Ontario

Black Bay Fisheries Management Plan

Ministry of Natural Resources
Fish and Wildlife Services Branch – Upper Great Lakes Management Unit
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Upper Great Lakes Management Unit
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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 Métis peoples. The Ministry of Natural Resources recognizes the fishery in Black Bay continues to be of central importance to local First Nation and Métis communities. Indigenous communities in Ontario have constitutionally protected rights to fish. The MNR recognizes and respects these rights, whether it be for food, social and ceremonial purposes. These rights are fundamentally different than the privileges given to licensed fishers.

The Ministry acknowledges the perspectives of First Nation and Métis 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, and 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 addressing any existing and future legal obligations in respect of First Nation and Métis communities.

Executive Summary

The Black Bay Fisheries Management Plan (BBFMP) was developed by the Ministry of Natural Resources – Upper Great Lakes Management Unit, through collaboration and input from Indigenous communities and local stakeholders. The Plan provides a strategic framework for the long-term sustainable management of Black Bay's fish community.

Historically, Black Bay supported one of the most productive Walleye and Yellow Perch fisheries in Lake Superior. Following significant population collapses in the late 20th century, the Province of Ontario implemented a series of recovery actions including fish stocking, harvest restrictions, and long-term monitoring. The BBFMP builds on these efforts by establishing clear ecological and socioeconomic goals, species-specific objectives, and measurable targets for 13 key fish species.

As a result of the planning process, two key regulatory changes were implemented in the bay with respect to Walleye and Northern Pike. As of January 1, 2026, the following regulations will be in place:

Black Bay to the southern tip of the Black Bay Peninsula (48°24'35"N 88°33'37"W) to Magnet Island, to Porphyry Island, to an unnamed point (48°20'28"N 88°46'09"W) on the southeast side of Sibley Peninsula.

- Northern Pike – open all year
- Northern Pike – S-2, not more than 1 greater than 70 cm, none greater than 90 cm, and C-1; none greater than 90 cm
- Walleye – open July 1 to December 31
- Walleye – S-2 and C-1; must be between 40-50 cm

The Ministry acknowledges that this is a conservative reopening but believes taking a precautionary approach to the re-opening of the Walleye fishery in Black Bay, which has been closed for nearly 30 years, is necessary. A conservative reopening of the Walleye fishery will allow the Ministry to monitor the population and apply an adaptive management approach.

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 state and federal agencies. Since the collapse of the Walleye fishery in Black Bay in the late 1960s, the Province of Ontario has been actively involved in rehabilitation efforts within the bay, which 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 dam 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 province 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, several regulatory changes will be implemented January 1, 2026, and will be reflected in the Ontario Fishing Regulations. In addition to outlining restoration efforts and regulatory changes, the plan incorporates a long-term assessment and monitoring framework. Fisheries-independent survey data will continue to be analyzed to assess continued 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 38 km northeast 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 was previously 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 fishery 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 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 1960s (Wilson, 1991). By the late 1950s, 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 1830s; 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 Shesheeb 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 1960s, 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 collapse of the Walleye population, commercial fishers shifted their efforts towards Yellow Perch in the early 1970s. 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 to 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 from Quota Management Area S03 (Black Bay) (Table 1) (OMNR-UGLMU, 2024). However, targeted commercial fishing effort for Walleye and Yellow Perch is not permitted.

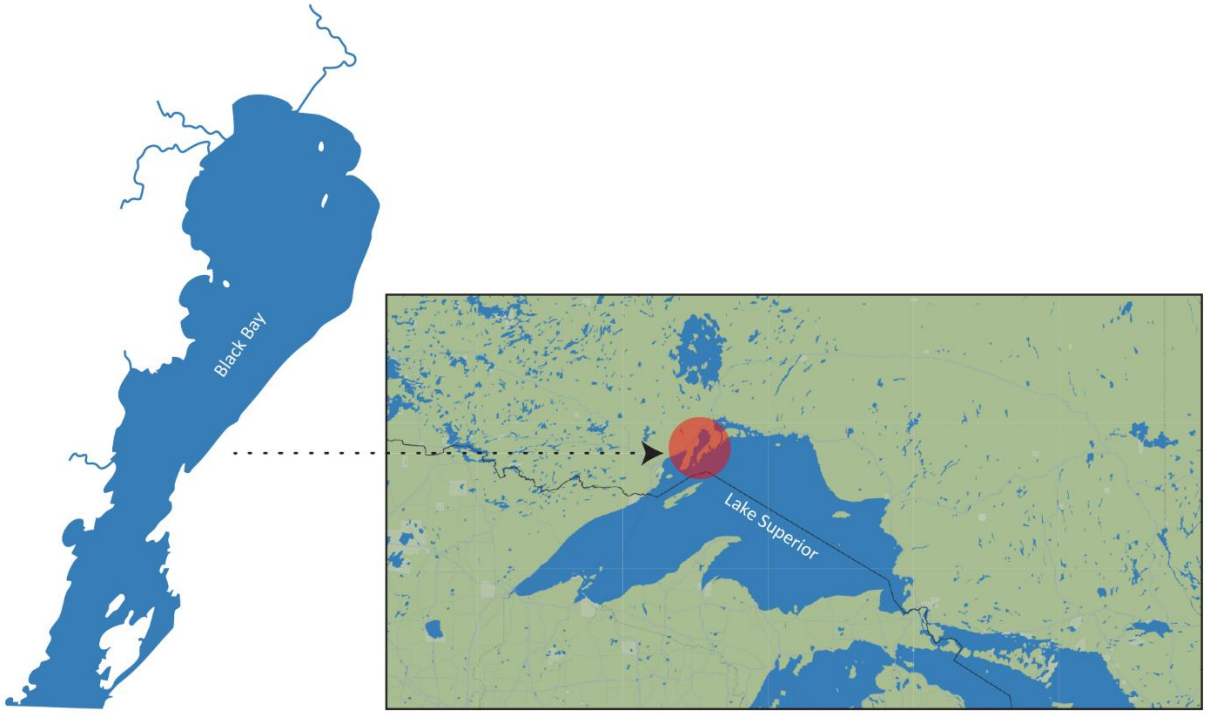

Figure 1. Map of Black Bay with a reference to its location within Lake Superior.

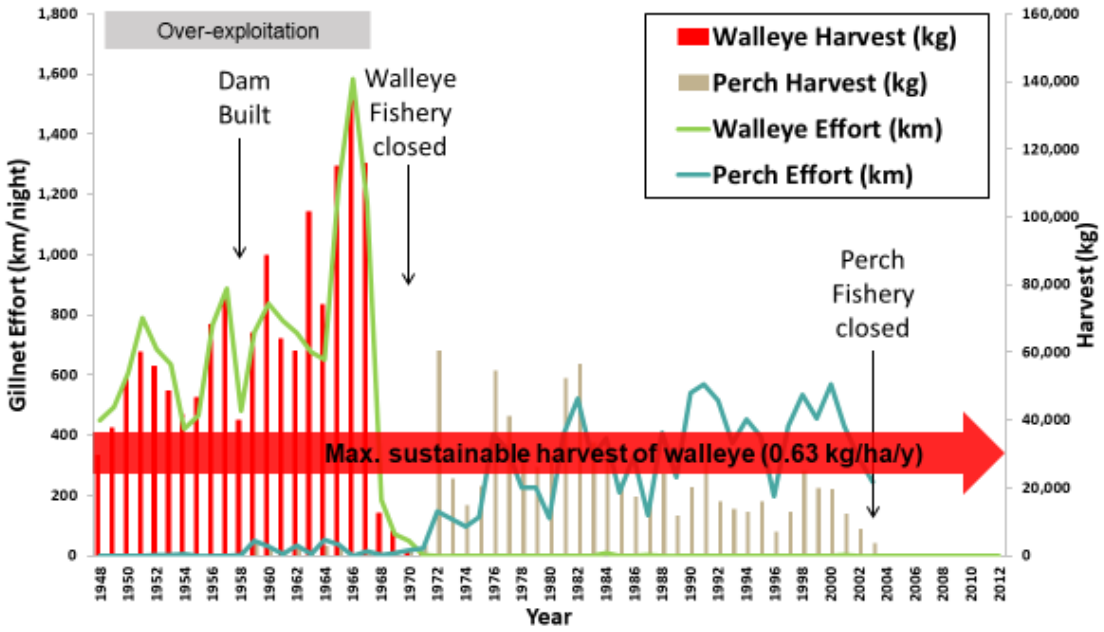

Figure 2. Annual commercial harvest and effort for Black Bay Walleye and Yellow Perch.

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 1970s, 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 1960s 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 1970s:

- 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 and Assessment

The MNR is responsible for assessing and managing fisheries in Lake Superior. The Ministry's assessment program collects information on various fish species to determine stock status and monitor progress toward rehabilitation. Since the early 2000s, monitoring and assessment of Black Bay's fish community has been a provincial priority. These surveys have enabled the province to track the status of various species and to monitor the recovery of Walleye and Yellow Perch within the bay. The following fisheries-independent surveys have been used by the Ministry to assess the fish community, estimate relative abundance, determine the population and age structure, and 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 percid species in both lakes and rivers. FWIN uses multi-mesh (25 mm – 152 mm) gillnets set overnight in the fall at 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 (FMZs). 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 gillnets (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 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 Fishery Commission (GLFC) – Joint Strategic Plan for Management of Great Lakes Fisheries

The Great Lakes Fishery Commission (GLFC) 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 of other 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 (FCOs) for Lake Superior

One of the key commitments made in the JSP is the development of Fish Community Objectives (FCOs) for each lake. Lake Superior's FCOs 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 FCOs.

To view Lake Superior's FCOs 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 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, with Annex 7 focusing on habitat and species' health including the rehabilitation of Lake Superior's native fish community. Through the implementation of the Canada-Ontario Agreement (COA) on Great Lakes Water Quality and Ecosystem Health (COA, 2021), Ontario and Canada work together to ensure Canada fulfills 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

Ontario's Provincial Fish Strategy (2015) 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 an adaptive management approach – a 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 that are expected to be considered in management planning and decision-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, Ontario, measured as the absolute spawner abundance.
- 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, in order 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 the 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 Métis 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 includes representatives from the following communities and organizations:

- Red Rock Indian Band
- Fort William First Nation
- Métis Nation of Ontario
- Red Sky Métis Independent Nation
- Thunder Bay Salmon Association
- North Shore Steelhead Association
- Northwestern Ontario Sportsmen's Alliance
- Ontario Commercial Fisheries' 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

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 lakewide 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 (i.e., Walleye, Lake Sturgeon, Lake Trout, Brook Trout and Cisco).

4. **BIODIVERSITY**: Fisheries management will ensure the conservation of biodiversity by committing to healthy ecosystems, protecting 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 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, strategy development and implementation. Information from the bi-national lakewide 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 that would be covered by the Plan, as well as the fish species to be included. At the same time MNR staff notified the group of items and subjects that would remain out of scope throughout the planning process to ensure discussions stayed focused.

6.1 In Scope

Species in Scope:

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

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 Area 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 Porphyry Island, including tributaries.

Ultimately, the group recommended using Option C to define the geographic range of the Plan as it best encompassed 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., reptiles, 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

To 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 Walleye

Walleye Background Information

Walleye are a widespread cool water species that are highly valued in Indigenous, recreational, and commercial fisheries across Ontario. As previously discussed, prior to its 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 1970s 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 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 4). 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 adult 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 5).

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 6). Natural annual mortality in a healthy population is typically around 15.6% (Lester et al., 2014) which has been approached in Black Bay recently.

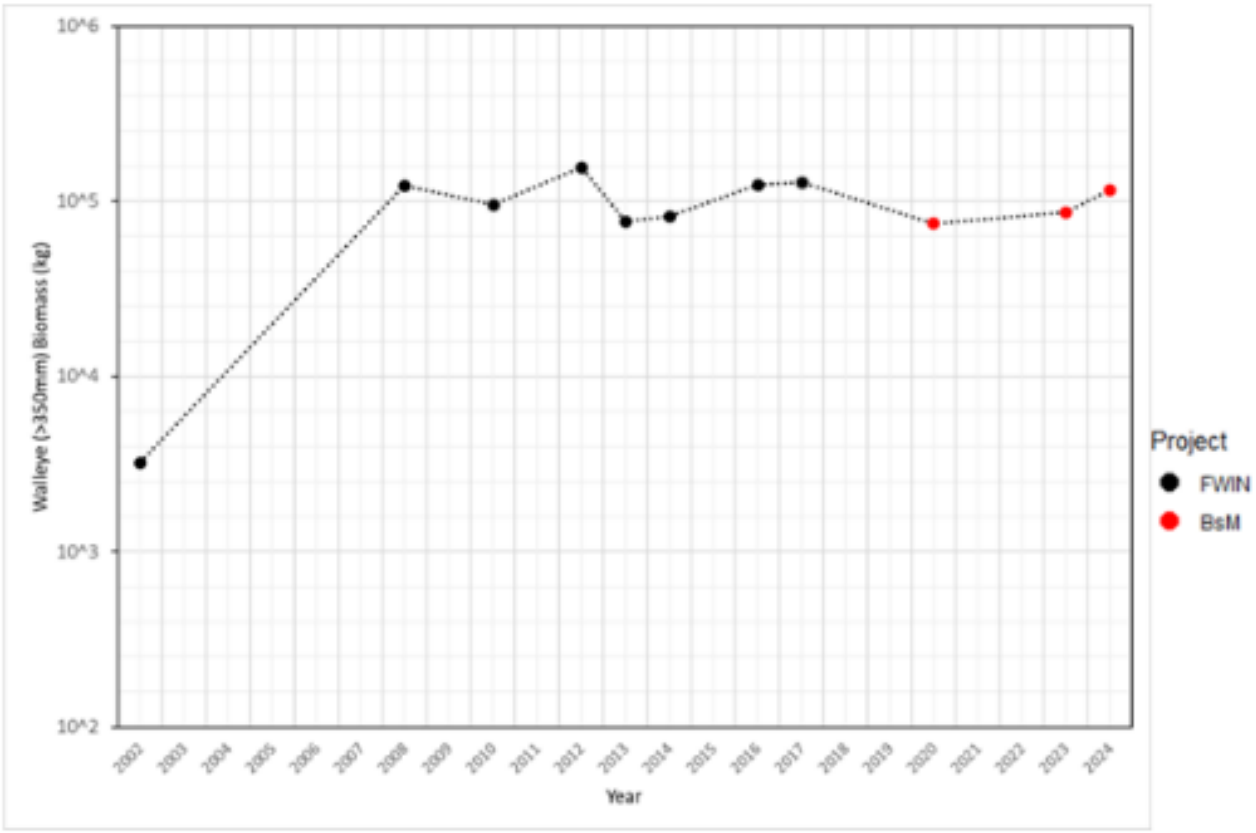

Figure 4. Adult Walleye (>350mm) biomass from FWIN (2002-2017) and BsM (2020-2024) surveys, estimated from CPUE and gillnet catchability coefficients from Giacomini et al. (2020).

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 year classes present in the 2023 BsM survey (age 0 to age 19) (Figure 7). 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 and increased to 4.6 years in 2017. The mean age of Walleye captured increased to 7.2 and 7.3 years in 2020 and 2023, respectively.

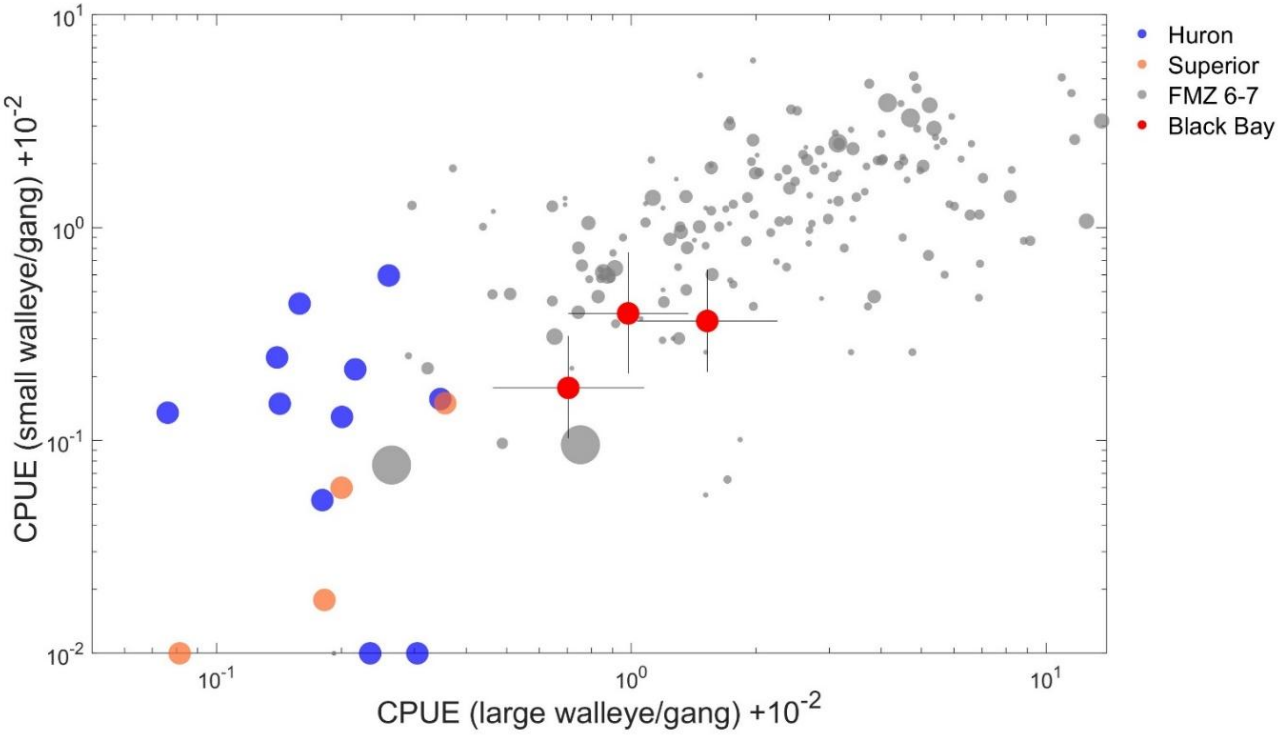

Figure 5. Small (<350 mm) and large (>350 mm) Walleye CPUE from Black Bay BsM surveys relative to other Great Lakes and NW region inland Walleye fisheries. The unit of effort (gang) refers to a gillnet gang of the large mesh (North American) standard used in BsM surveys.

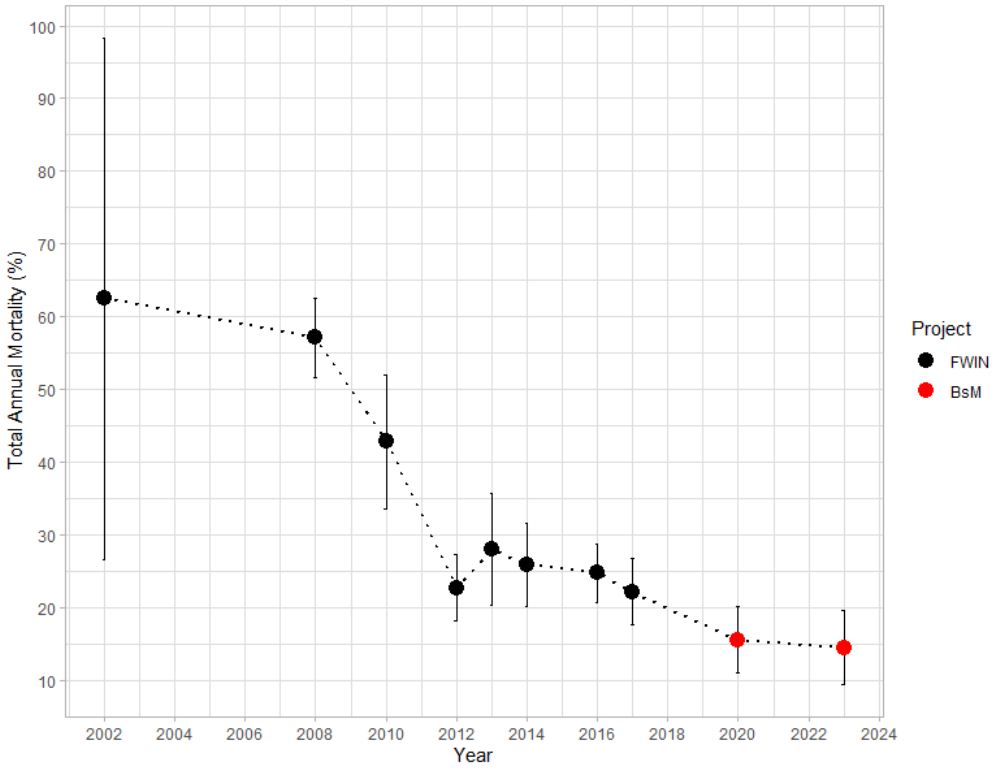

Figure 6. Estimates of total annual mortality of Walleye from FWIN (2002-2027) and BsM (2020-2023) surveys.

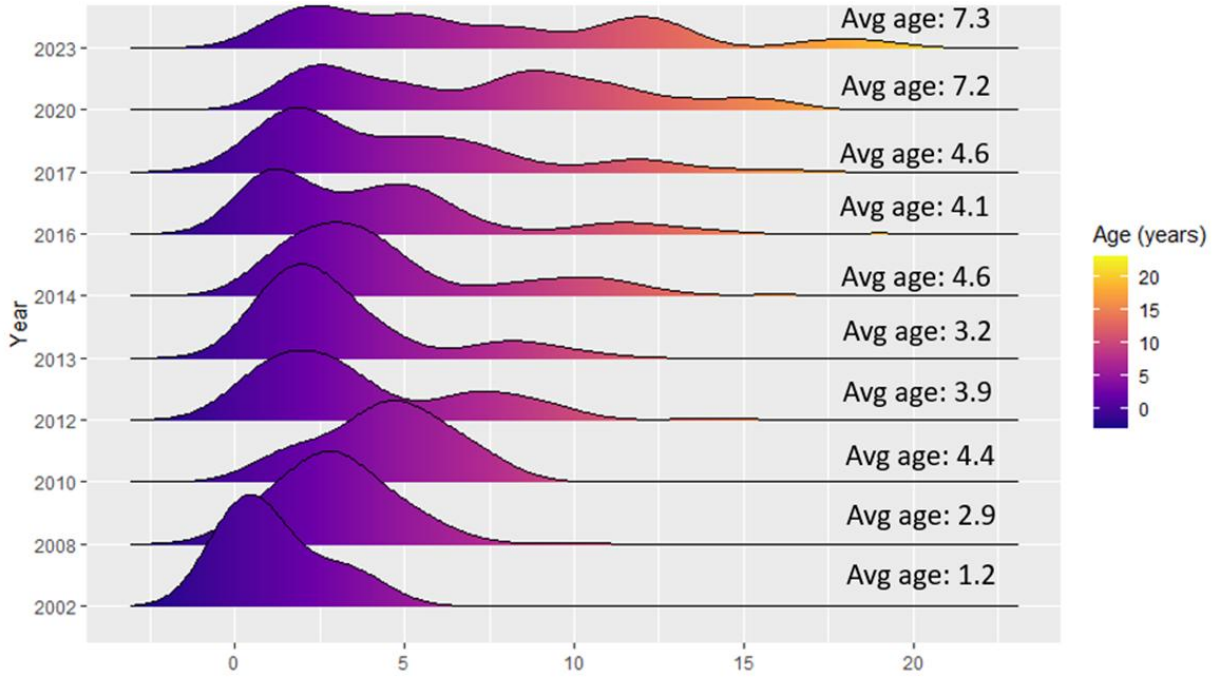

Figure 7. Black Bay Walleye age distribution with mean ages from FWIN (2002-2017) and BsM (2020-2023) surveys.

Black Bay Walleye Acoustic Telemetry Study

Acoustic telemetry is a relatively new tool used by fisheries management agencies to monitor the movements and behaviour 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) study was initiated in 2016 by 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 (if any) would benefit 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 8).

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, suggesting that in-lake or shoal spawning may be 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 9, Table 2). 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 10).

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 current 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 11). 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.

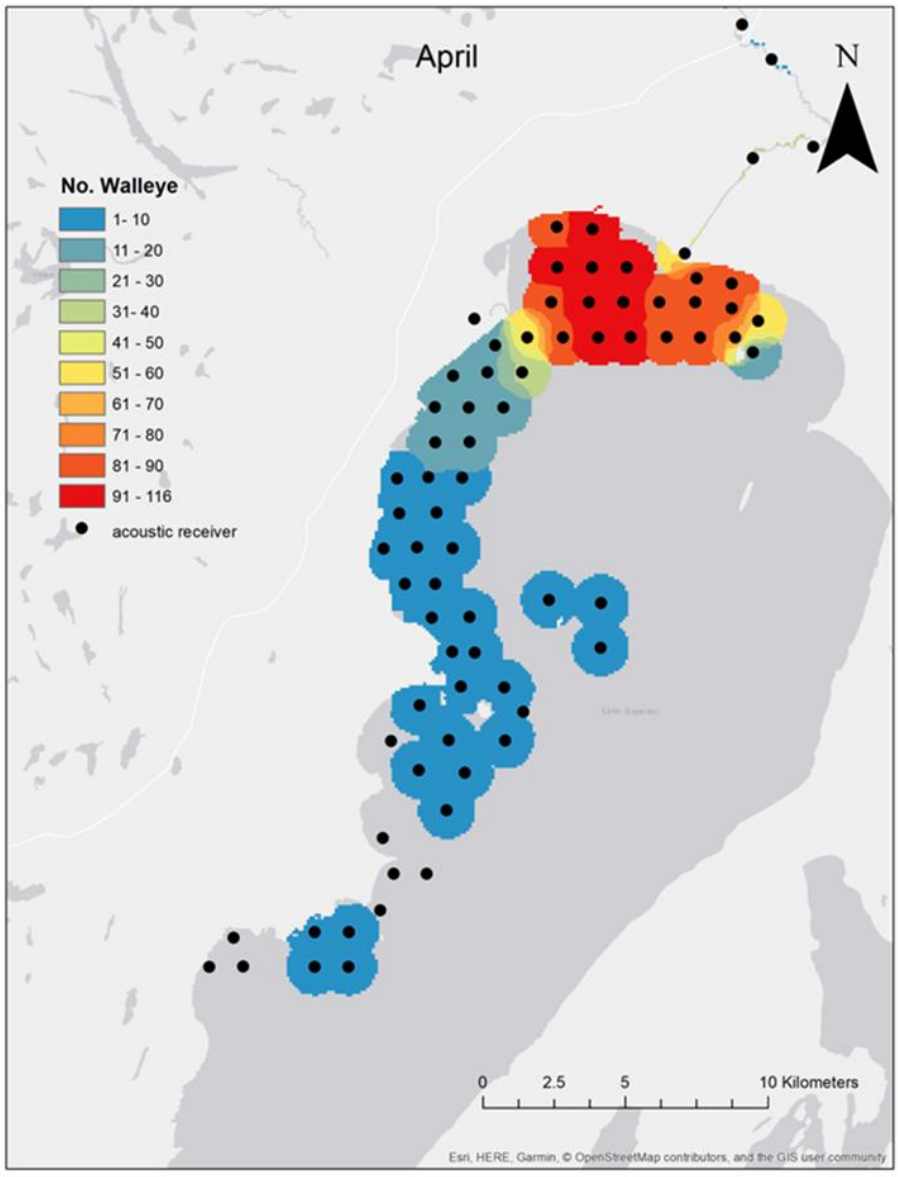

Figure 8. Walleye detections by receiver in the north end of Black Bay during the pre-spawn season (March/April).

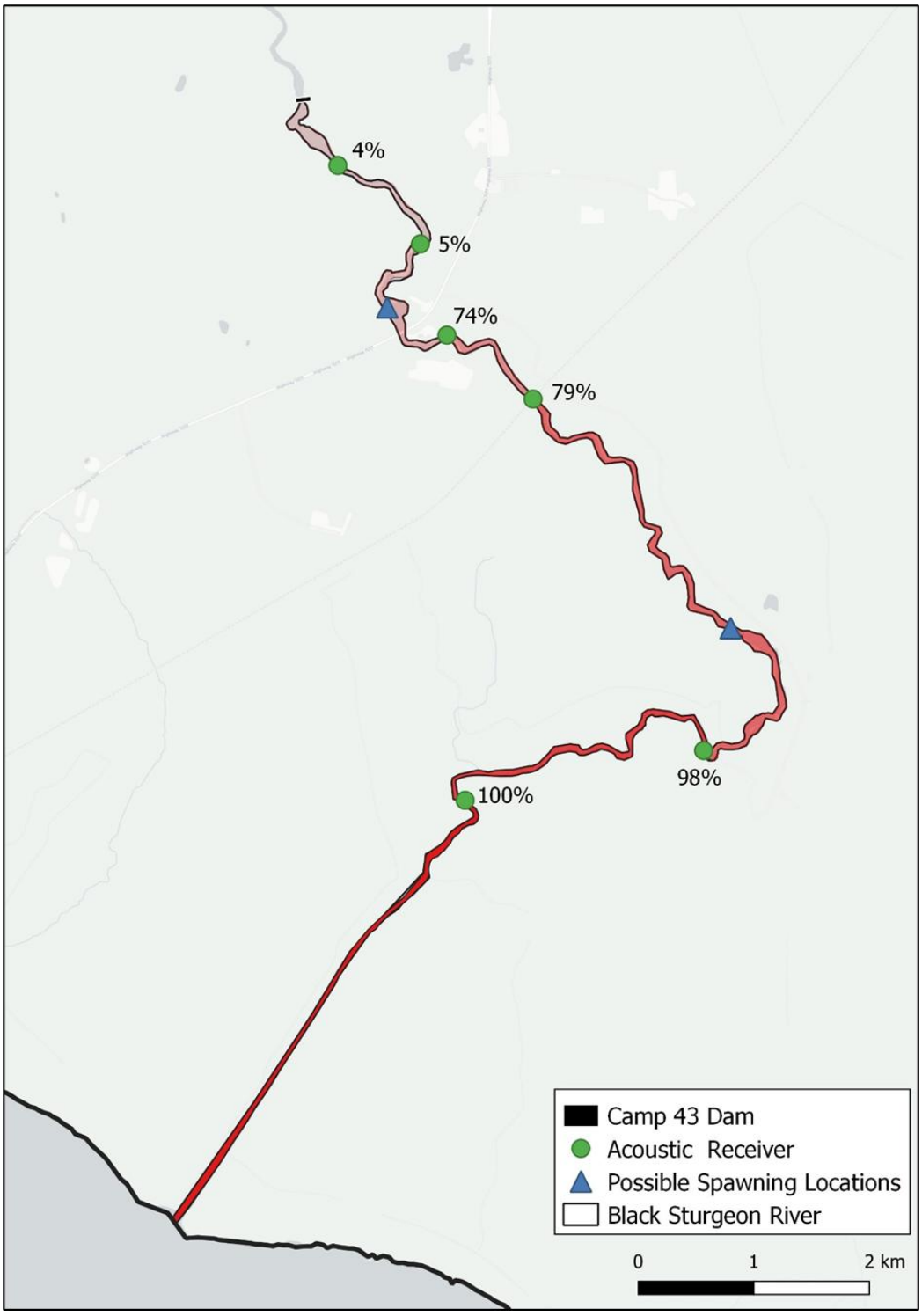

Figure 9. Map showing receiver locations and the relative proportion of tagged Walleye that are assumed to have spawned in the Black Sturgeon River from 2016-2021.

Table 2. 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

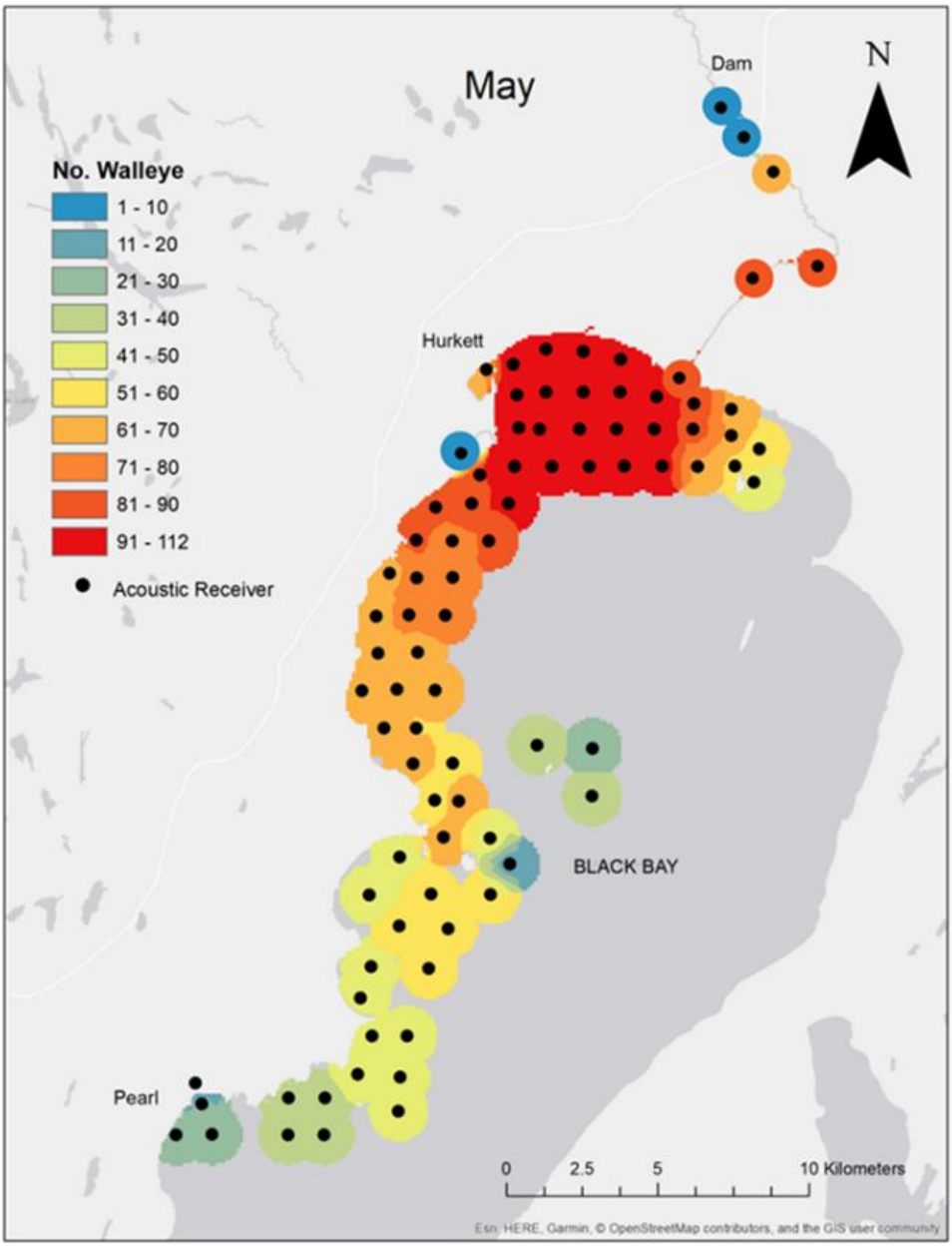

Figure 10. Walleye detections by receiver during the post-spawn period.

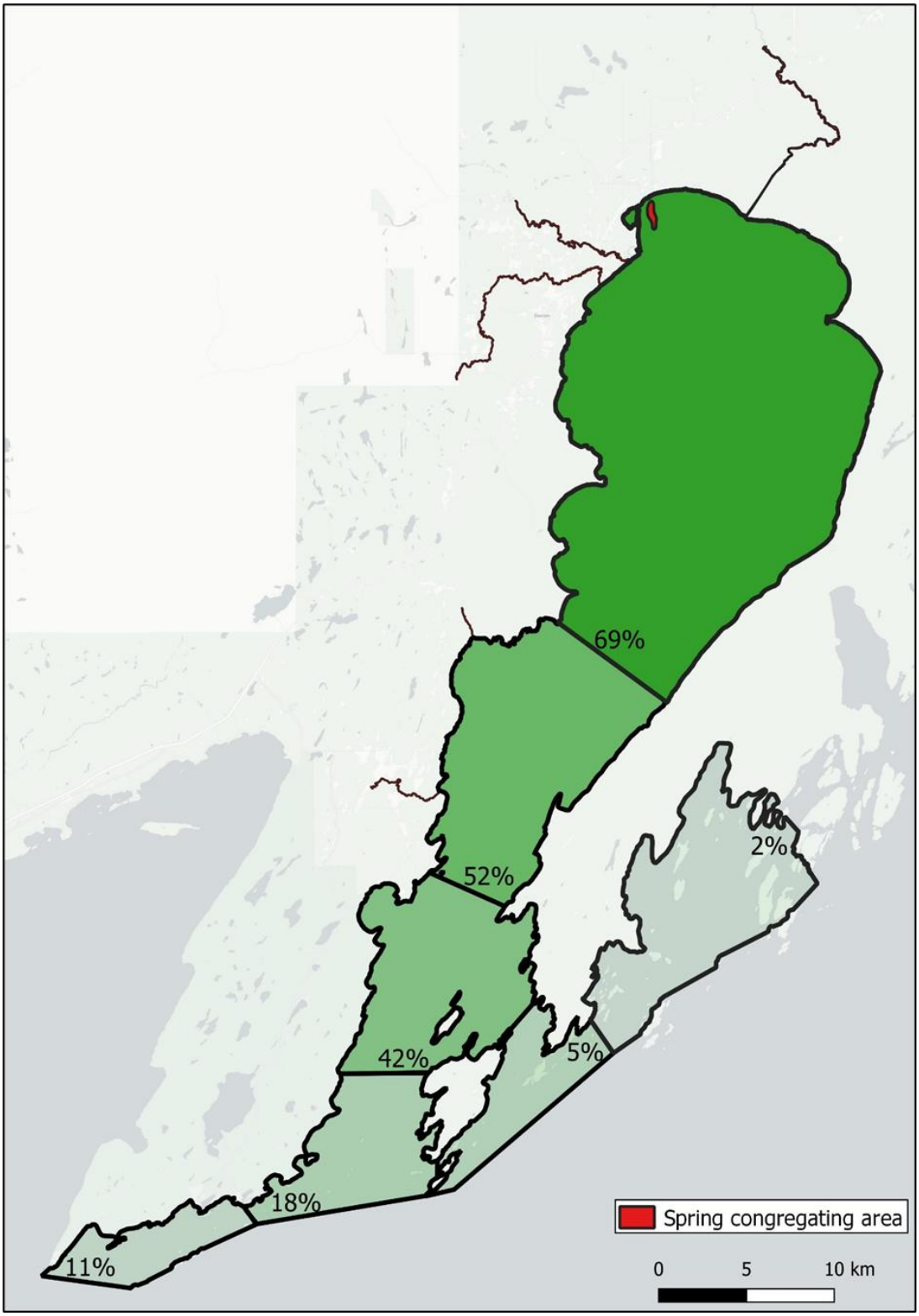

Figure 11. Map showing the relative proportion of all tagged Walleye detected at acoustic receiver gates inside, and adjacent to, Black Bay, Lake Superior from 2016-2021; and an early spring congregating area (red) for Walleye that was determined using VEMCO Positioning System (VPS) analysis, during 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-sustaining, and shows a healthy age and size structure.
- Consistent seasonal migrations within and out of Black Bay.
- The northwest corner of Black Bay is a critical area for Walleye during pre-spawn, spawning and post-spawn periods.
- Most Walleye that enter the Black Sturgeon River don't go beyond the rapids upstream from HWY 11/17 and 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 remain regarding the state and pace of Walleye recovery. Some Working Group and First Nation members believe that recovery has not yet fully occurred, 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 continued increases in Walleye abundance may negatively impact other species in the fish community (e.g., Rainbow Trout 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 (>350mm) biomass is greater than 87,000 kg.
2. Minimum of 14 year classes present in the population.
3. Mean age of Walleye caught in fisheries-independent assessment surveys is greater than 7 years.
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 should be below 29%, as determined by BsM gillnetting surveys.
2. Increase non-targeted Walleye quota to 1500 kg annually up from 652 kg 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 1 to December 31 for the entire bay.
    - Walleye two (2) fish daily catch and possession limit.
    - Walleye harvestable slot size of 40-50 cm.
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 87,000 kg 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.

8.2 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 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 and other species. Of the total estimated 1117 rod hours of effort 881 (79%) of those were from anglers targeting Northern Pike. An estimated 621 Northern Pike were caught with a CPUE of 0.705 fish/hour. Of the 621 fish caught it is believed that approximately 88 (14%) were harvested.

Northern Pike Background Information Summary

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

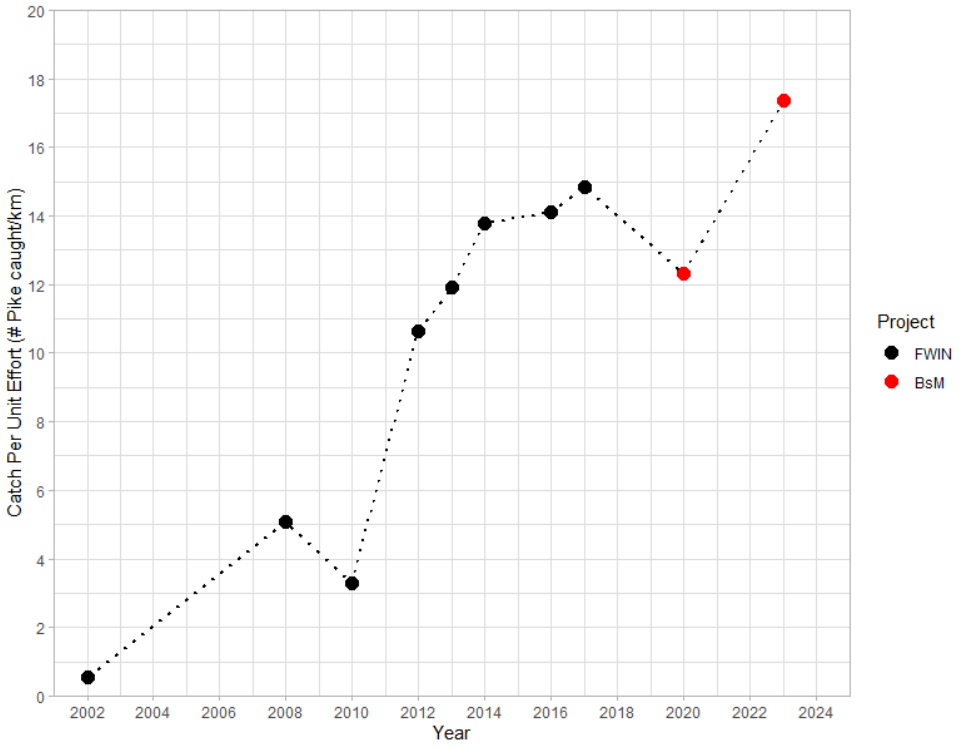

Figure 12. Northern Pike CPUE from FWIN (2002-2017) and BsM (2020-2023) surveys.

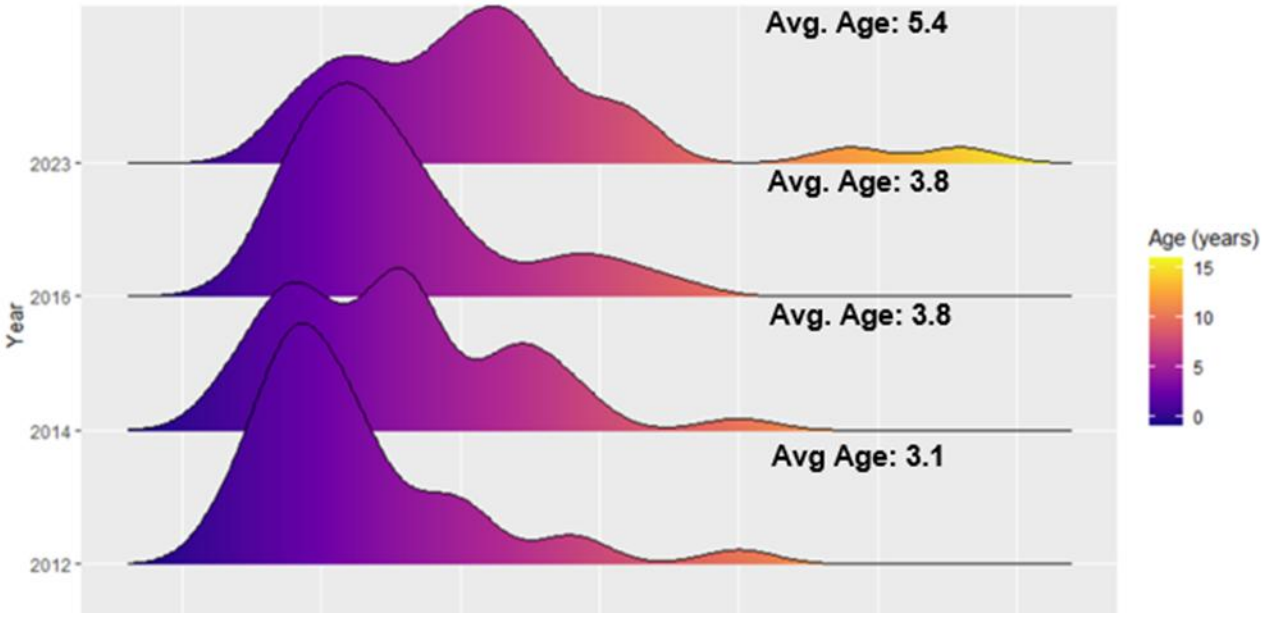

Figure 13. Northern Pike age distributions from FWIN (2002-2017) and BsM surveys (2020-2023).

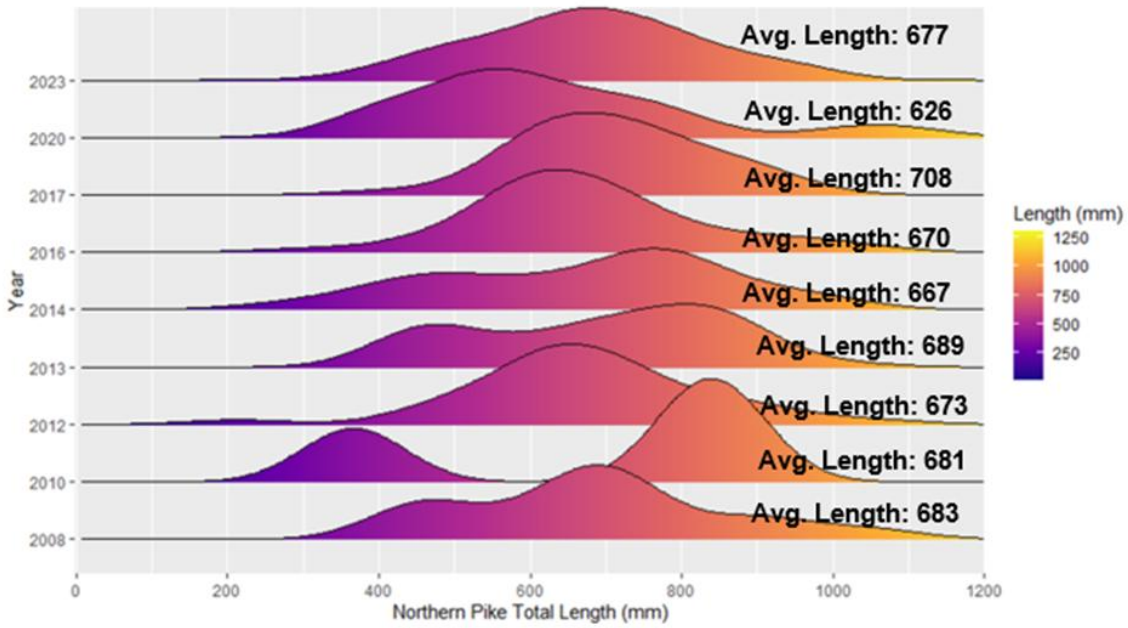

Figure 14. Northern Pike total length distributions from FWIN (2008-2017) and BsM surveys (2020-2023).

Northern Pike Issues Identification

1. Angler dissatisfaction with the inability 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 continues to increase.

Northern Pike Ecological Objective

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

Northern Pike Ecological Targets

1. Maintain Northern Pike relative abundance (CPUE) above 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 surveys) which ensures the presence of large fish in the population.

Northern Pike Socioeconomic Objectives

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 101.6 cm).
2. Increase in angler satisfaction.

Northern Pike Socioeconomic Target

1. Maintain angler perception and 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.

8.3 Yellow Perch

Yellow Perch Background Information

Yellow Perch are a common temperate fish that are found in both warm and cool water 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 15):

1) ***Pre-1972*** when catches were relatively minor, and when most harvest was taken as by-catch in the commercial fishery (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) ***1984-2003*** 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 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 16). The relative biomass (kg/km of gillnet) of Yellow Perch 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, relative 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 17).

Yellow Perch sampled between 2002 and 2020 have ranged in age from 0 to 15 years (Figure 18). 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.

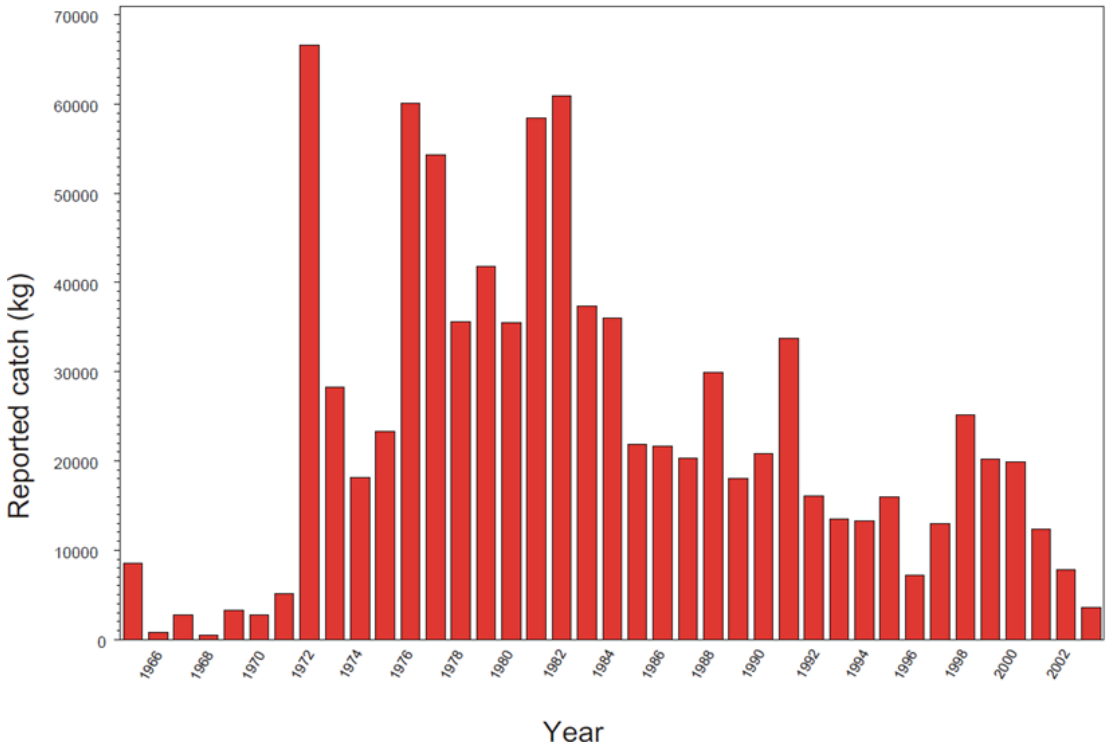

Figure 15. Reported annual commercial catch of Yellow Perch from Black Bay (spring fishery closed in 1985).

The mean total length of Yellow Perch captured in FWIN and BsM surveys in Black Bay, has increased since 2002 (mean length of 155 mm), but has declined slightly since 2017 (Figure 19). The slight decrease is likely due to what appears to be strong year class of younger and smaller fish.

Total annual mortality of Yellow Perch in Black Bay has declined sharply since 2002, from 44.7% to 18% in 2020 (Figure 20). This decline is likely attributed to the closure of the commercial fishery in 2004.

In summary, data from FWIN and BsM surveys suggest that the Yellow Perch population is healthy and characterized by significant increases in abundance since the early 2000s, the presence of numerous age classes, an increase in the average age and size, and low total annual mortality.

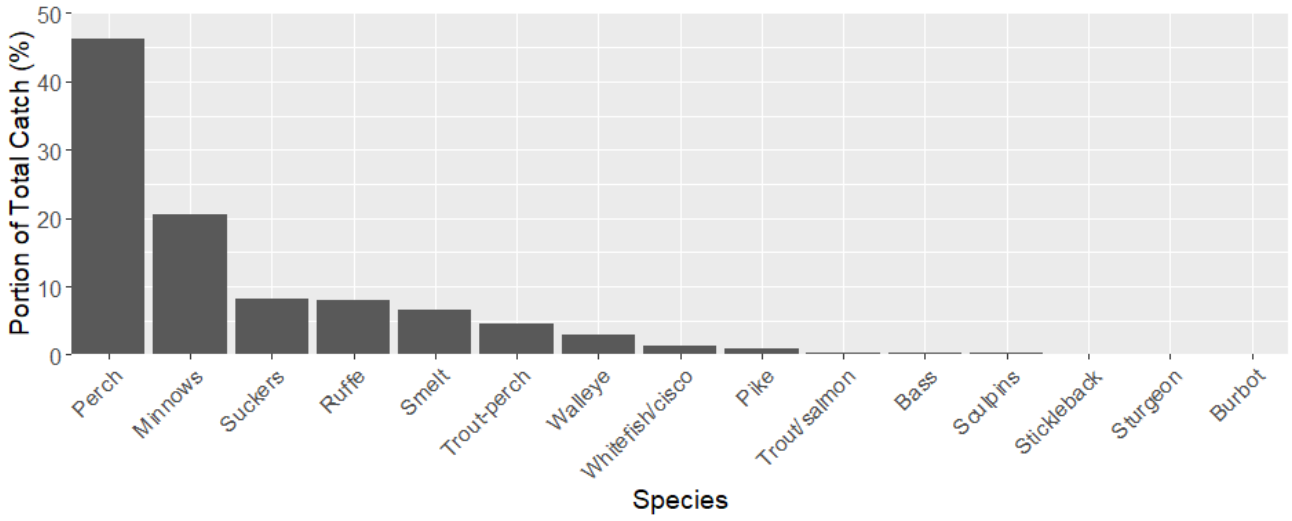

Figure 16. Proportion of total catch by species from the 2023 Black Bay BsM survey.

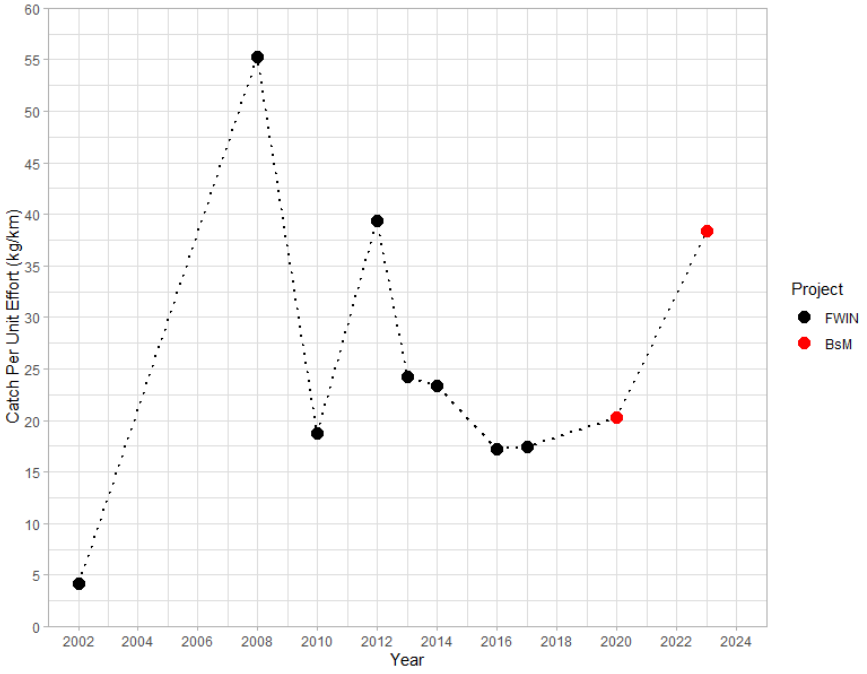

Figure 17. Catch per unit effort (kg/km) of Yellow Perch caught in FWIN surveys (2002-2017) and BsM surveys (2020-2023).

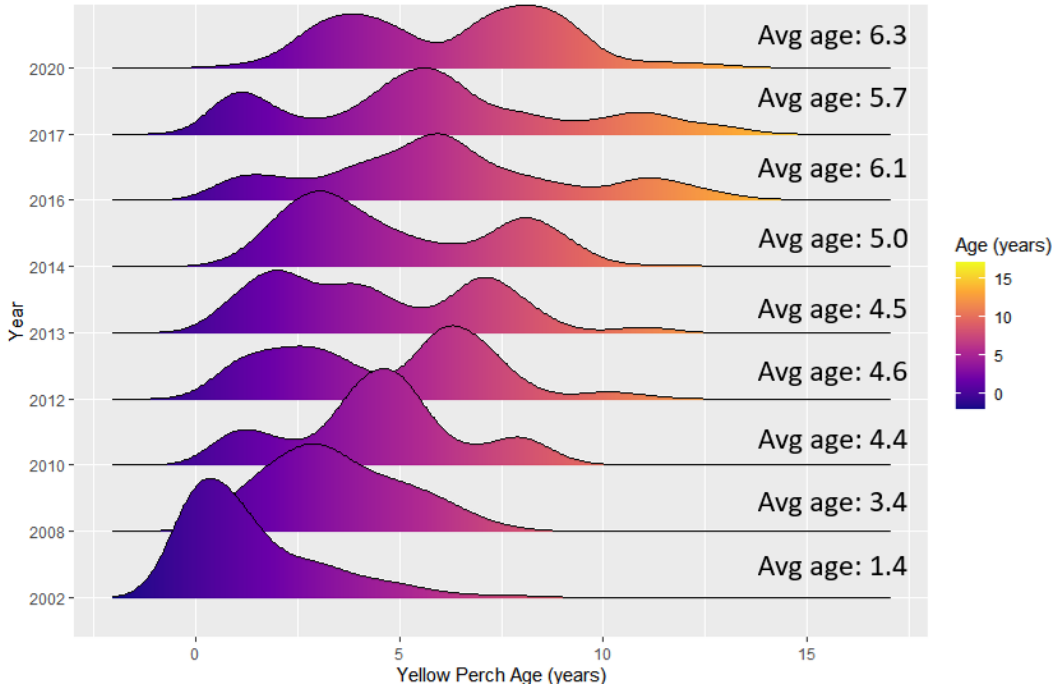

Figure 18. Yellow Perch age distributions from FWIN (2002 – 2017) and BsM surveys (2020).

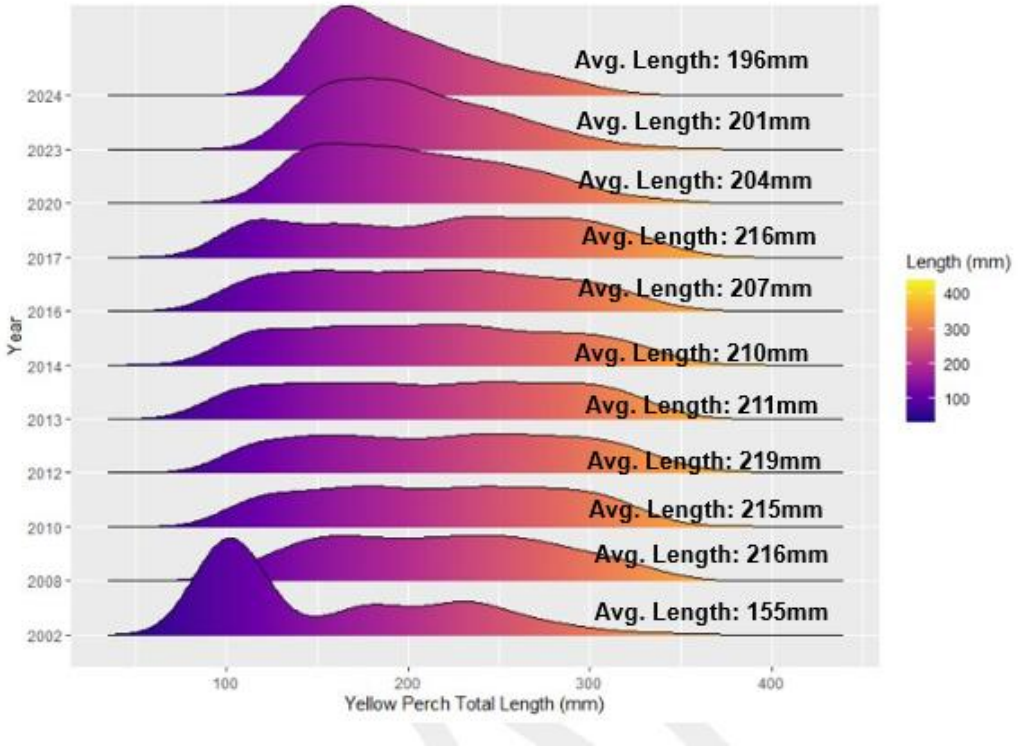

Figure 19. Yellow Perch total length distribution from FWIN (2002-2017) and BsM surveys (2020 – 2024).

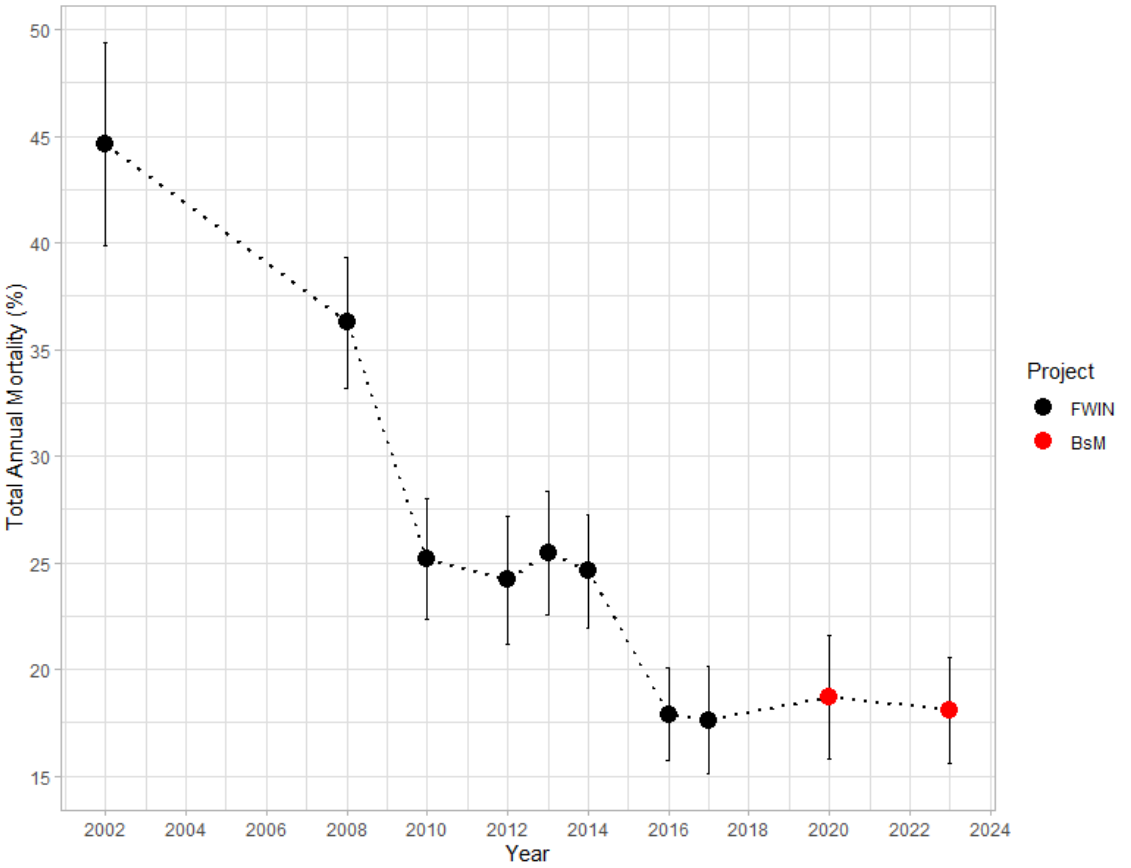

Figure 20. Yellow Perch total annual mortality estimates from FWIN surveys (2002-2017) and BsM surveys (2020-2023).

Black Bay Winter Creel Surveys

The Ministry conducted winter creel surveys on Black Bay in the winters of 2014 (January 10 to March 31) and 2022 (February 17 to March 13). The purpose of these surveys was to collect information on angler effort and harvest during the winter fishery, which typically targets Yellow Perch. It should be noted that the winter of 2022 was severe with prolonged cold temperatures that impacted sampling and, likely, angler 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. Angler effort (40,776 rod hours), estimated Yellow Perch catch (46,174 individuals) and harvest (24,918 individuals) were significantly higher in 2014 compared to 2022. This is due in part to the length of the survey (three months vs. one month) and more conducive environmental conditions for recreational fishing in 2014; 2022 was, comparatively, a much harsher winter than 2014. Estimated CPUE (#fish/line/hr) in 2014 (1.132) was nearly twice the estimated CPUE of 0.603 in 2022. While the decline in CPUE could indicate reduced Yellow Perch

abundance, it may also reflect natural population fluctuations driven by environmental conditions or density-dependent factors. Despite this, the Yellow Perch population in Black Bay appears healthy.

Table 3. 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 BsM surveys.

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 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 200 mm from BsM surveys.

Yellow Perch Actions and Strategy

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

8.4 Smallmouth Bass

Smallmouth Bass Background Information

Smallmouth Bass are a warmwater species that are typically limited to warmer embayments in Lake Superior. In Black Bay, Smallmouth Bass are commonly found in the north end of the bay. Both FWIN and BsM surveys catch Smallmouth Bass in low numbers as larger individuals are not very susceptible to gillnets. Since 2002 there has been a minor increase in CPUE from 1 fish/km to 2.8 fish/km over the past six gillnetting 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 Information 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.

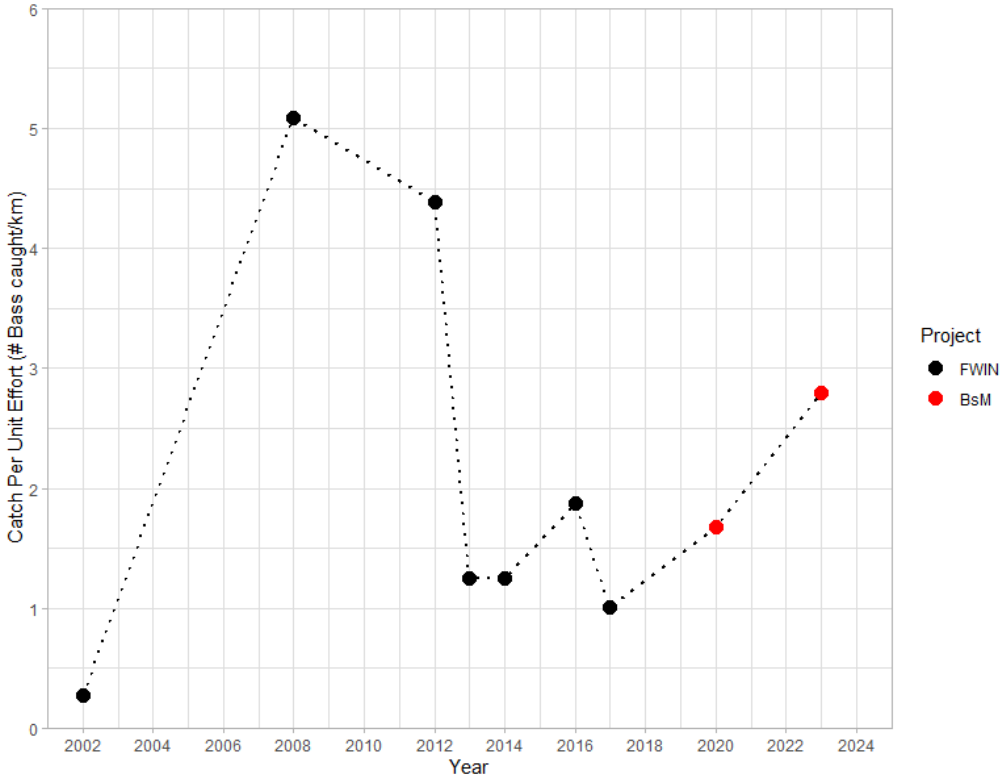

Figure 21. Smallmouth Bass CPUE from FWIN (2002-2017) and BsM (2020-2023) surveys in Black Bay.

Smallmouth Bass Issues Identification

1. Limited 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 Objectives

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, a part of future Lake Superior Coordinated Science and Monitoring (CSMI) work.

Smallmouth Bass Ecological Targets

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 fisheries-independent assessment surveys in Black Bay as part of Lake Superior's CSMI work in 2026 that will collect information on the Black Bay Smallmouth Bass population.

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 valued 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 22-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 22-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.

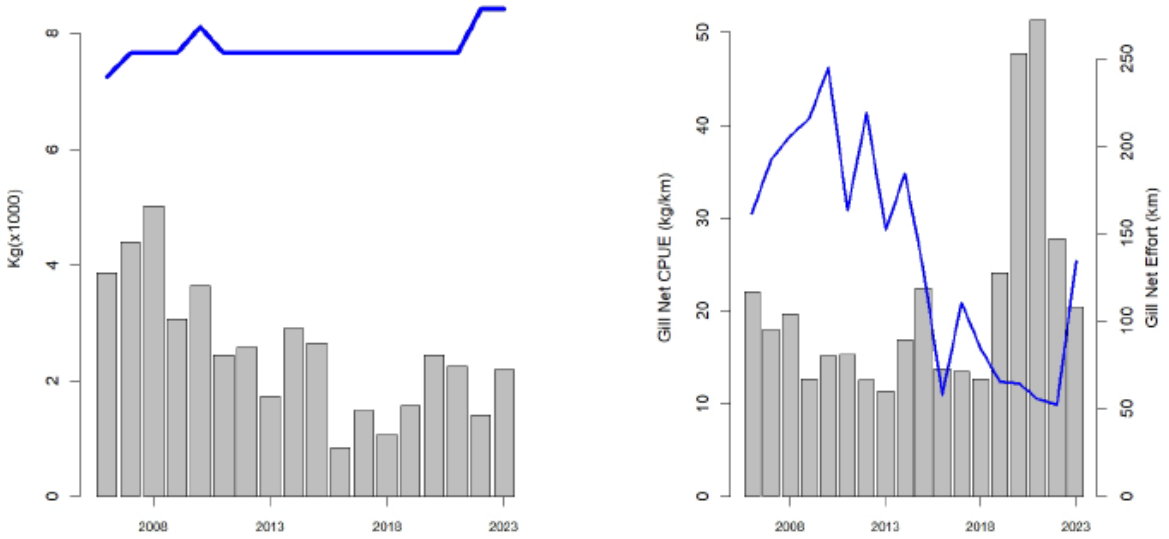

Figure 22. (Left) Commercial Lake Trout harvest on grey bars with quota represented by the blue line. (Right) Lake Trout CPUE (kg/km) in grey bars with effort represented by the blue line.

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 Target

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 Target

1. 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 Brook Trout

Brook Trout Background Information

Brook Trout is a coldwater species that is highly valued amongst sport anglers in the region. Brook Trout populations in Lake Superior are often referred to as Coaster Brook Trout or "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 both coaster and stream resident Brook Trout. Despite their popularity, very little data specific to Brook Trout in Black Bay have been collected.

Brook Trout Background Information Summary

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

Brook Trout Issues Identification

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

Brook Trout Ecological Objectives

1. Maintain the current state of the fishery.
2. Learn more 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.

8.7 Chinook Salmon

Chinook Salmon Background Information

Chinook Salmon, a popular sportfish native to the Pacific Ocean, were first introduced into Lake Superior in the late 1800's. Following initial introductions, US state fisheries management agencies stocked Chinook Salmon annually into Lake Superior between the 1970s and early 2000s. Since then, stocking has decreased significantly to the point where the only Chinook Salmon stocking in Lake Superior is conducted by a private club in Thunder Bay, Ontario. This reduction reflects the fact that populations across the lake are now largely self-sustaining through natural reproduction (Figure 23).

The south end of Black Bay hosts a popular open water recreational fishery that targets Chinook Salmon. During the summers of 2013 and 2014 the Ministry conducted an access creel survey at four popular boat launches in Black Bay to collect harvest and effort data on the Black Bay recreational fishery. Estimated CPUE (fish/hour) varied from 0.301 in 2013 to 0.187 in 2014 with nearly all fish that were caught being harvested (Tables 4 and 5). No additional Chinook Salmon surveys have been conducted in Black Bay, so information remains limited. However, anecdotal reports from anglers describe Chinook Salmon fishing in Black Bay as very poor in recent years.

Chinook Salmon Background Information Summary

- The Thunder Bay Salmon Association (TBSA) stocks Chinook Salmon annually in the Kaministiquia River in Thunder Bay.
- 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.

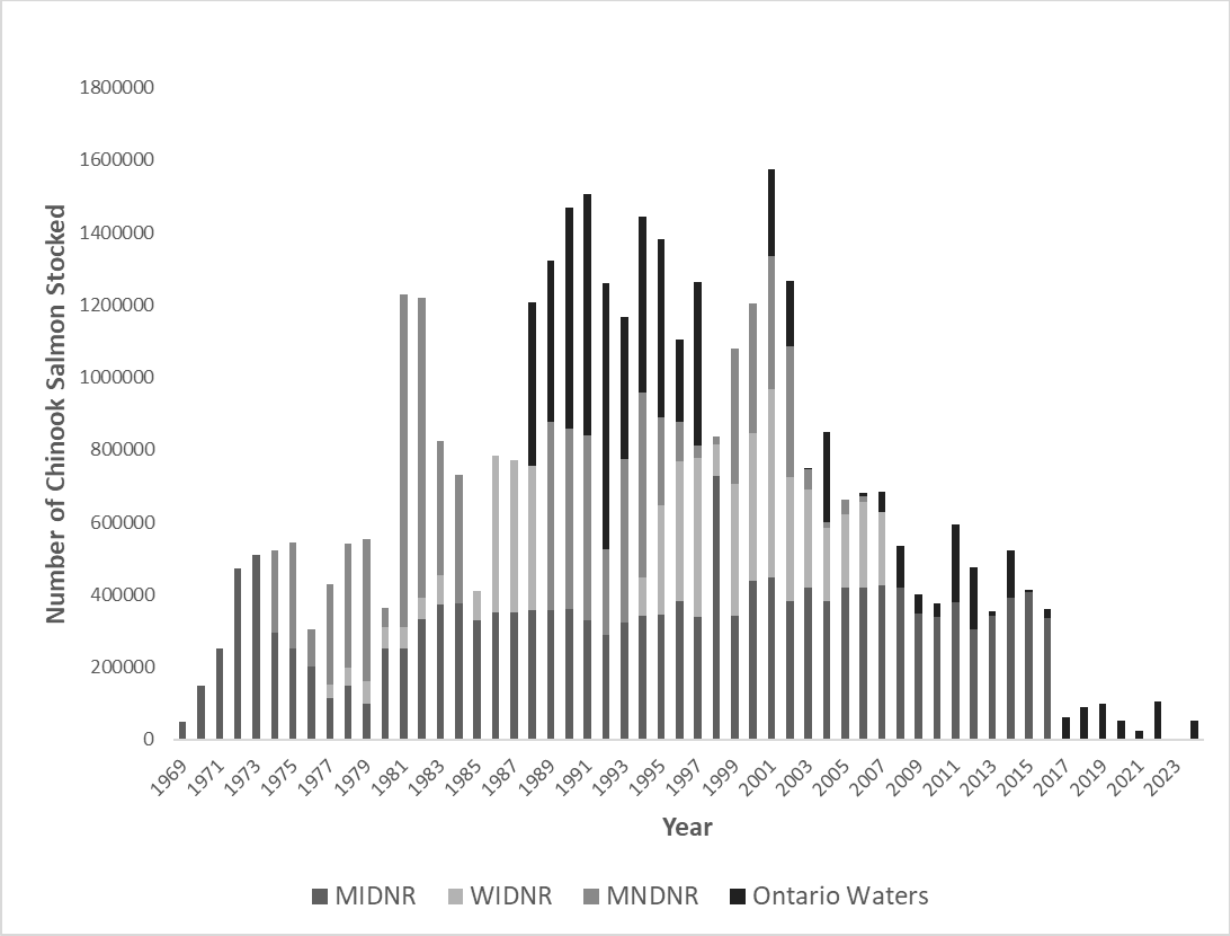

Figure 23. Chinook Salmon stocking by Lake Superior fisheries management agencies.

Table 4. Chinook Salmon effort, catch and CPUE (fish/hour) 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 5. 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 caught fish is a concern. If fish are to be released, they must be returned to the water immediately to maximize survival.
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 in a manner that is compatible with the management and rehabilitation goals for native species in Black Bay.

Chinook Salmon Ecological Target

1. Maintain a CPUE in the recreational fishery greater than 0.2 fish/hour, consistent with values observed in the 2013/14 Black Bay Access Creel Surveys.

Chinook Salmon Socioeconomic Objective

1. Reduce harvest in the recreational fishery.

Chinook Salmon Socioeconomic Target

1. 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 in the recreational fishery.
3. Work with the Thunder Bay Salmon Association to increase the survival of their stocked fish.
4. Educate anglers on the impacts of high harvest rates on naturally reproducing salmonid populations.

8.8 Rainbow Trout

Rainbow Trout Background Information

Rainbow Trout were first introduced into Lake Superior in the late 1800s and were stocked extensively throughout the 1900s by both Canadian and US fisheries management agencies (Bobrowicz, 2009). Rainbow Trout are now naturalized and 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 1980s 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 (lakewide). Currently, these programs are the primary sources of data for Rainbow Trout in Black Bay and Ontario waters of Lake Superior.

Portage Creek Mark-Recapture Population Estimate

Portage Creek is a small spring fed tributary located approximately 50 km northeast 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 on this tributary. 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 to estimate the population of adult Rainbow Trout in Portage Creek. This approach would allow the MNR to better monitor and quantify fluctuations in adult abundance and use these trends and as indicator for other Rainbow Trout populations in Black Bay, such as those in 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; in 2023, the population was estimated to be less than 50 fish (Figure 24). 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 25). 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, 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 2000s.
- Lack of information from other Black Bay streams and Black Bay proper.

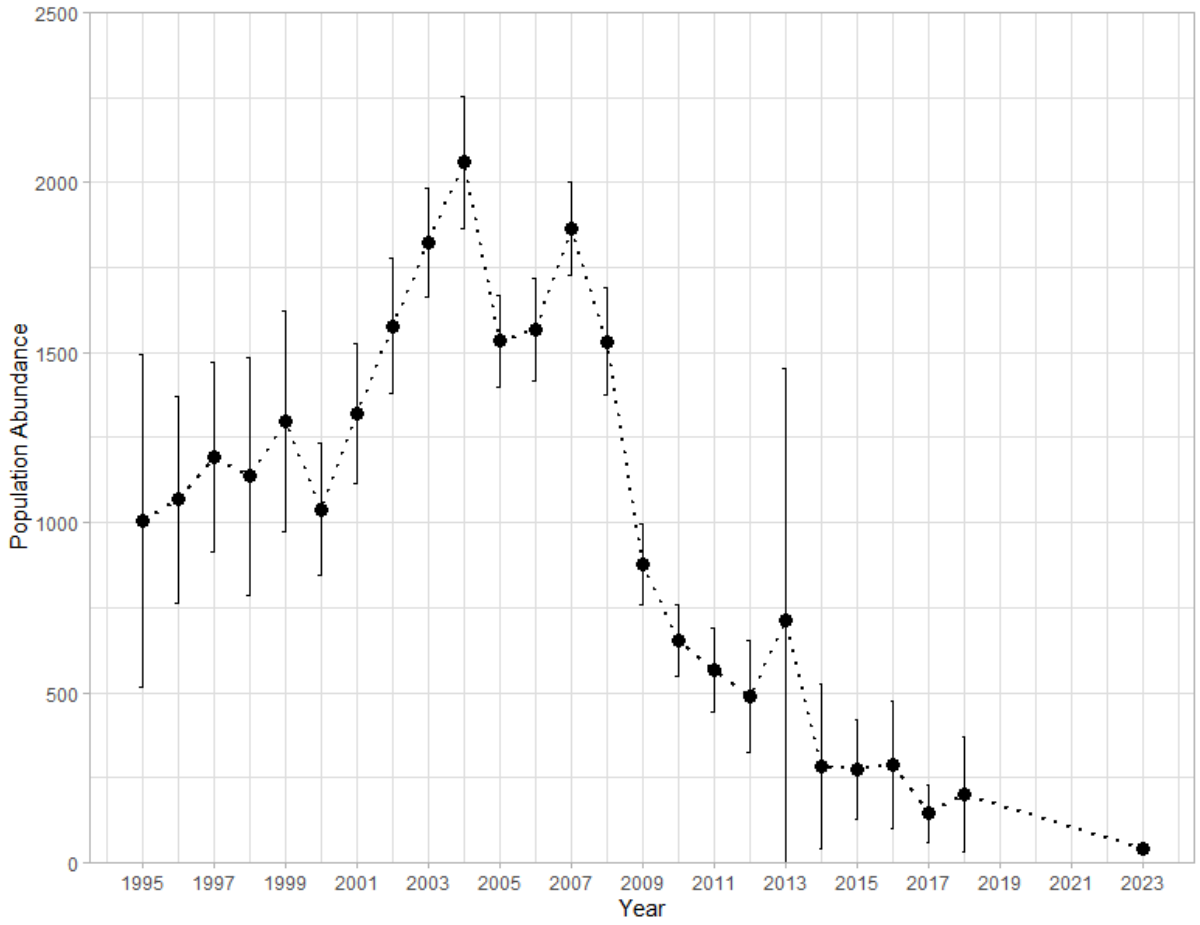

Figure 24. Rainbow Trout (Steelhead) population estimates from Portage Creek (1995-2023).

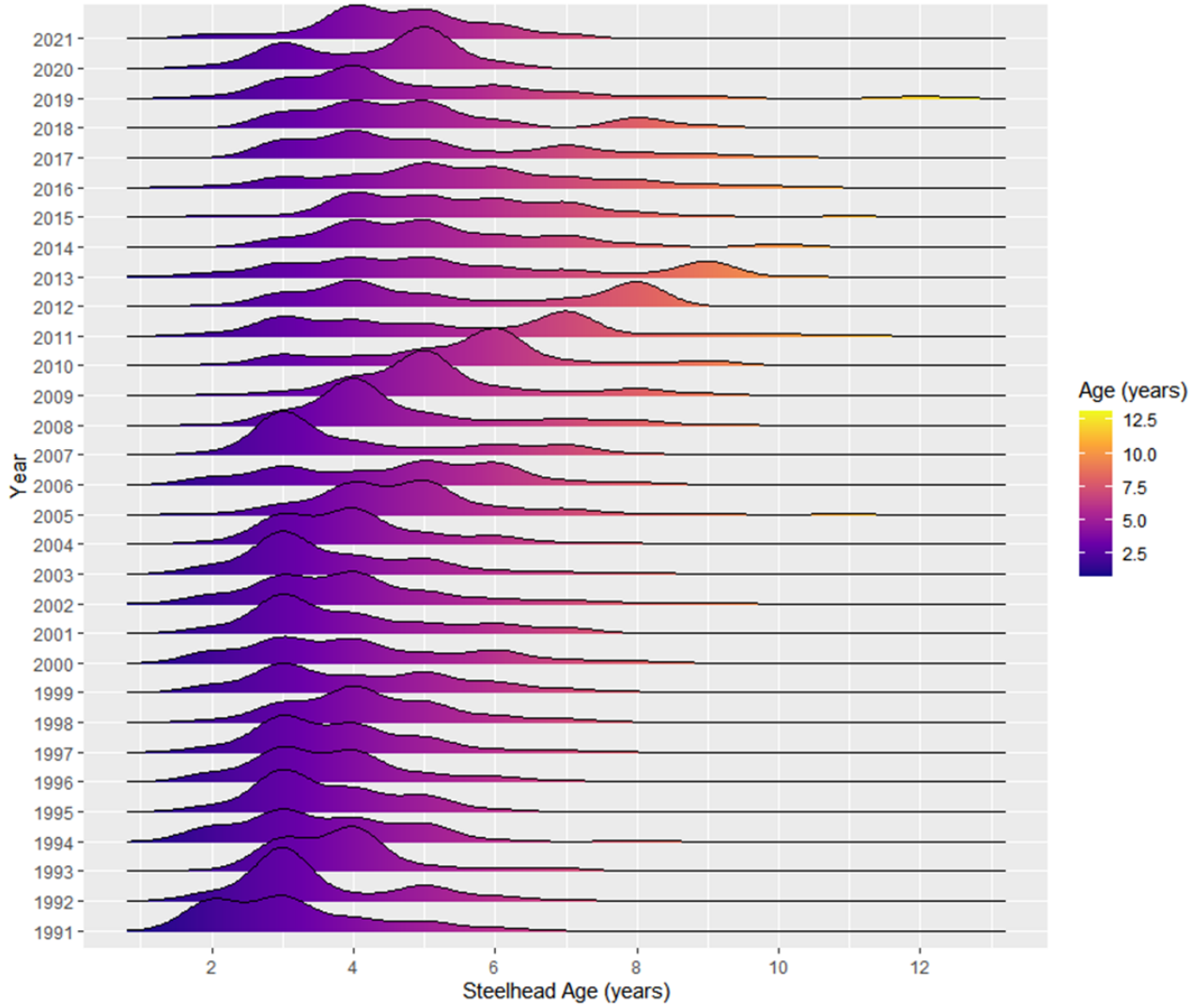

Figure 25. Portage Creek Rainbow Trout (Steelhead) age distribution (1991-2021).

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 2000s.
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 Objectives

1. Make Black Bay tributaries (Coldwater, Wolf and 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 Co-operative 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 2026 to evaluate the effects of 2 generations of changes to life history traits (i.e., shift from predominantly 1 year old smolts to predominantly 2-year-old smolts that is currently occurring).
2. Maintain 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 2026 and 2027.
4. Provide incentives to anglers to collect more samples from Black Bay tributaries through the Co-operative Angler Program.

8.9 Lake Whitefish

Lake Whitefish Background Information

Lake Whitefish are common across Lake Superior and is a 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 29% - 53.4% of the annual quota (Figure 26). 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 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.

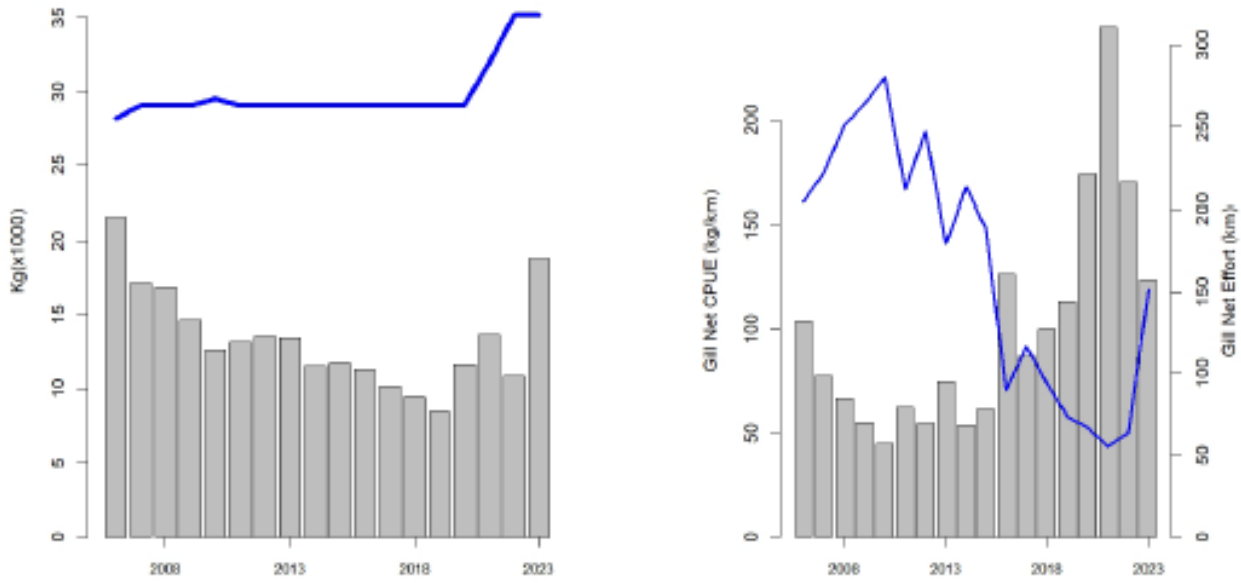

Figure 26. (Left) Lake Whitefish commercial harvest in grey bars with quota represented by the blue line. (Right) Lake Whitefish CPUE in grey bars with effort being represented by the blue line.

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 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 Lake Whitefish quotas to ensure the long-term sustainability of the species while managing by-catch of other species such as Walleye and ensuring that by-catch does not negatively impact the sustainability of other Black Bay fish populations.

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 include 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 fisheries-independent assessment surveys.
5. Adjust quotas in accordance with the Province’s Strategic Policy for Ontario’s Commercial Fisheries (2011).

8.10 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. Although 38,219 kg of Cisco quota is allocated to the waters of Black Bay, there has been no commercial effort or harvest since 2020 (Figure 27). 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).

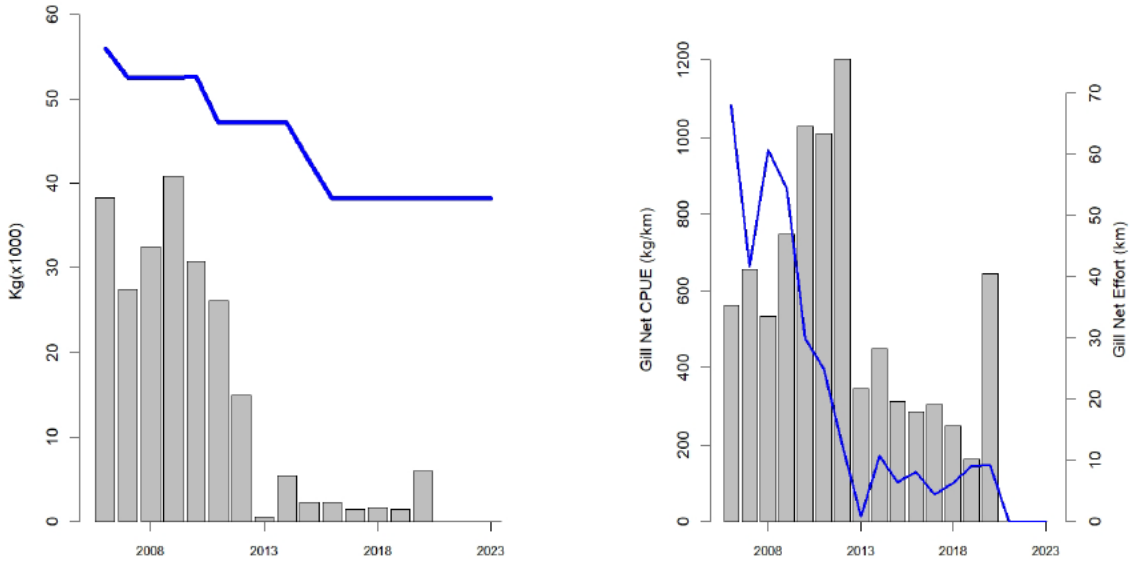

Figure 27. (Left) Commercial Cisco harvest in grey bars with quota represented by the blue line. (Right) Cisco CPUE in grey bars with effort represented by the blue line.

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

Cisco recruitment events are naturally sporadic and are often cyclical across Lake Superior. To monitor and predict Cisco year class strength, the United States Geological Survey (USGS) has conducted daytime bottom and surface trawl surveys 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 billion fish lakewide. This is nearly double the 1984 year class which was the strongest seen since the onset of the survey (Figure 28) (Vinson

et al., 2023). The exceptional strength of the 2022 year-class is expected to support Lake Superior's food web and fisheries for the next 15 to 20 years.

Upper Great Lakes Management Unit's Cisco Hydroacoustic Survey

In addition, the Ministry utilizes hydroacoustic technology in conjunction with suspended gillnets 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 29).

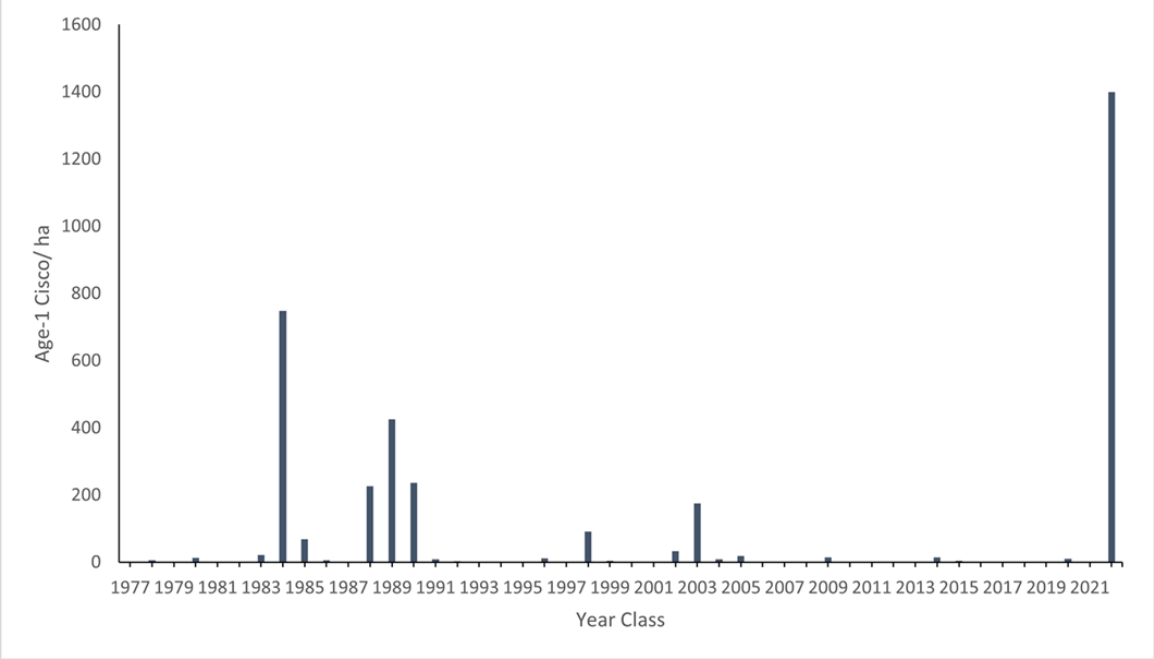

Figure 28. USGS Cisco recruitment index (Age 1 Cisco/Ha) from 1977-2022.

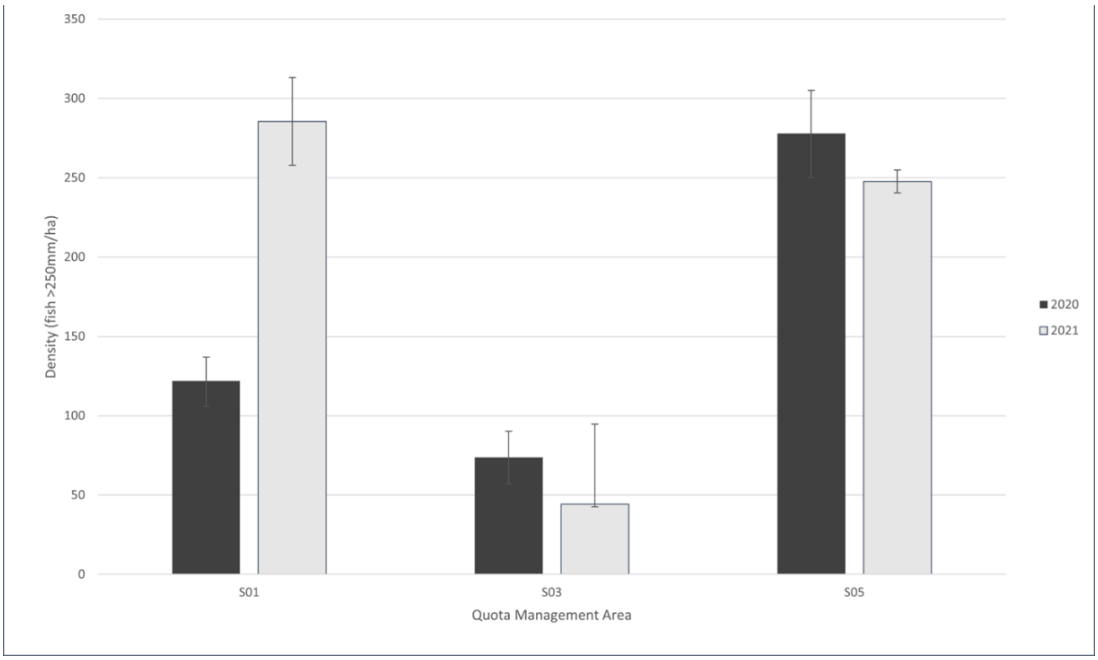

Figure 29. Estimates of adult spawning Cisco abundance (2020 and 2021) from the Ministry's hydroacoustic survey. S01, S03, S05 refer to Quota Management Areas (QMA): S01=Thunder Bay; S03=Black Bay; S05=area between Black Bay and Nipigon Bay, outside of the bays.

Cisco Background Information Summary

- Little to no commercial effort or harvest since 2020.
- Sporadic recruitment is a lakewide phenomenon.
- Record breaking 2022 year class with an estimated 2 billion age-0 Cisco lakewide in 2023.

Cisco Issues Identification

1. Sporadic recruitment events can lead to fluctuations in lakewide biomass and density.
2. Climate change may impact Cisco recruitment, as USGS models indicate that strong year classes are often associated with extensive ice cover and cold spring water temperatures.
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).

8.11 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 Coregonids. Prior to the recovery of predators such as Walleye and Northern Pike, the prey base was abundant with nearly 2,500 individuals being caught per kilometer (Figure 30) 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 can be attributed to the switch to the BsM protocol, which has more small-mesh panels than 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.

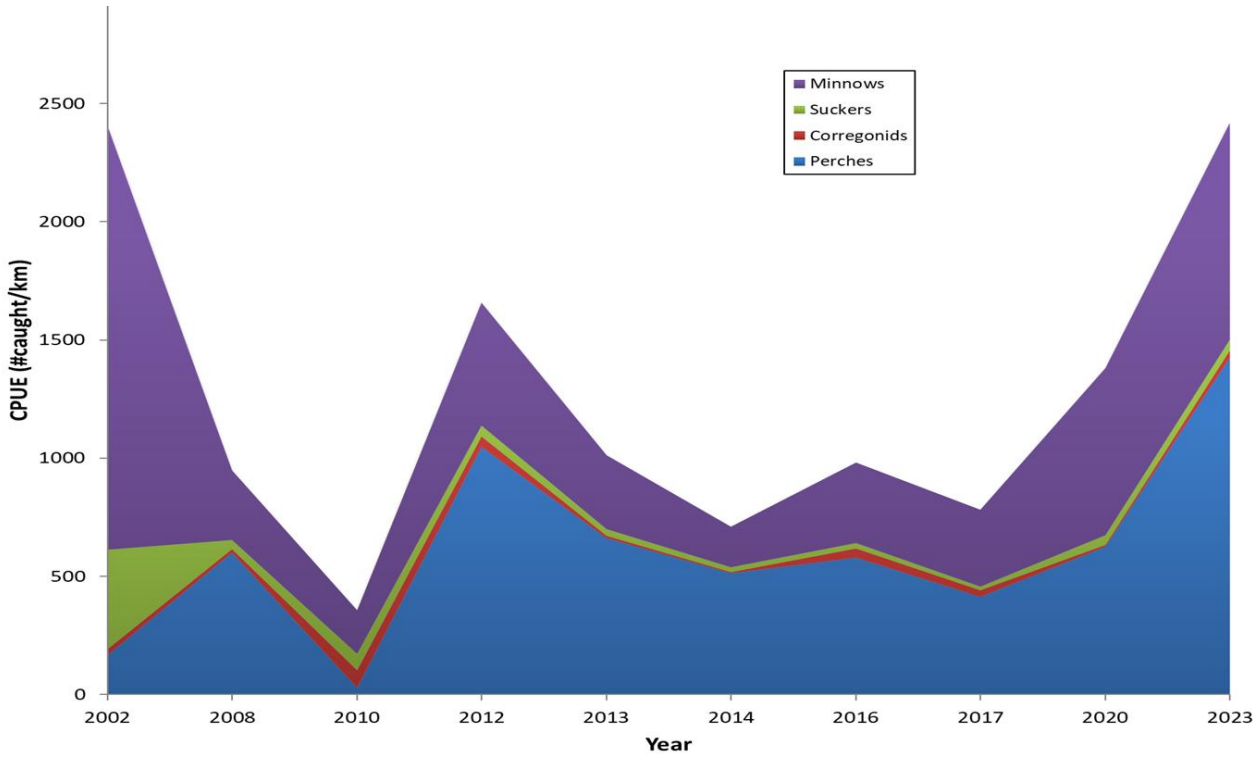

Figure 30. Prey species composition from FWIN (2002-2017) and BsM (2020-2023) surveys.

Prey Fish Issues Identification

None identified at this time 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

N/A

Prey Fish Socioeconomic Objective

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 cernua*), Common Carp (*Cyprinus carpio*), Rainbow Smelt (*Osmerus mordax*), Three-Spined Stickleback (*Gasterosteus aculeatus*) and Sea Lamprey (*Petromyzon marinus*). Rainbow Smelt appear to be the most abundant and widespread in the bay as seen in FWIN and BsM surveys (Figure 31). 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 *Dreissenid* 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 Background Information Summary

- Alewife, Eurasian Ruffe, Common Carp, Rainbow smelt, Three-Spined Stickleback and Sea Lamprey are all known to be present in Black Bay. Some invasive species may now be important prey species that help support predator populations.
- Rainbow Smelt and Eurasian Ruffe abundance appear 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.

Aquatic Invasive Species Issues Identification

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

Aquatic Invasive Species Ecological Target

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.

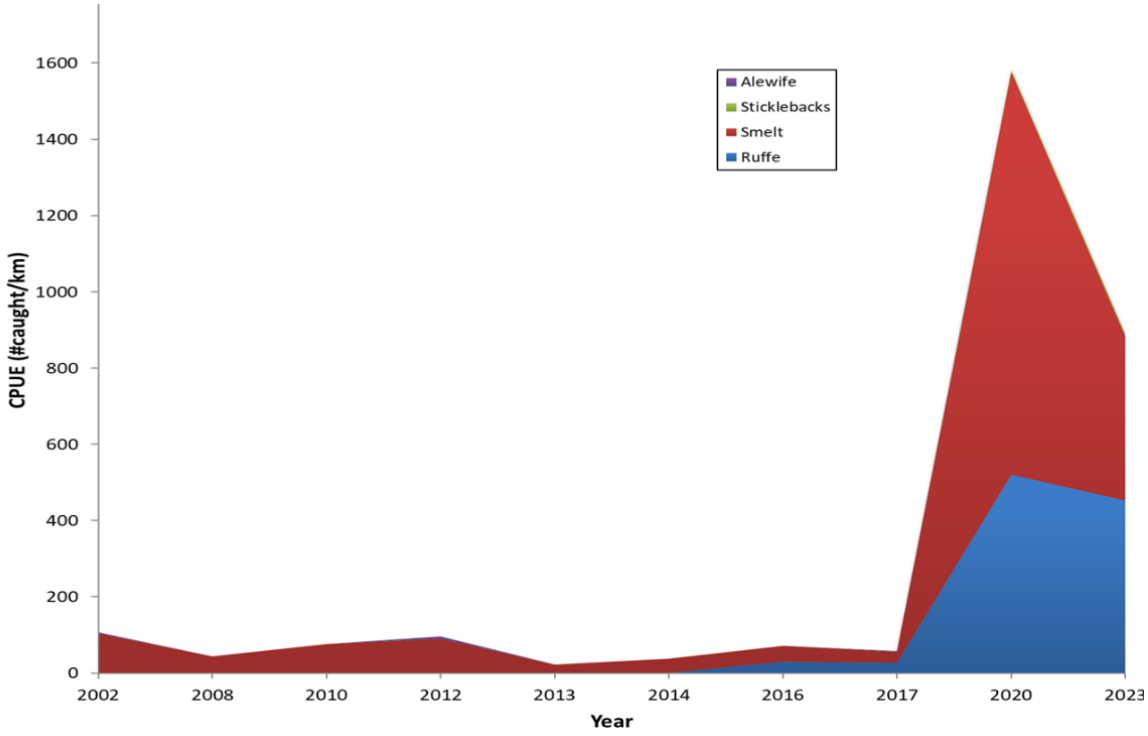

Figure 31. Aquatic invasive fish species composition / CPUE from FWIN (2002-2017) and BsM (2020-2023) surveys.

Aquatic Invasive Species Socioeconomic Target

1. Zero (0) new aquatic invasive species in Black Bay.

Aquatic Invasive Species Actions and Strategies

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

8.13 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 endangered (Golder Associates Ltd., 2011).

In June 2025, the Endangered Species Act, 2007 (ESA) was repealed and replaced with the Species Conservation Act, 2025 (SCA). While the details of the changes are beyond the scope of this plan, MECP continues to hold primary responsibility for species at risk in the province. As such, this plan did not require additional measures beyond compliance with existing provincial requirements for species protection in Black Bay. Under the previous legislation, there was a requirement to develop 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 lakewide 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 to 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, a large proportion of 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).

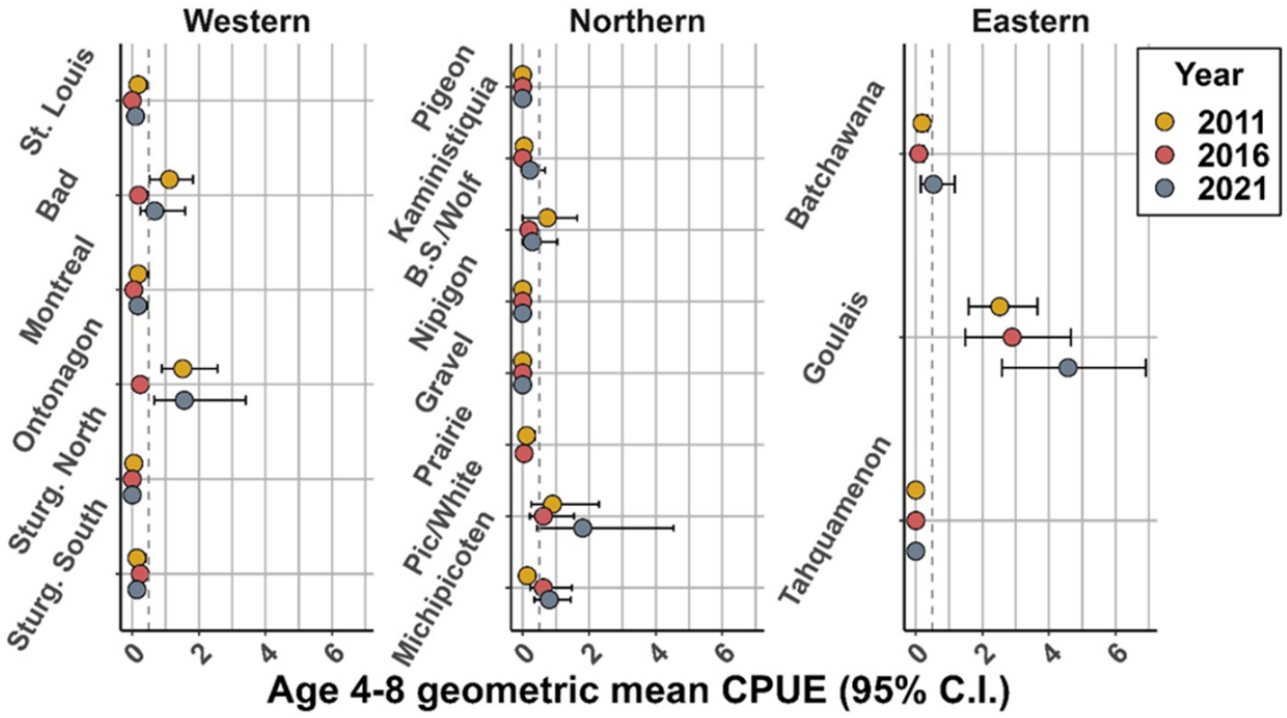

Figure 32. Relative abundance of juvenile Lake Sturgeon populations in Lake Superior as found in the Lake Superior Juvenile Lake Sturgeon Index Netting survey.

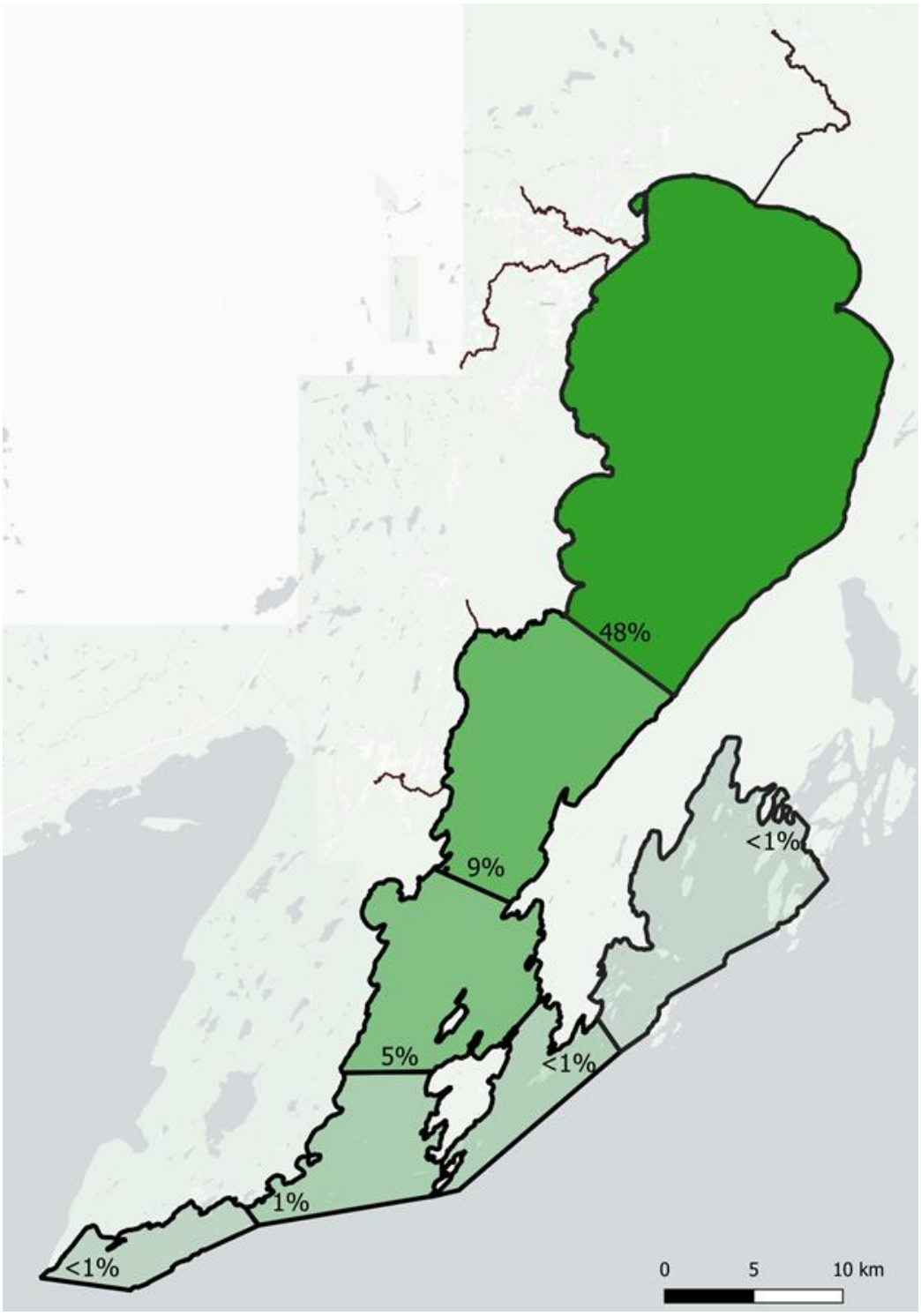

Figure 33. Lake Sturgeon movements within Black Bay.

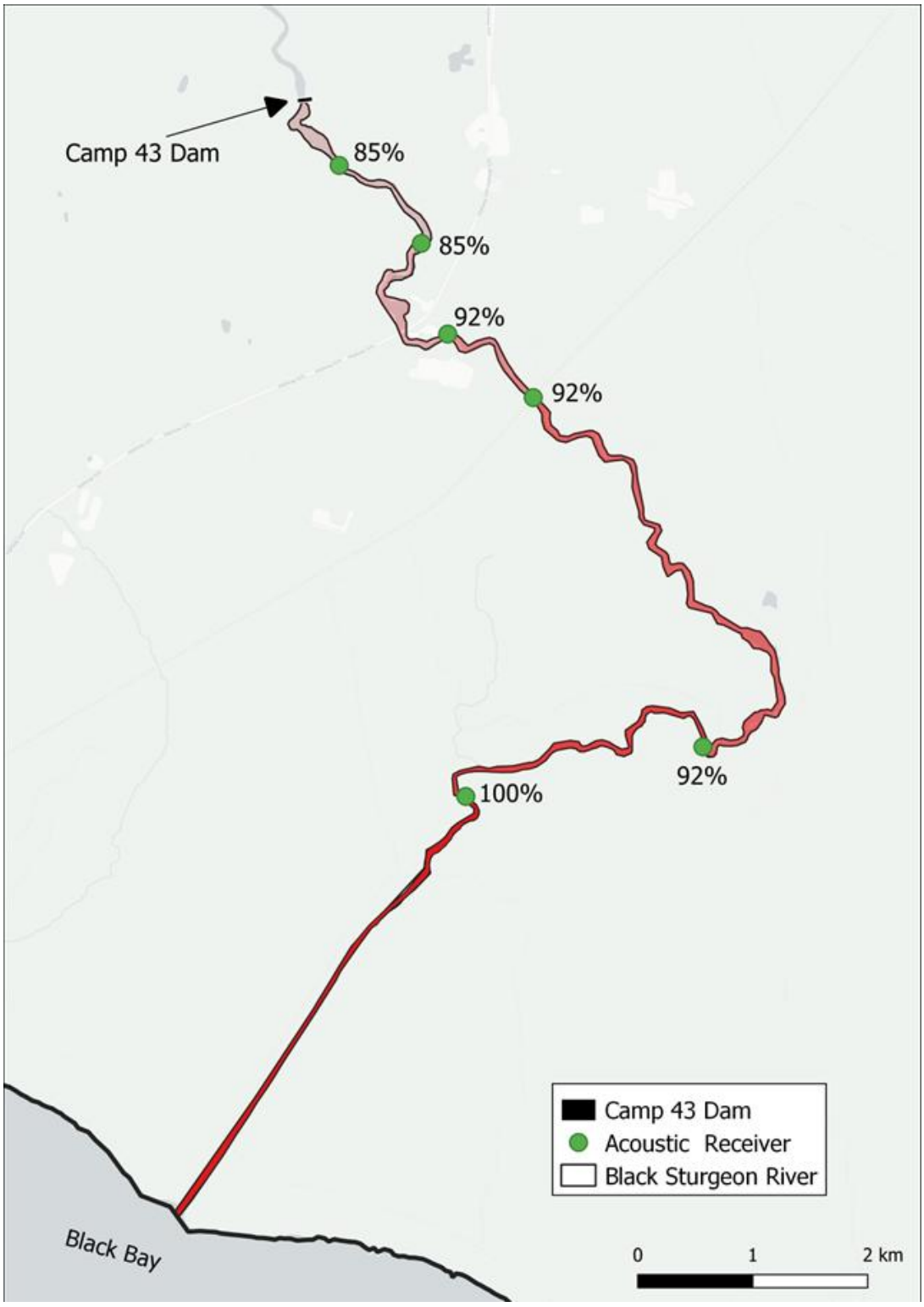

Figure 34. Lake Sturgeon migrations within the Black Sturgeon River (May - July).

9.0 Implementation, Monitoring and Plan Review

Implementation

The draft Black Bay Fisheries Management Plan was posted on the Environmental Registry of Ontario (ERO) as a proposal notice for 32 days, from August 21 to September 22, 2025. All comments received during this consultation period were reviewed and considered in the development of this Plan. A decision notice will follow, as per ERO process, to clarify how input received through the proposal notice has been incorporated. This Plan was approved, and all regulatory changes will be reflected in the 2026 Ontario Fishing Regulations. The following table outlines the regulatory changes that will be implemented:

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

Species	Current Regulation (to Dec 31, 2025)	New Regulation (in effect Jan 1, 2026)
Northern Pike	Season: Open all year. Limits: S-4 and C-2; none between 70-90 cm, not more than 1 greater than 90 cm	Season: Open all year. Limits: S-2 and C-1; S: Not more than one greater than 70 cm and none over 90 cm. C: none over 90 cm.
Walleye	Closed to recreational fishing North of Bent Island (year-round). South of Bent Island – Season: January 1 to April 14 and the third Saturday in May to December 31. Limit: 2, no size restriction.	Open to recreational fishing. Season: July 1 to December 31 (No ice fishing season). Limits: S-2, C-1, must be between 40-50 cm.

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, it is determined 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 efforts. Opportunities to meet with local Indigenous communities to review and discuss BBFMP monitoring, and assessment efforts will also be offered annually.

10.0 Summary of Consultation

The following is a summary of the consultation process:

- Invitation to Indigenous communities to participate – March 29, 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 23, 2024.
- Meeting with Red Rock Indian Band – November 18, 2024.
- Meeting with Rocky Bay First Nation – November 27, 2024.
- Meeting with the Métis Nation of Ontario (Region 2) – May 15, 2025.
- Distribution of the draft Black Bay Fisheries Management Plan to the Working Group and Indigenous communities for review – May 23, 2025 (10 day comment period).
- Environmental Registry Proposal Notice Posting (32 Days) – August 21, 2025-September 22, 2025.
- Targeted Email Questionnaire – Sent to 25,000 recreational fishing licence holders in northwestern Ontario – September 3, 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 Great Lakes Water Quality and 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
ESTN – End of Spring Trap-Netting
FCIN – Fish Community Index Netting Survey
FCOs – Fish Community Objectives
FMZ – Fisheries Management Zone
FWIN – Fall Walleye Index Netting Survey
GLFC – Great Lakes Fishery Commission
GLWQA – Great Lakes Water Quality Agreement
HBC – Hudson's Bay Company
LAMP – Lakewide Action and Management Plan
LSMU – Lake Superior Management Unit
LSTC – Lake Superior Technical Committee
MECP – Ministry of the Environment, Climate Change and Parks
MSY – Maximum Sustainable Yield
NSSA – Northshore Steelhead Association
OFR – Ontario Fishing Regulations
OMNR – Ontario Ministry of Natural Resources
QMZ – Quota Management Zone
SCA – Species Conservation Act
TBSA – Thunder Bay Salmon Association
UGLMU – Upper Great Lakes Management Unit
USGS – Unites Stated Geological Survey

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