

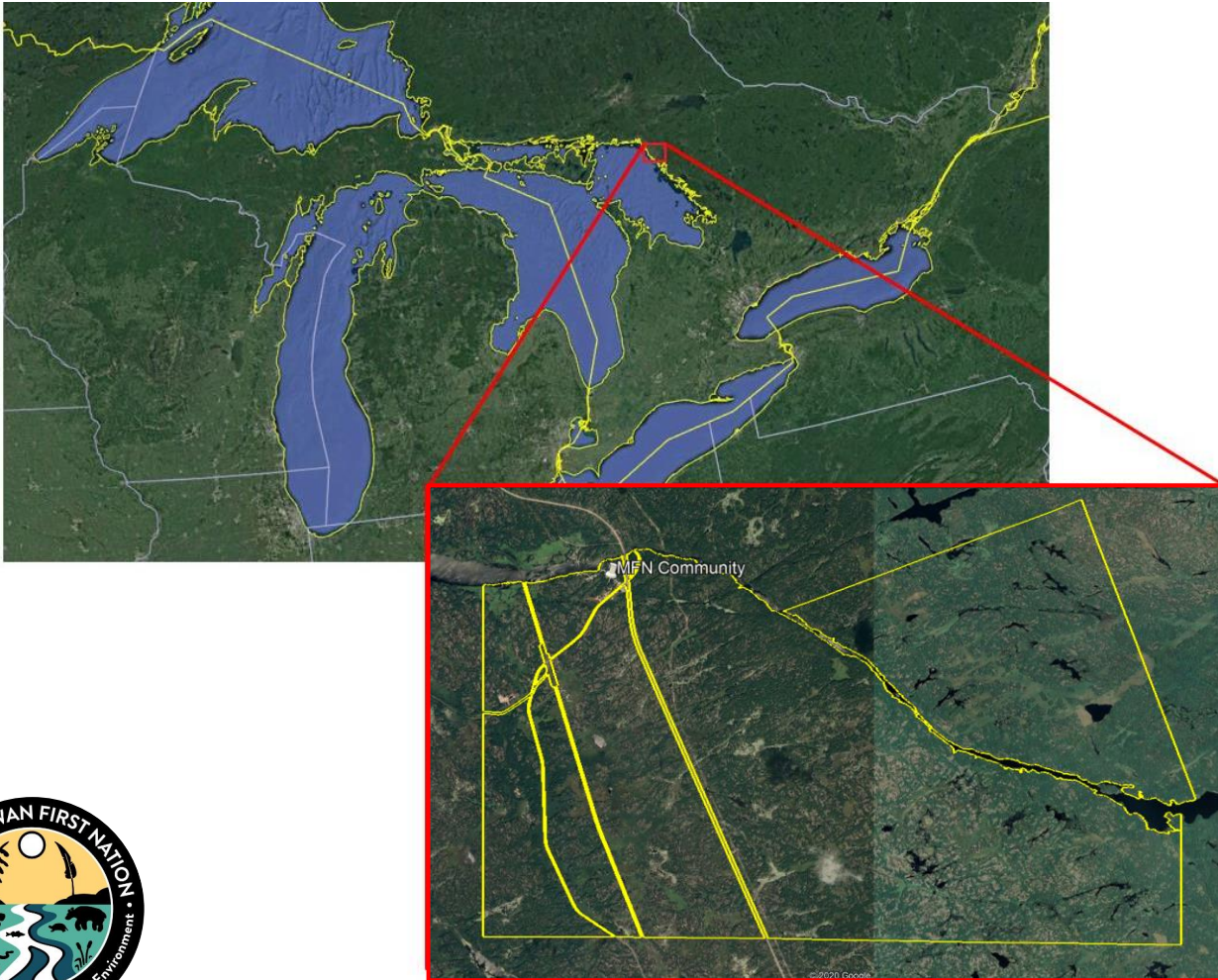


Magnetawan Department of Lands and Resources: River Monitoring and Aquatic Research

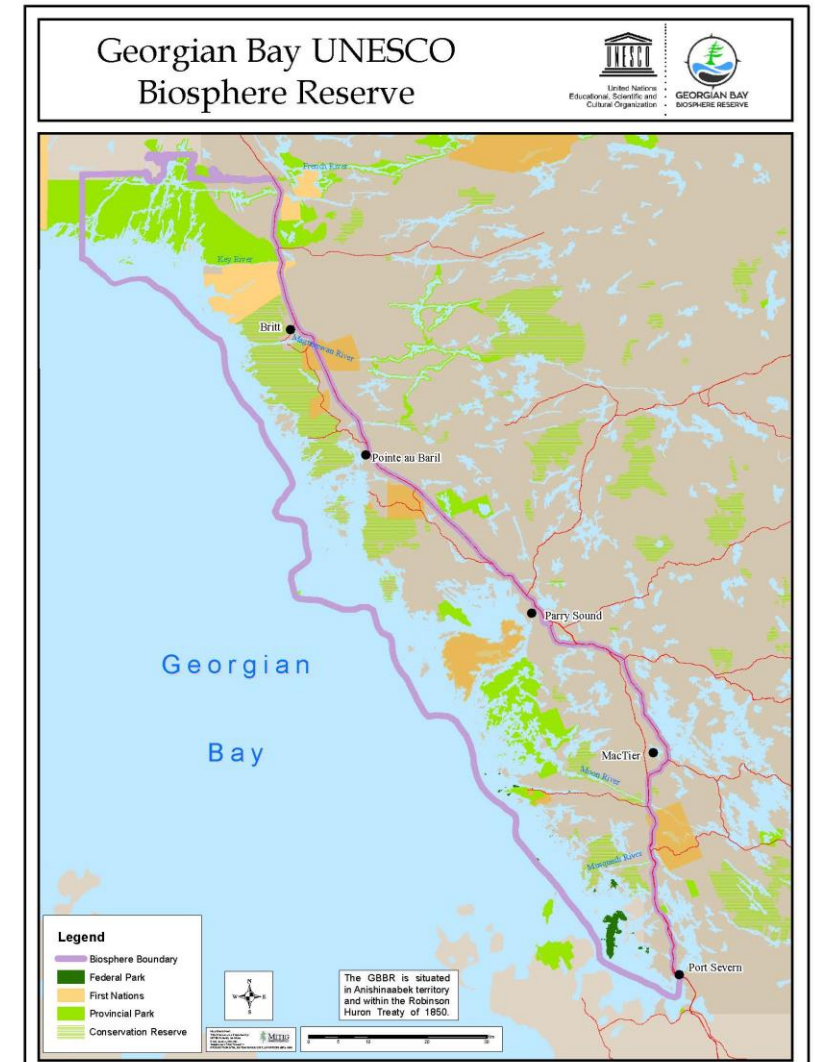
Species at Risk Biologist and Program Coordinator

Alanna Smolarz

Magnetawan First Nation



- 4700 ha
- Within the Georgian Bay Biosphere Reserve



Programs & Projects

Traditional
Land-Use &
Mapping Study

Capital Plan

AFSAR (7 years)

Environmental
Management
Plan

**Fish & River
Monitoring**

Indigenous
Community Based
Climate Change
Monitoring Program

Henvey Inlet
Wind Farm &
Transmission
Line

MTO Highway
69 Expansion

Indigenous
Guardians
Network

Land-Use Plan



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Our Species at Risk Team

We aim to provide learning opportunities for youth and foster research-based work with partners

Our Purpose

- Foster collaborations and engagement between Indigenous and academic communities.
- Weaving Traditional Knowledge into planning, research and management
- Build capacity, identify risks to Indigenous communities, lands & resources vulnerable to climate change.
- Adaptation planning
- Enforcing Land code and use





River Monitoring

Why are rivers important?

**WATER IS THE
LIFE BLOOD OF
OUR EXISTENCE**

- Provide habitat and food for aquatic species
- They carry nutrients
- Drinking water for communities
- Play large role in the water cycle
- Maintain the balance of delicate ecosystems that terrestrial plant and animal communities depend on
- Traditional ways of life & resources

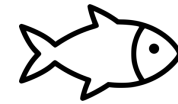
TEK & The River

Using land-based knowledge held by our Elders and land users, we were able to identify locations to monitor species based on known:

- Habitat
- Spawning grounds
- Areas threatened by river flux and climate change
- Historical areas of abundance
- Behaviour



Magnetawan First Nation River Monitoring



Fish Surveying



Invasive Species



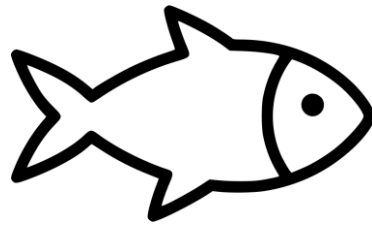
Water Contamination



Flooding



Fish Surveying



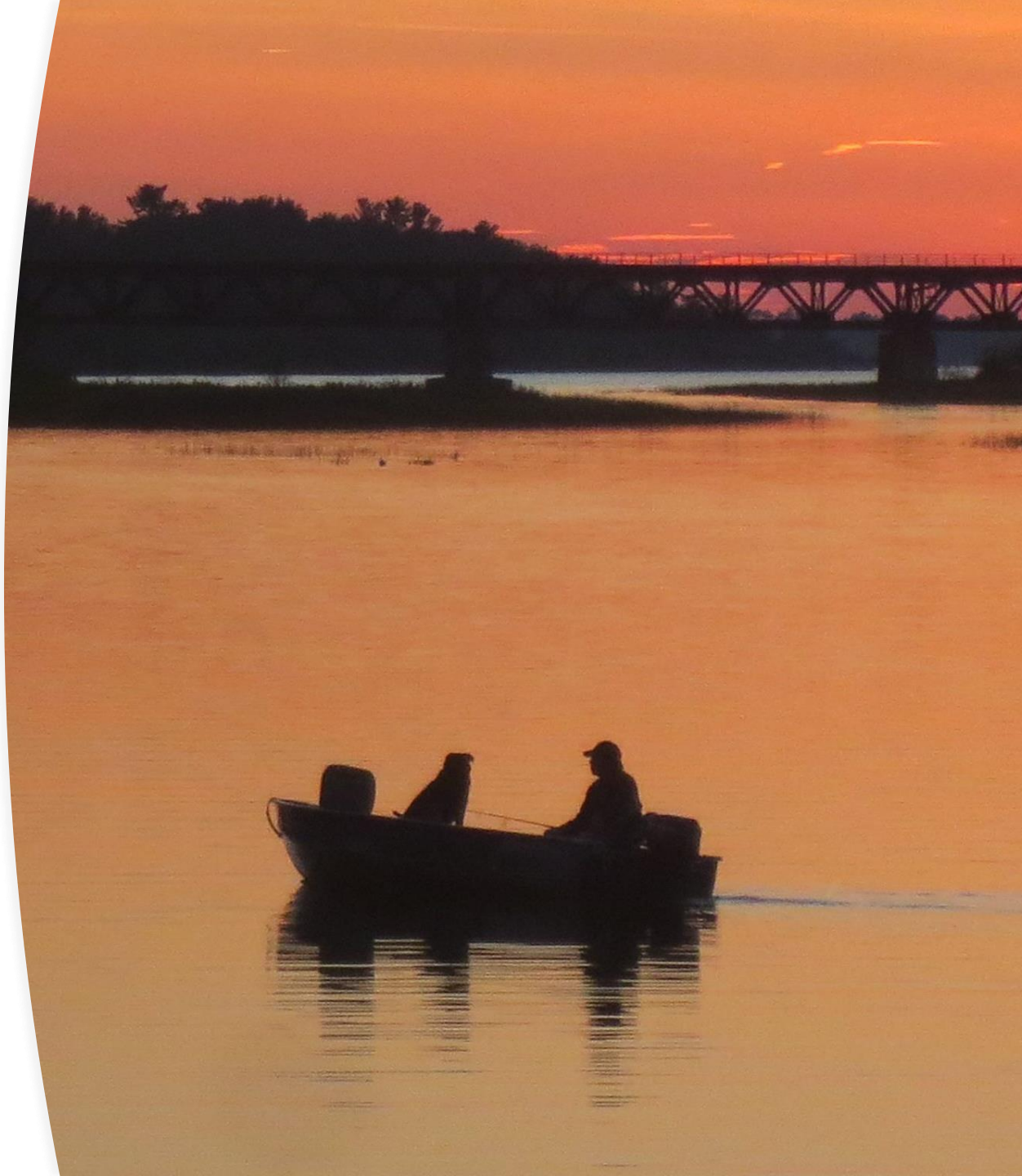
Magnetawan River Fish Habitat Assessment

Purpose

- Identify and monitor suitable spawning habitat along the Magnetawan River for spawning populations of Lake Sturgeon, Sucker species, and Walleye
- Monitor shifts in habitats across seasons
- Are Sturgeon spawning up river?

Recommendations:

- Assess spawning and collect data on flow, depth, and egg deposition at various sites on the river
- Determine if water level fluctuations upstream would be a limiting factor for successful Lake Sturgeon reproduction.
- Find the sturgeon! Where are the sturgeon!?



Walleye Monitoring

Identifying Walleye abundance and population structure

- 2014/2019-2021
- Gill nets were deployed, targeting Walleye as they were moving up the river to spawn



Walleye (Oogaa; “Oh-ga”)

- Began once again in April 2019
- Walleye and other sportfish captured in the gill nets were measured for length and weight.
- FLOY tags were applied to adult Walleye!
- **Preliminary results show a positive increase in population size**



Walleye (Oogaa)

“Wandering walleye!! A walleye tagged on the Magnetawan River in spring 2019 was caught in the St. Clair River in spring 2020. What a voyage!”

~AOFRC Facebook Update

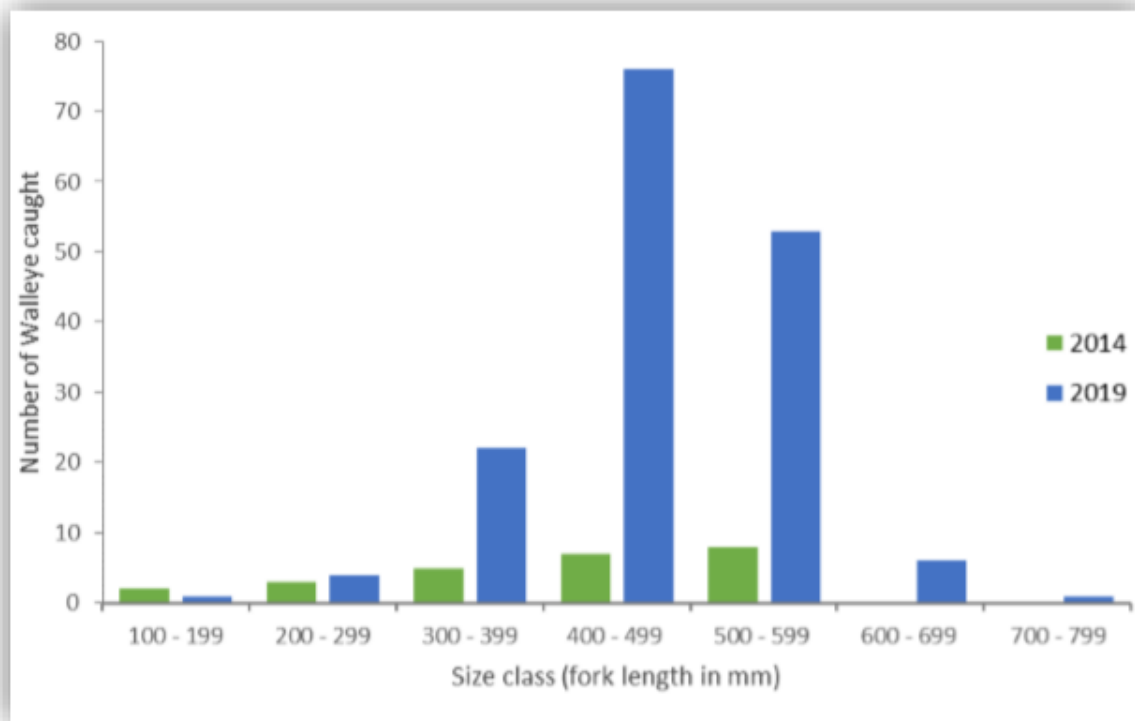


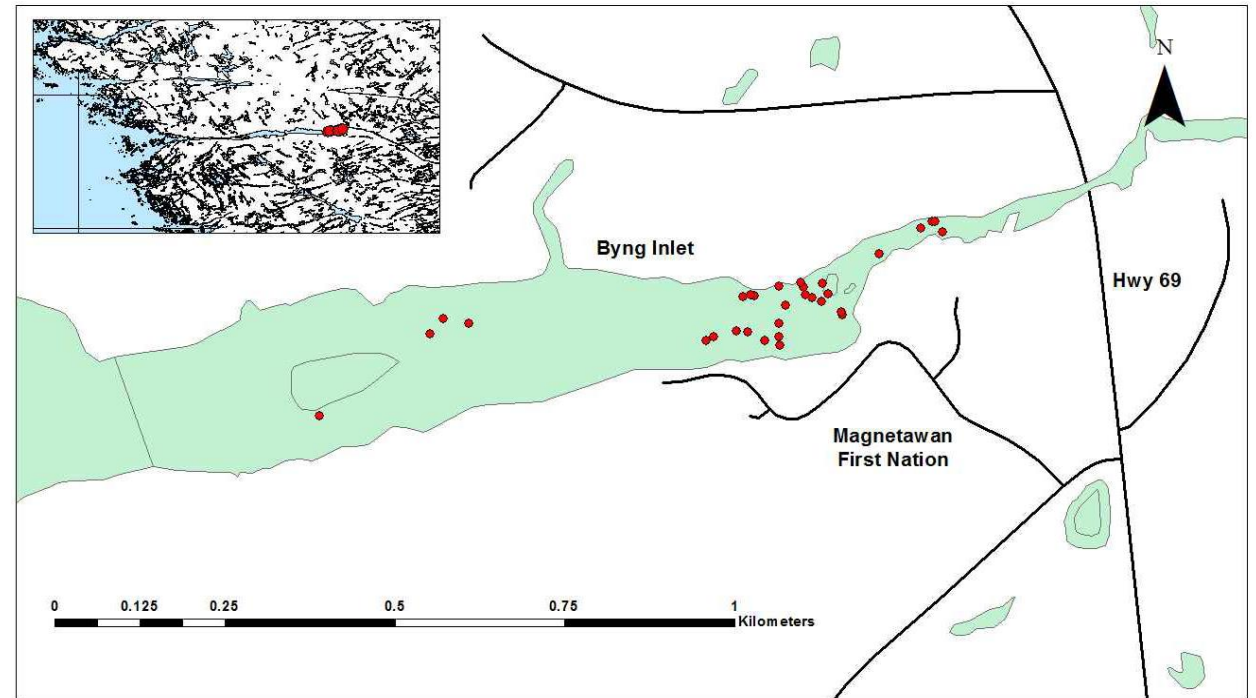
Figure 3. Size classes of Walleye captured in Spring 2014 and 2019 on the Magnetawan River during the spring spawning run.



Sturgeon (Naame; “Nawmay”)

Purpose

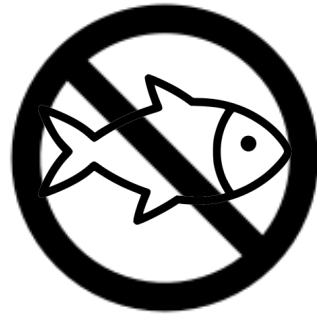
- To determine the importance of the Magnetawan River as a spawning tributary for Lake Sturgeon.
- Collect local knowledge of sturgeon and their use of the river
- Where are they though?!



But Where are the Sturgeon Though?.....



Invasive Species



Sea Lamprey

- Invasive species
- Uses it's sharp mouth to attach to fish, leaving them injured and subject to infection
- 1 individual can destroy up to 18kg of fish
- Impacts have resulted in reduced native fish stock populations

Source: Ontario's Invading Species Awareness Program



Lampricide Application

- Reduce potential for larval stage success and control potential/existing populations
- Historically this process was not well received.
- After further community engagement and working together, MFN and DFO apply lampricide every 3 years.
- Helicopter rides for community members, especially Elders, allows them to see parts of the land no longer accessible to them.



Asian Carp

Healthy, stable ecosystem



It's not just one species, it's 4!

- Grass Carp
 - Silver Carp
 - Bighead Carp
 - Black Carp
-
- Outcompete native species for food and space

"Can be considered one of the greatest threats to the Great Lakes!" — Ontario's Invading Species Awareness Program



Asian Carp Monitoring Program

- Annually (except this year), DFO monitors fish communities in the lower Magnetawan River for invasive species and their habitats, with a special focus on Asian carp
- Using electrofishing boats, fyke and trawl nets they inventory the biodiversity of the river and identify invasive sp and suitable Asian carp habitat
- Provide MFN staff with new learning opportunities
- Have yet to find any in the river!

Phragmites

- Partnered with Georgian Bay Forever, we spent an entire day on the river removing phragmites from the Magnetawan River!

GEORGIAN BAY
FOREVER



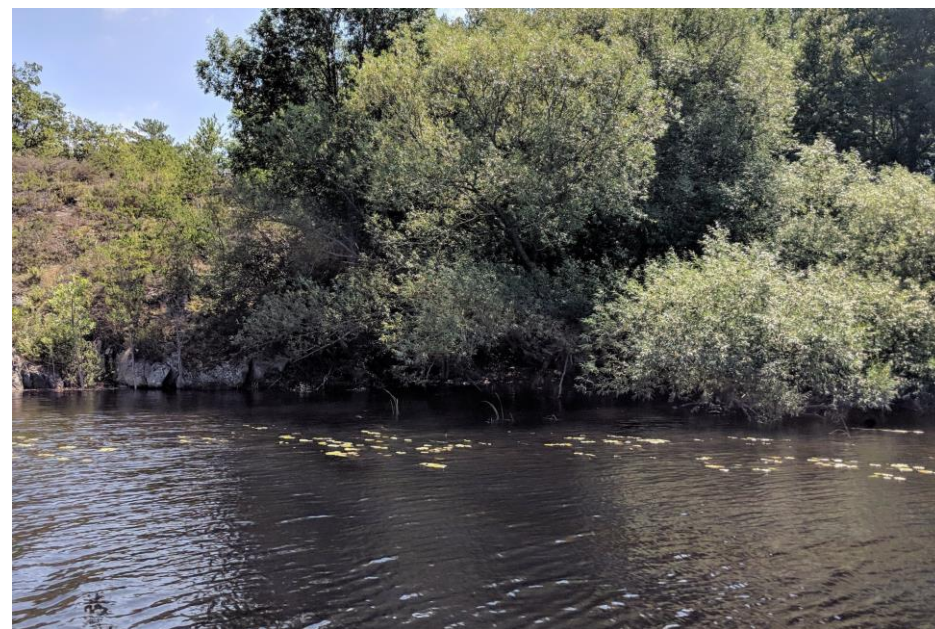
Protecting your water.



Before



After

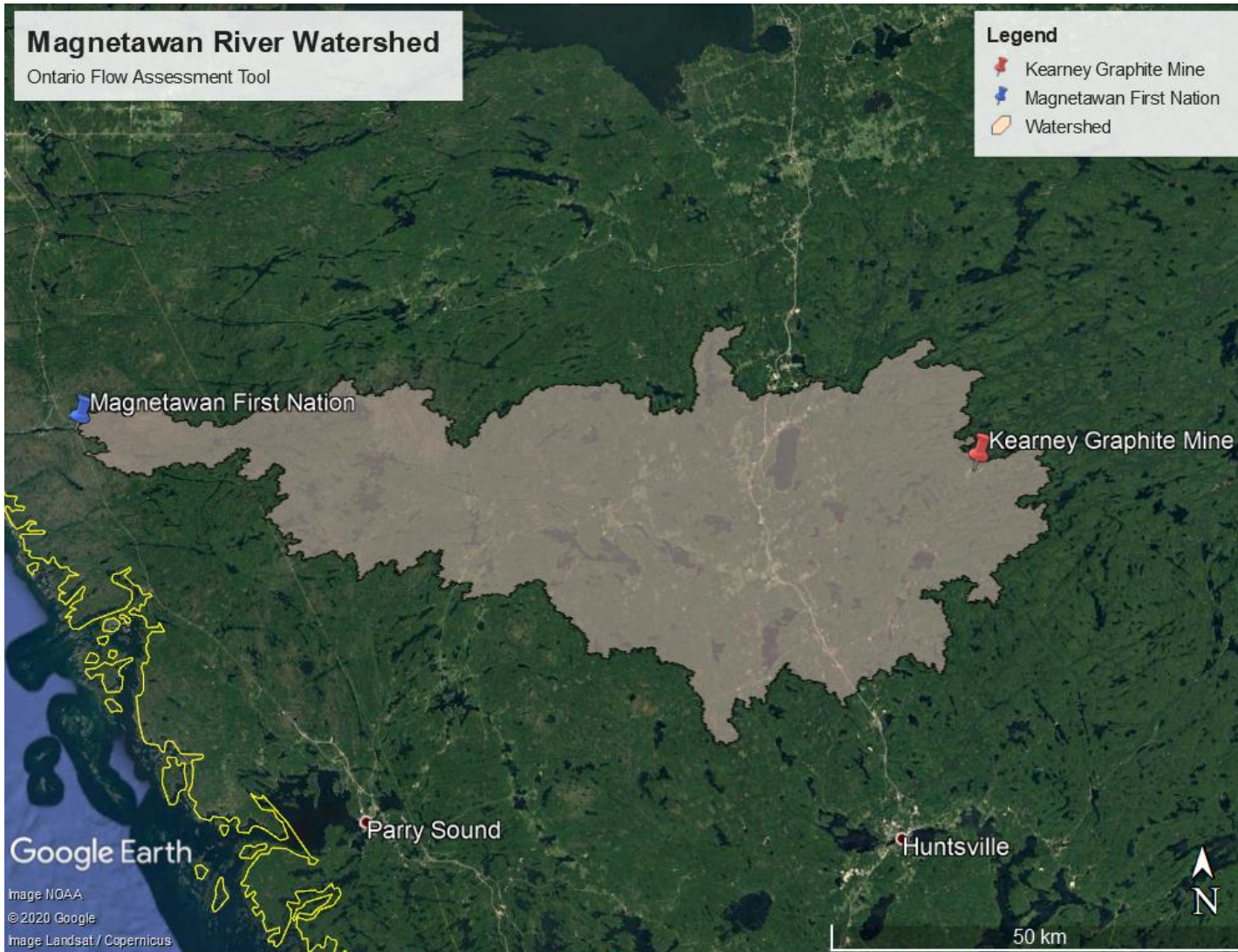


Water Contamination



Kearney Graphite Mine





| | |
|--|----------|
| Drainage Area (km ²) | 2743.533 |
| Length of Main Channel (km) | 207.657 |
| Maximum Channel Elevation (m) | 515.04 |
| Minimum Channel Elevation (m) | 176.93 |
| Slope of Main Channel (m/km) | 1.63 |
| Slope of Main Channel (%) | 0.163 |
| Area Lakes/Wetlands (km ²) | 361.785 |
| Area - Lakes (km ²) | 244.946 |
| Area - Wetlands (km ²) | 116.839 |

Kearney Graphite Mine Contamination



Mining Activities at Kearney Graphite Mine have contaminated Graphite Lake, the headwaters of Magnetawan River, and possibly the headwaters of Tim River with acidic runoff & toxic metals



MNR has documented acid leakage and significant declines in the abundance of fish over the 10 years of operation at the site



MNR fisheries report noted “given the obvious decline in fish abundance in conjunction with the documented decline in lake water chemistry since the development of the mine it is logical to conclude that the loss of fish is related to past mining activities. Remedial measures must solve problems at their source and not just mask the symptoms or redirect waters to less sensitive systems”.

Flooding



Floodplain Mapping

FLOODPLAIN MODELING AND CLIMATE CHANGE ADAPTATION REPORT

Prepared for: Magnetawan First Nation
In partnership with Crozier & Crozier Associates Consulting Engineers
July 17, 2020



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Figure 1. Study Area



Spring 2019



Today



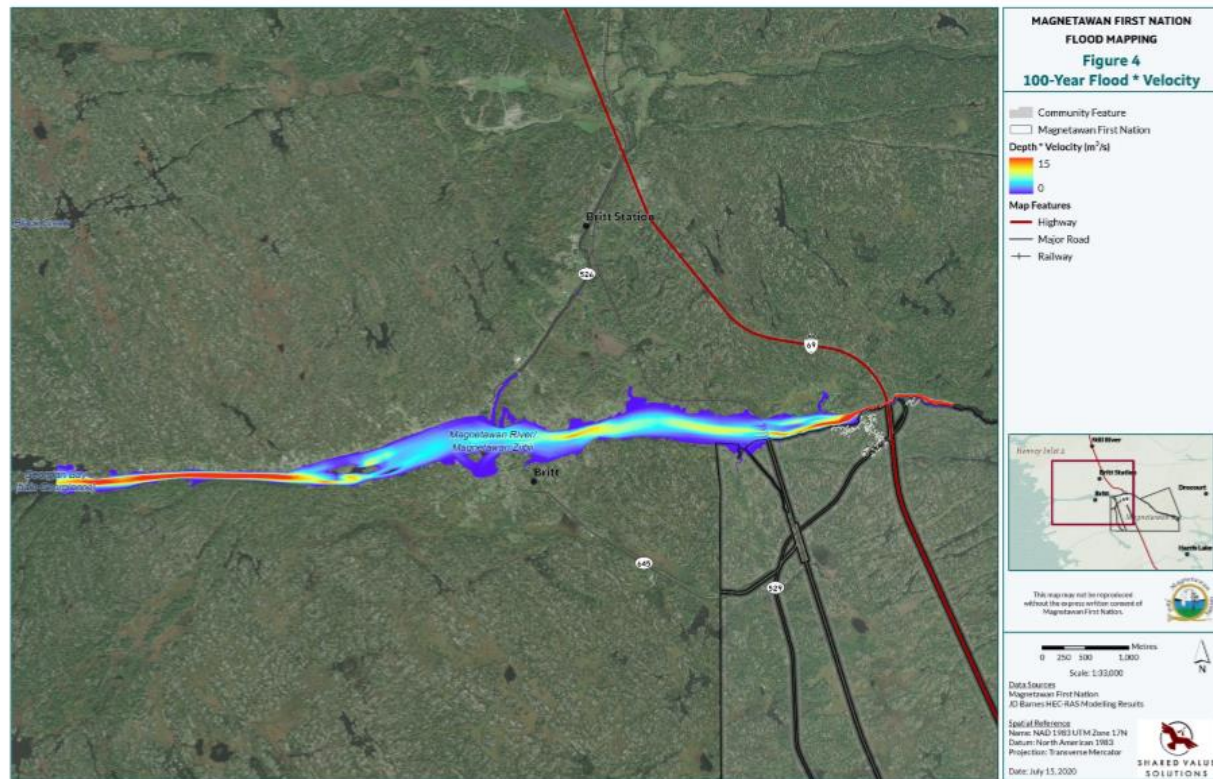


Figure 3. 100-Year Flood Depth & Velocity Model.

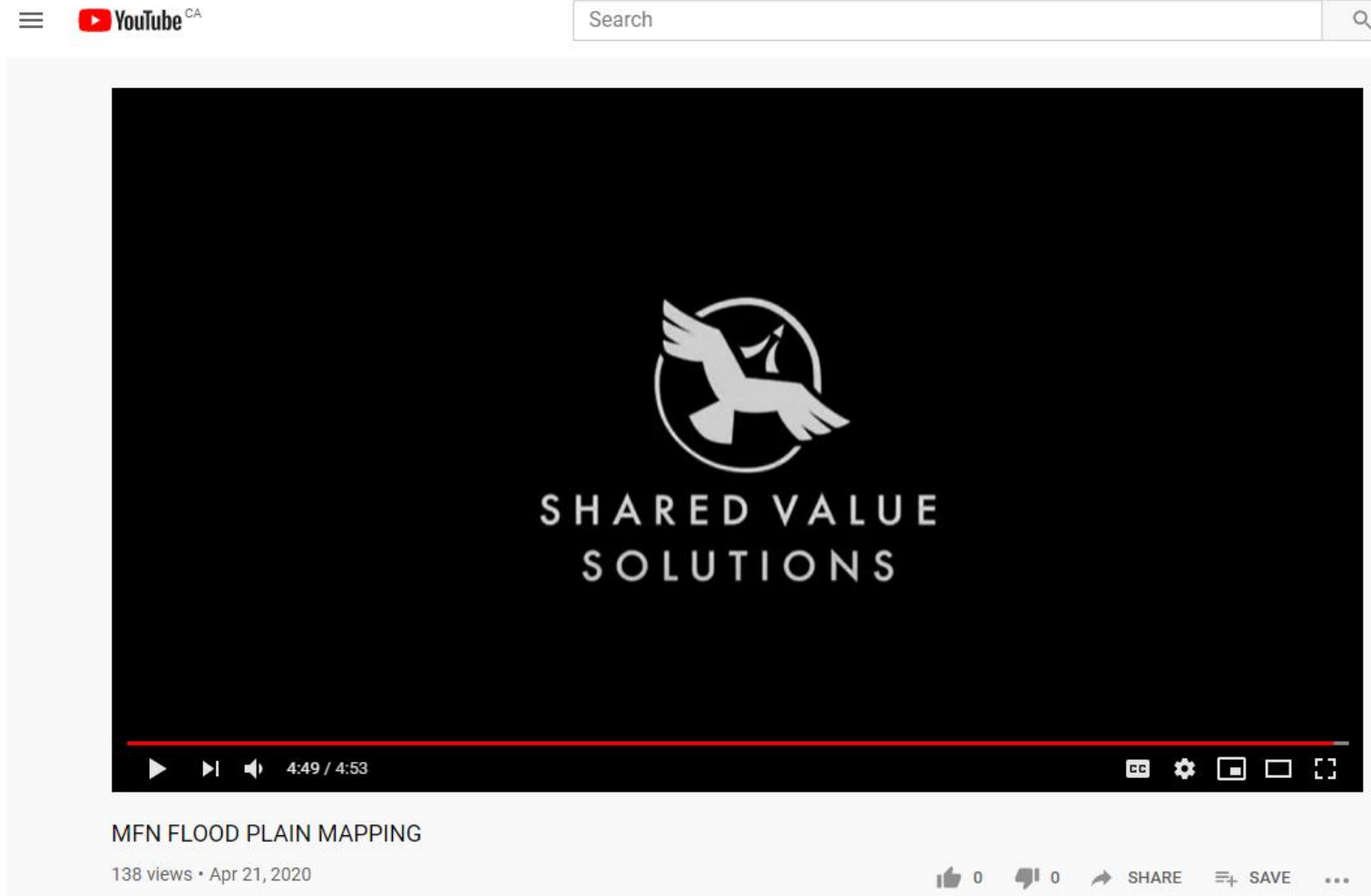


Figure 6. Spawning habitat at Deadman's Rapids (from Figure 22 of EGBSC, 2016)



Concerns for the future

- Drinking water quality
- Fish spawning
- Housing
- Destruction of culturally significant areas



<https://www.youtube.com/watch?v=BUR7pLZikTQ>





Why Do we Do What We Do??





Questions?

