin to migrate up the river to spawn. In a typical year, approximately 50% of the 233 individually tagged Walleye in Black Bay migrated up the Black Sturgeon River. The remaining tagged fish appear to remain in the Northwest corner of the bay which suggests there could be in lake/shoal spawning occurring. However, this has not been confirmed. Of the fish that migrated into the Black Sturgeon River, the

majority do not go beyond the rapids at the highway 11/17 bridge, with only 1.2% to 7.8% migrating to the Camp 43 dam in a typical year (Figure 29, Table 5). The fish that do migrate to the Camp 43 dam typically do so in mid-to-late May or early June, which is after most fish have typically left the river.

Walleye Post-Spawn Behaviour (Late May to Late June)

Following the spawning period in mid-May, Walleye begin to travel back and forth along the shoreline in the north end of Black Bay. This continues for multiple weeks until the fish begin to disperse southward in the bay primarily along the western shoreline (Figure 30).

Walleye Summer and Fall Behaviour (June to September)

Throughout the summer, Walleye continue to disperse throughout Black Bay with nearly 70% of tagged fish moving south of the boundary for the recreational fishery at Bent Island. Furthermore, approximately 25% of the tagged Walleye leave Black Bay at some point in the open water season; of those, 18% head west towards Thunder Bay and 5% moved east towards Nipigon Bay (Figure 31). These results have been consistent throughout the entirety of the study. It should be noted that because of these movement patterns it was discovered that abundance estimates derived from BsM surveys are likely underestimated, as upwards of 25% of the Walleye population is not in Black Bay at the time of the survey in late summer.

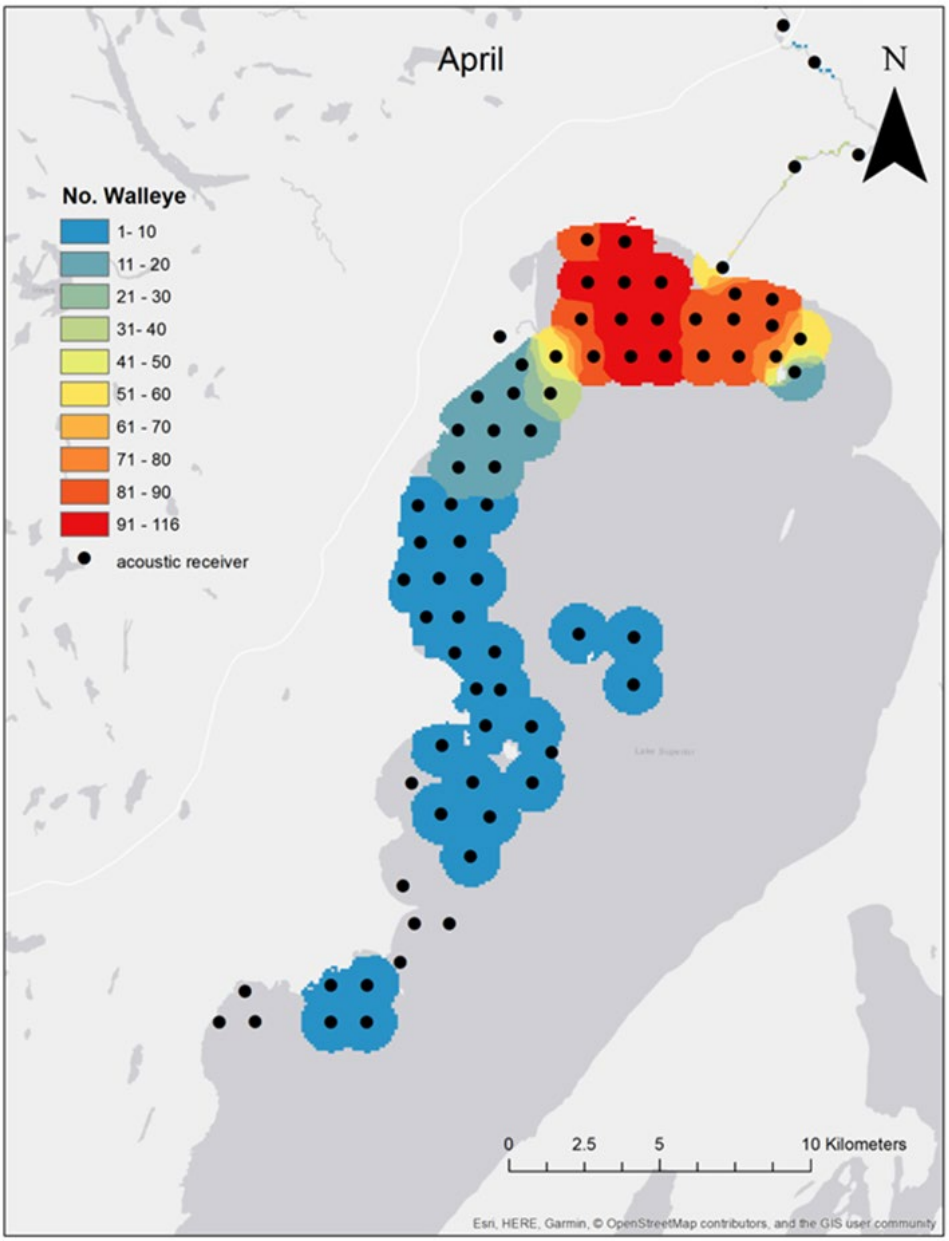

Figure 28. Typical Walleye densities/concentrations in the north end of Black Bay during the pre-spawn season (March/April).

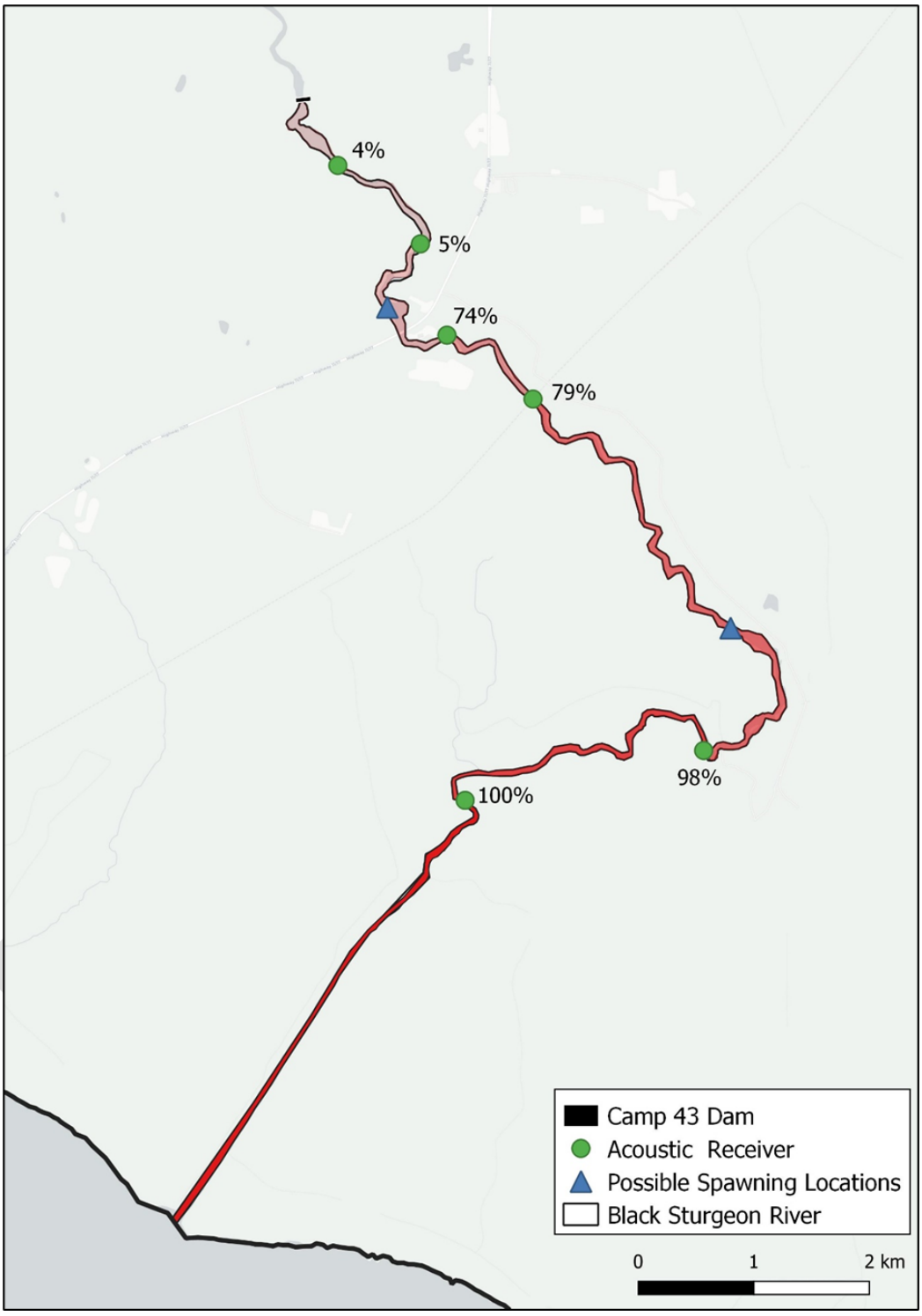

Figure 29. Map showing receiver locations and the relative proportion of tagged Walleye that are assumed to have spawned in the Black Sturgeon River from 2016-2021.

Table 5. Proportion of acoustically tagged Walleye in the Black Sturgeon River that were detected at the Camp 43 dam.

Year	# of Walleye Detected Upstream of the Mouth	# of Walleye Detected at the Camp 43 Dam	% Detected at the Camp 43 Dam
2018	75	4	5.3
2019	85	1	1.2
2020	71	2	2.8
2021	77	6	7.8
2022	53	3	5.6

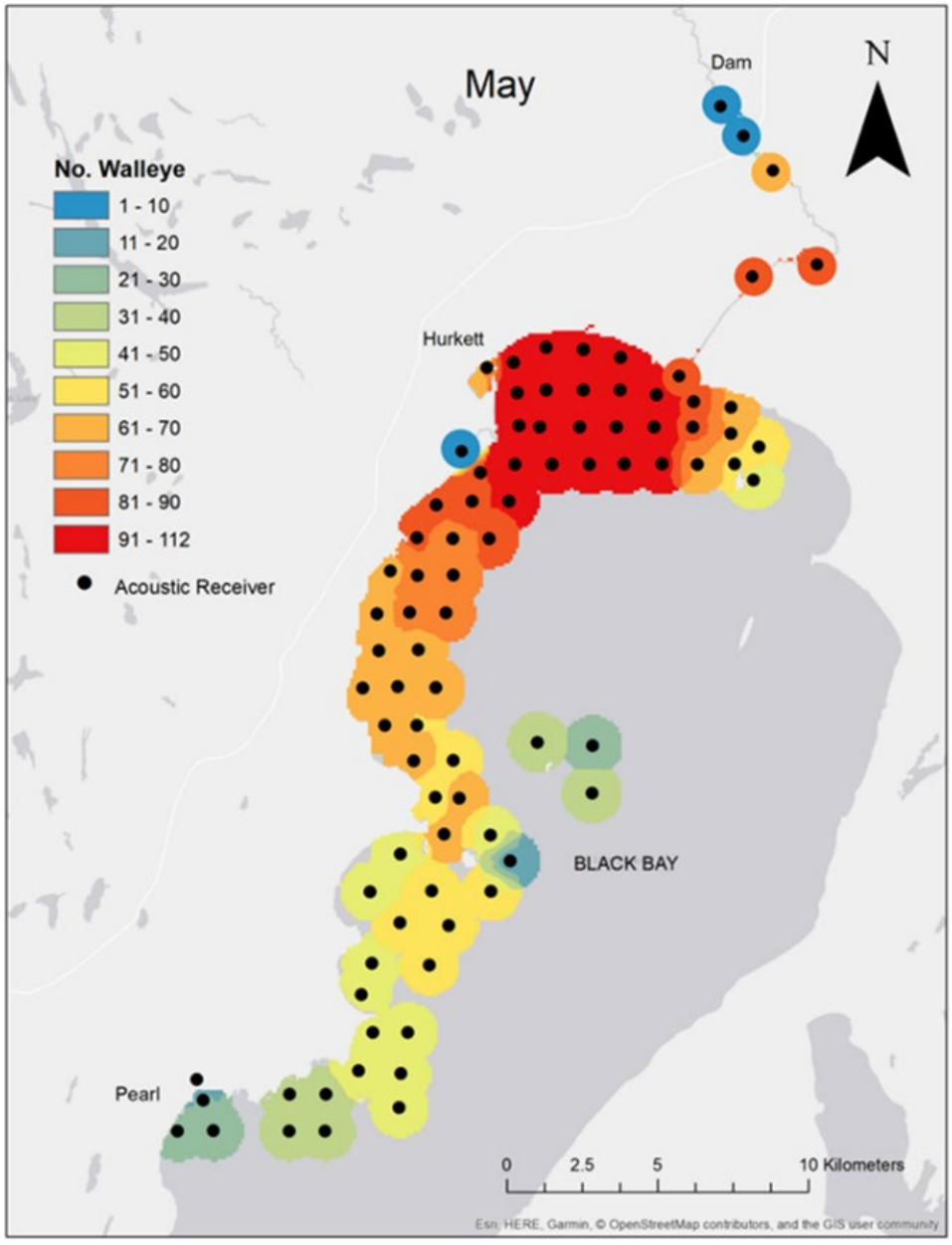

Figure 30. Walleye detections by receiver during the post-spawn period.

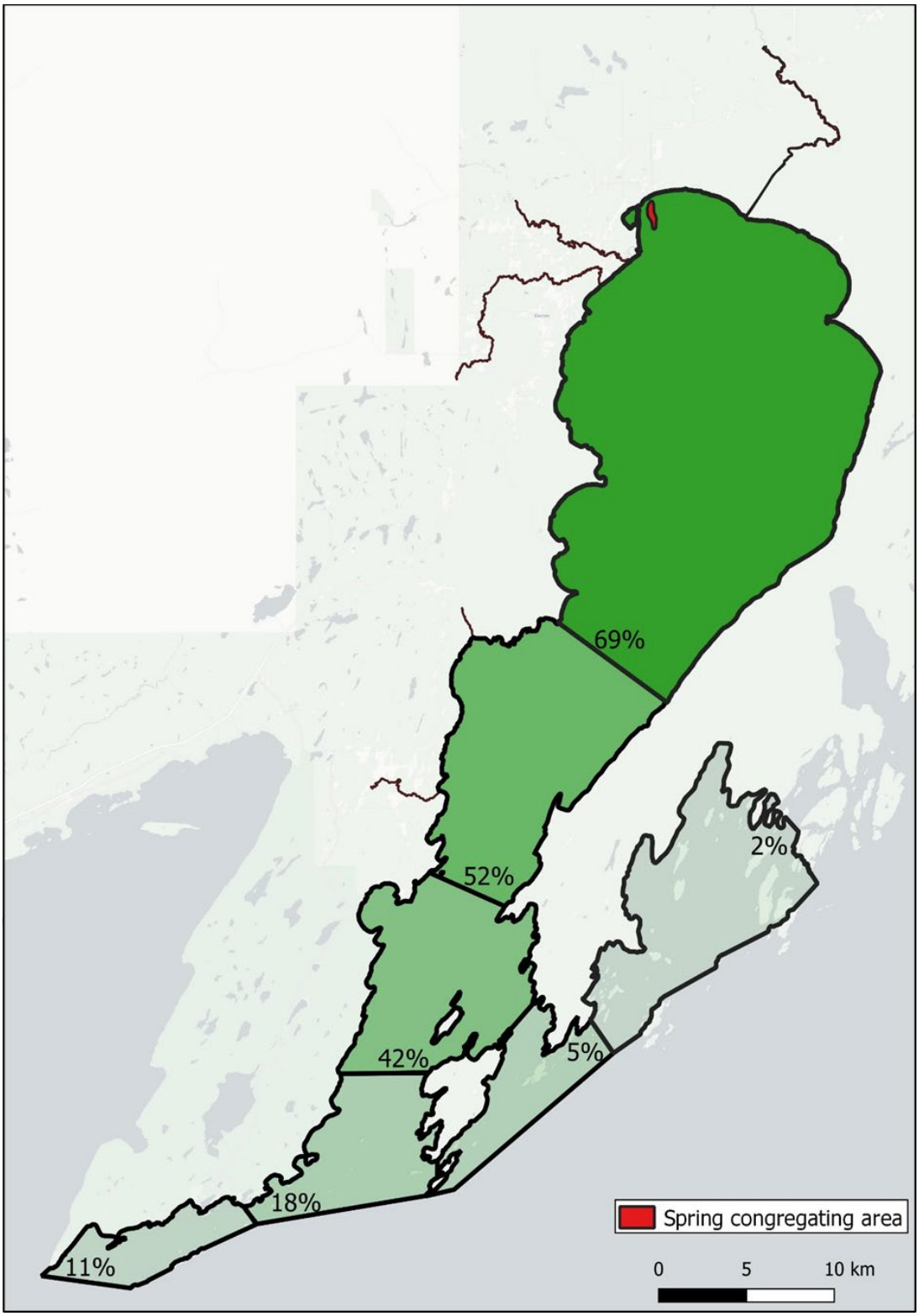

Figure 31. Map showing the relative proportion of all tagged Walleye detected at acoustic receiver gates inside, and adjacent to, Black Bay, Lake Superior from 2016-2021; and an early spring congregating area (red) for Walleye that was determined using VEMCO Positioning System (VPS) analysis, during 2020 and 2021.

Walleye Background Information Summary

- Adult Walleye biomass has increased significantly since 2002.
- Total annual mortality is low; less than 20%.
- Walleye abundance in Black Bay is higher than other Walleye populations in Lake Superior and Lake Huron and similar to inland populations from lakes in FMZ 6 and FMZ 7.
- The population is self-sustained, shows a healthy age and size structure, and is potentially compatible with a well managed fishery
- Consistent seasonal migrations within and out of Black Bay.
- NW corner of Black Bay is a very important area for pre-spawn Walleye, possibly spawning Walleye, and post-spawn Walleye.
- Most Walleye that enter the Black Sturgeon River don't go beyond the rapids upstream from HWY 11/17 – only a small proportion of Walleye reach the Camp 43 Dam
- The majority of Walleye leave the current sanctuary at some point during the year.

Walleye issues Identification

- Concerns with the state and speed of Walleye recovery; some working group and First Nation members feel that recovery has not fully occurred yet while others feel recovery is evident and a conservative fishery is possible.
- Dissatisfaction from anglers that they cannot fish in the north end of the bay.
- Concerns that if Walleye continue to increase in abundance that they may have a negative impact on other species in the fish community (e.g. Rainbow Trout that have declined along with the increase in Walleye).

Walleye Ecological Objective

1. Maintain the current (or better) stock status of Walleye as seen in the 2020, 2023 and 2024 BsM surveys.

Walleye Ecological Targets

1. Adult Walleye biomass (>350mm) is greater than 87,000kg.
2. Minimum of 14-year classes present in the population.
3. Mean age of Walleye caught in independent fisheries assessment surveys is greater than 7.
4. Total annual mortality is less than 29%.

Walleye Socioeconomic Objectives

1. The provision of recreational angling opportunities at a level that maintains sustainable total annual mortality levels.
2. Provide appropriate quantities of non-targeted Walleye by-catch quota in the commercial fishery at levels that are not detrimental to the Walleye population and the fish community.

Walleye Socioeconomic Targets

1. Total annual Walleye mortality for Walleye should be below 29%, as determined by BsM gill-netting surveys.
2. Increase non-targeted Walleye quota to 1500kg annually up from 652kg annually.

Walleye Actions and Strategies

1. Change the recreational Walleye regulation from closed all season from 48˚ 27. N (Bent Island) northward to:
    - Walleye Open Season from July 1st to December 31st for the entire bay.
    - Walleye Two fish daily catch and possession limit
    - Walleye Harvestable slot size of 400-508mm (16"-20").
2. Implement a small increase in allowable Walleye by-catch quota in the commercial fishery that is not detrimental to the walleye population and the fish community.
3. Conduct BsM surveys.
4. Conduct winter and/or open water creel surveys.

5. If adult biomass falls below 87,000kg and total annual mortality is greater than 29% over two consecutive monitoring cycles, the Black Bay FMP working group will be convened and options discussed for the fishery.

8.14 Lake Sturgeon

Lake Sturgeon Background Information

Lake Sturgeon are Ontario's largest and longest living fish. Overexploitation and habitat loss led to dramatic declines in their populations across the province, including the Great Lakes. This led to the Committee on the Status of Species at Risk in Ontario (COSSARO) assigning the Great Lakes-Upper St. Lawrence population(s) as threatened under the Endangered Species Act (ESA) (Golder Associates Ltd., 2011). As such, there are provisions that prohibit individuals from killing or harassing listed species. Currently, the Ministry of the Environment, Conservation and Parks (MECP) are the lead on Species at Risk in the province. Because Lake Sturgeon are listed under the Endangered Species Act, which identifies management processes and approaches there was no need for this plan to consider additional measures to protect sturgeon in Black Bay. A requirement of the Endangered Species Act is the development of a recovery strategy. The Lake Sturgeon recovery strategy was completed in 2011 and outlines the main objectives to achieve protection and recovery of Lake Sturgeon (Golder Associates Ltd., 2011).

To read more about the Lake Sturgeon Recovery Strategy, visit Lake Sturgeon Recovery Strategy | ontario.ca

As part of Lake Superior's CSMI efforts, the Ministry contributes to the lake-wide juvenile sturgeon index netting survey that is conducted at the mouths of tributaries that have existing or extirpated populations, including the Wolf and Black Sturgeon Rivers in Black Bay. When compared to other populations across Lake Superior, CPUE of the Black Bay population appears to be slightly higher than most other populations albeit at very low abundance (Figure 32). As part of the Black Bay acoustic telemetry study, 20 lake sturgeon were implanted with acoustic tags in order track their movements and behaviour. Unlike Walleye, it appears that most lake sturgeon inhabit Black Bay for the entire year with approximately 50% of tagged fish remaining in the north end of the bay (Figure 33). During their spawning migrations, Lake Sturgeon move in and out of the Black Sturgeon River between May and July. Although Lake Sturgeon do not spawn annually, in years when

individuals do migrate into the Black Sturgeon River to spawn, nearly all tagged fish ascend to the Camp 43 dam (Figure 34).

Lake Sturgeon Background Information Summary

- Juvenile Lake Sturgeon abundance is slightly higher than most populations across Lake Superior currently.
- Acoustic telemetry projects indicate most of the tagged fish remain within the Bay with nearly 50% remaining north of Bent Island.
- Of the individuals that enter the Black Sturgeon River, approximately 85% of tagged fish ascend the Black Sturgeon River to the Camp 43 dam during the spawning migration (May-July).

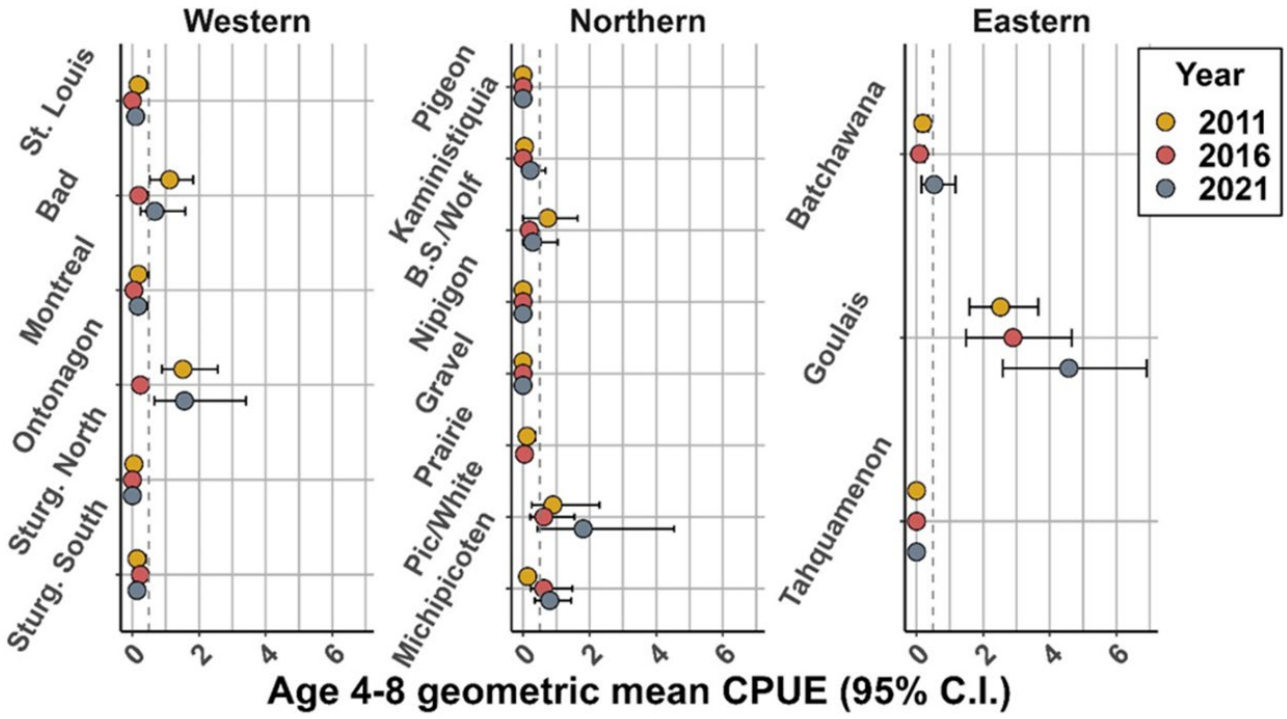

Figure 32. Relative abundance of juvenile lake sturgeon populations in Lake Superior as found in the Lake Superior juvenile lake sturgeon index netting survey.

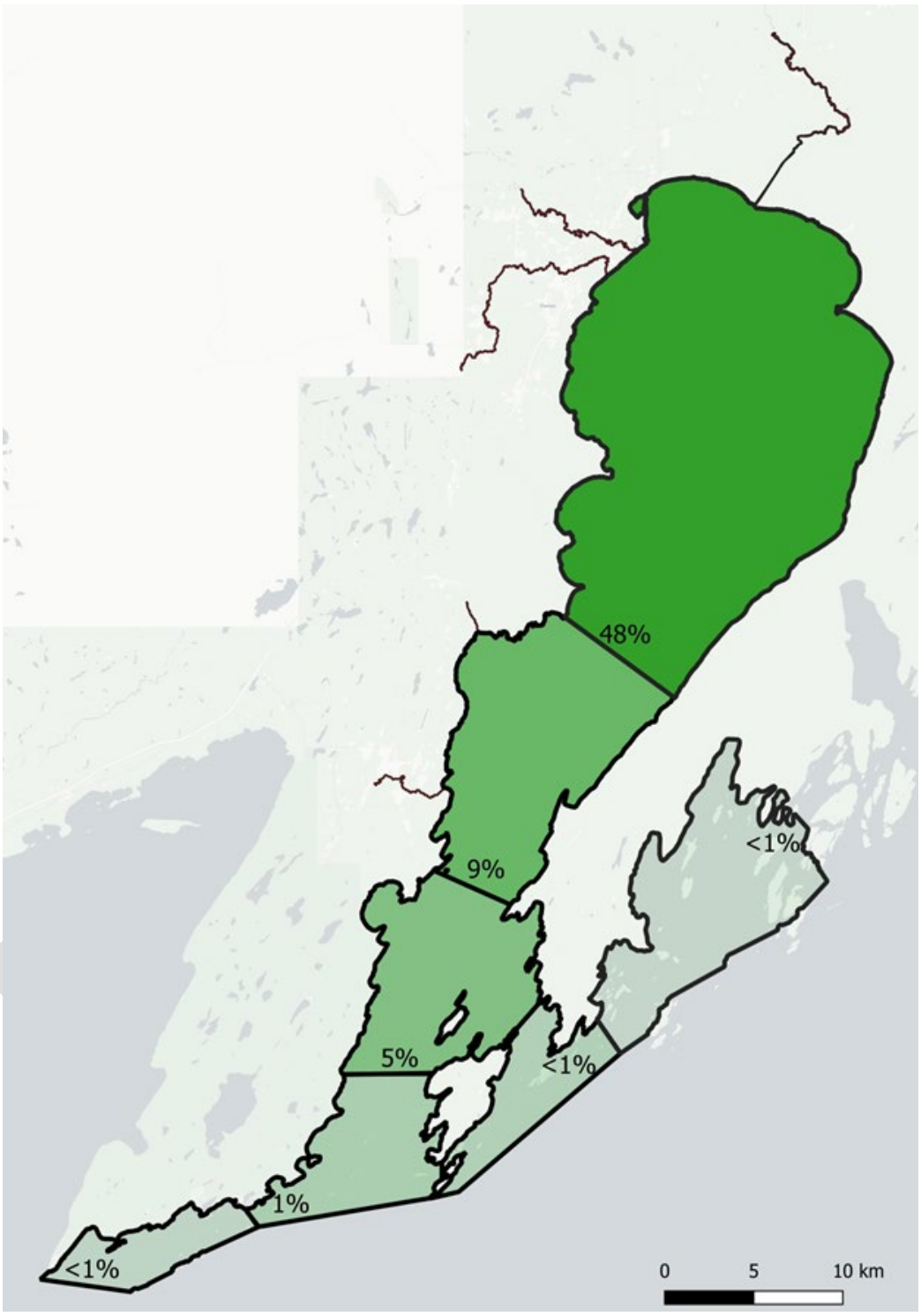

Figure 33. Lake Sturgeon movements within Black Bay.

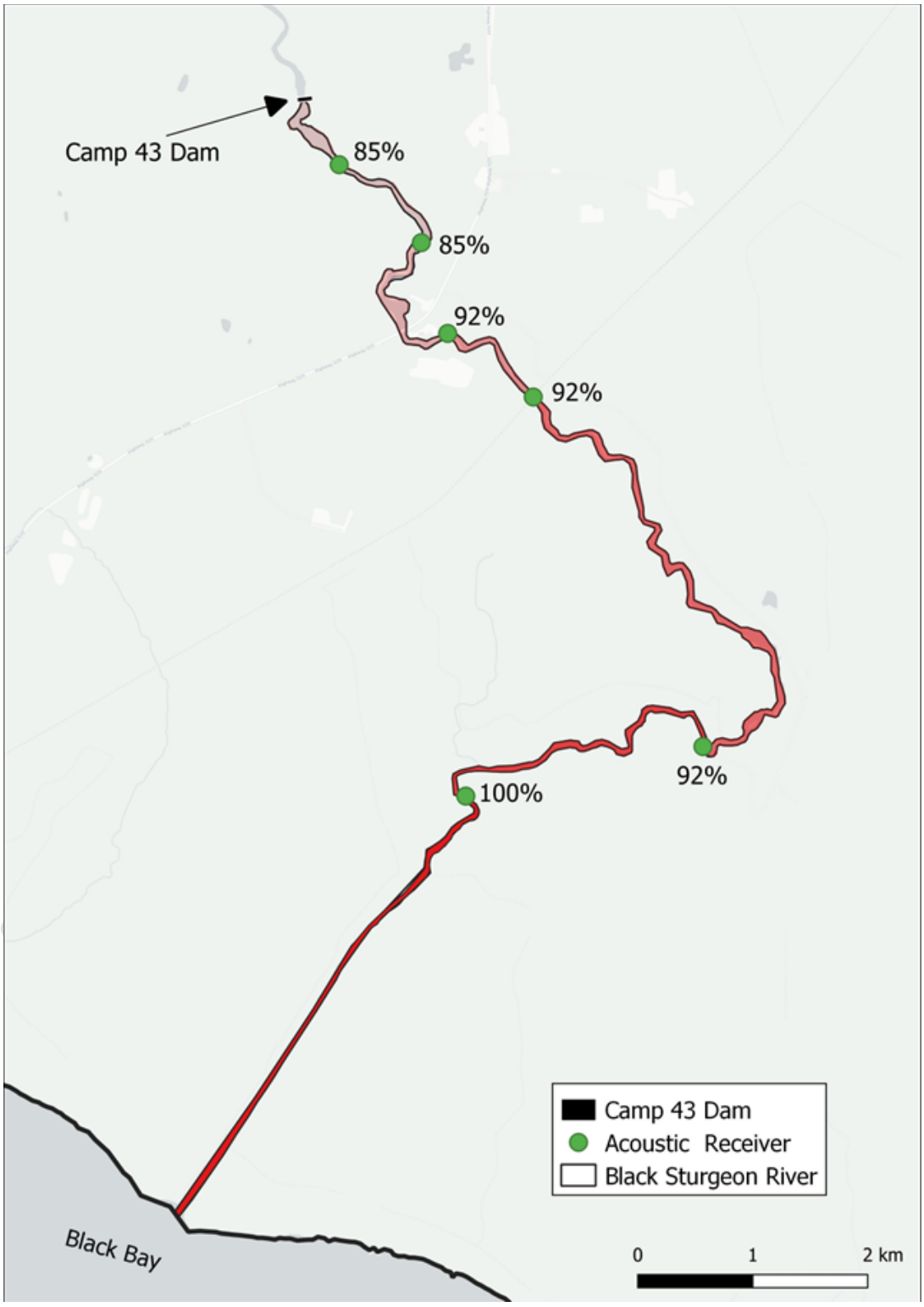

Figure 34. Lake sturgeon migrations within the Black Sturgeon River (May - July).

9.0 Implementation, Monitoring and Plan Review

Implementation

The draft Black Bay Fisheries Management Plan will be posted on the Environmental Registry of Ontario (ERO) as a proposal notice for 30 days. During this time, all relevant comments will be considered. A decision notice will follow, as per ERO process, to clarify how comments received through the proposal notice have been incorporated into the plan. Once a final draft of the plan is completed and approved, all proposed regulatory changes will be submitted for approval and will be reflected in the Ontario Fishing Regulations (OFR). The following table outlines the regulatory changes that will be implemented:

Table 6. Proposed regulatory changes as outcomes from the Black Bay Fisheries Management Planning process.

Species	Current Regulation	Proposed Regulation
Northern Pike	Season: Open all year. Limits: S-4 and C-2; none between 70-90cm, not more than 1 greater than 90cm	Season: Open all year. Limits: S-2 and C-1; S: Not more than one greater than 70cm and none over 90cm. C: none over 70cm.
Chinook Salmon	Season: Open all year. Limits: S-5, C-2.	Season: Open all year. Limits: Reduction to either 2 or 3 fish daily – TBD**.
Walleye	Closed to recreational fishing North of Bent Island (year-round). South of Bent Island – Season: January 1st to April 14th and the third Saturday in May to December 31st. Limit: 2, no size restriction.	Open to recreational fishing. Season: July 1st to December 31st (No ice fishing season). Limits: S-2, C-1, must be between 400mm-508mm (16"-20")

** Denotes that implementation of this regulatory change will be done at a lakewide level through the FMZ 9 Council.

Monitoring

An important aspect of the Black Bay Fisheries Management Plan will be to ensure all goals/objectives/metrics/targets laid out in the Plan are being met. Thus, continued monitoring of the fish community will be vital. The Ministry will continue to use the best available science, technology, protocols, and Indigenous knowledge to monitor Black Bay's fish community. The Ministry will meet with the BBFMP working group annually, and offer to meet with local Indigenous communities, to present and discuss finding from these surveys.

Plan Review

Barring any scenarios in which species-specific objectives and/or targets are not being met, upon implementation, the Plan will be reviewed in 10 years. If through monitoring and assessment, if it is identified that species objectives and targets are not being met, the plan may be revisited on an interim basis. Alternatively, if fish populations remain stable or improve with the regulatory changes, further liberalization of these regulations could be considered in Plan reviews. The Black Bay Fisheries Management Working Group will meet annually to review and discuss results from the Black Bay fisheries monitoring and assessment plan. Opportunities to meet with local Indigenous communities to review and discuss the BBFMP monitoring, and assessment plan will also be offered annually.

10.0 Summary of Consultation

The following is summary of consultation to date:

- Invitation to Indigenous Communities to participate – March 29th, 2022.
- 15 Meetings with the Black Bay Fisheries Management Working Group (April 2023 – September 2024).
- Invitation to Indigenous Communities for an update and input on the Black Bay Fisheries Management Plan – October 23rd, 2024.
- Meeting with Red Rock Indian Band – November 18th, 2024.
- Meeting with Rocky Bay First Nation – November 27th, 2024.
- Meeting with Metis Nation of Ontario (Region 2) – May 15th, 2025.
- Distribution of the draft Black Bay Fisheries Management Plan by the Working Group and Indigenous Communities for review – May 23rd, 2025 (10 day comment period).
- Anticipated - Environmental Registry Posting (30 Day Posting) – XXXX, 2025
- Anticipated - Targeted Email Questionnaire – XXXX, 2025.

List of Acronyms

AIS – Aquatic Invasive Species

BBFMP – Black Bay Fisheries Management Plan

BsM – Broadscale Monitoring Survey

BSR – Black Sturgeon River

COA – Canada Ontario Agreement on the Great Lakes Ecosystem Health

CPUE – Catch per Unit Effort

CSMI – Coordinated Science and Monitoring Initiative

DFO – Department of Fisheries and Oceans

EA – Environmental Assessment

ECCC – Environment and Climate Change Canada

EFFM – Ecological Framework for Fisheries Management

EPA – Environmental Protection Agency

ERO - Environmental Registry of Ontario

ESA – Endangered Species Act

FCIN – Fish Community Index Netting Survey

FCO's – Fish Community Objectives

FMZ – Fisheries Management Zone

FWIN – Fall Walleye Index Netting Survey

GLFC – Great Lakes Fisheries Commission

GLWQA – Great Lakes Water Quality Agreement

HBC – Hudson's Bay Company

LAMP – Lakewide Action and Management Plan

LSTC – Lake Superior Technical Committee

MECP – Ministry of the Environment, Climate Change and Parks

MSY – Maximum Sustainable Yield

NSSA – Northshore Rainbow Trout Association

OFR – Ontario Fishing Regulations

OMNR – Ontario Ministry of Natural Resources

USGS – Unites Stated Geological Survey

QMZ – Quota Management Zone

TBSA – Thunder Bay Salmon Association

UGLMU – Upper Great Lakes Management Unit

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