GEORGIAN BAY FOREVER

Protecting your water.

SPRING 2016
VOL 7, ISSUE 2

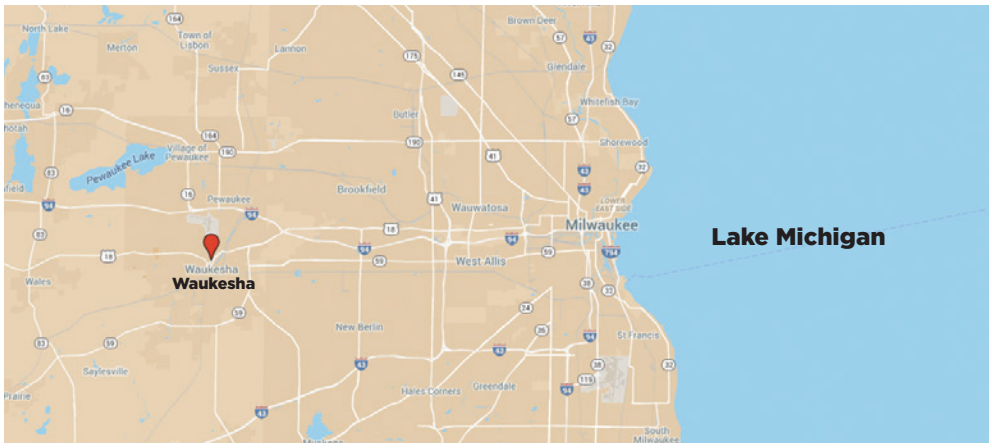
WATER LEVELS, WATER QUALITY AND ECOSYSTEMS

ARE WE NEXT?

THE ASIAN CARP IN OUR BACKYARD

ALSO INSIDE:

WAUKESHA, WISCONSIN'S WATER DIVERSION APPLICATION



How do you balance people's expanding needs for safe drinking water while protecting the Great Lakes? The City Of Waukesha is looking for an answer as they await a decision on their Lake Michigan Water Diversion application.

Some background

Waukesha is a community of 71,000 whose deep groundwater supply is contaminated with increasing levels of radium which will, eventually, make it unsafe for drinking. The town sits on the border of the Great Lakes watershed making it a straddling community, which, by provision of the Great Lakes Agreement[1] allows it to apply to divert Lake Michigan water. Of course, their application must meet strict criteria.

The application

Waukesha is working to comply with all the requirements for maintaining environmental integrity through the extensive application process, painstakingly arrived at by the Great Lakes Compact.[2] The proposed diversion represents only about 0.0118%[3] of the renewable Lake Michigan Huron resource, i.e., the 1% annual renewed water; its impact to the Lake levels is negligible. In addition, Waukesha plans to return 100% of the volume of the water diverted, back to Lake Michigan.

Opening the floodgates?

The Great Lakes Compact was created to prevent large-scale water diversions from consumers like California or Asia. It is difficult to know where to draw the line as water needs become more challenging in the future. Could this application, in effect open the floodgates, encouraging local communities to request water from the Great Lakes, instead of caring for and sustaining their local water supply?

The Ontario government, which does not have voting authority under the Agreement[4] but whose views will be considered, is particularly concerned about the way in which the wast water will be returned and the standards of water quality discharge. The government also noted that it is not apparent that some communities included in the Waukesha diversion currently have the same supply issues as Waukesha does. Futhermore, the government acknowledged that this application is precedent setting and is likely to spur many other diversion applications for similar reasons that could affect water quantity.[5]

At GBF, we believe this application is an opportunity to discuss limits on what percentage of the renewable waters of the Great Lakes should be made available sustainably to humans, while ensuring the ecosystems of the Great Lakes are protected.

Stay tuned . . .

An official decision is expected in May, following the publication of this article. Please check our website at GBF.org for an update.

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[1] Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement, signed 2005.

[2] The Great Lakes compact, effective 2008

[3] David Sweetnam, comment submitted to the City of Waukesha Diversion application, http://www.waukeshadiversion.org/media/1691/comment-form-submissions.pdf, (March 14, 2016)

[4] Great Lakes – St. Lawrence River Basin Sustainable Water Resources Agreement, signed 2005.

[5] Mehta, Diana. (2016, April 1). Ontario takes issue with Wisconsin city's Great Lakes water diversion plan. Thestar.com. Retrieved from http://www.thestar.com/news/canada/2016/04/01/ontario-takes-issue-with-wisconsin-citys-great-lakes-water-diversion-plan.html

GEORGIAN BAY FOREVER

Georgian Bay Forever is a community response to the growing need for major research and education to sustain the Georgian Bay aquatic ecosystem and the quality of life its communities and visitors enjoy.

We help monitor the Bay's well being, throughout the seasons, year after year.

We fund the research needed to protect the environmental health of Georgian Bay and the surrounding bodies of water. Using our research findings, we inform and educate the general public and governments about threats to environmental health and propose possible solutions.

Through workshops and seminars we are educating the Georgian Bay community. By teaming up with reputable institutions, we enhance the credibility of our research and we strengthen our ability to protect what's at stake.

Georgian Bay Forever, formerly the GBA Foundation, is a registered Canadian charity (#89531 1066 RR0001). We work with the Great Lakes Basin Conservancy in the United States, as well as other stakeholder groups all around the Great Lakes.

Deeply rooted and broadly drawn, Georgian Bay Forever is steered by lifelong devotees of the Bay. We are committed advocates, educators, environmentalists, realists, idealists, and of course, residents.

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Canadian citizens may send their donations to the Caledon address above.

U.S. citizens wishing to make a donation to support our work can do so by giving to:
Great Lakes Basin Conservancy
PO Box 504, Gates Mills, OH
44040-0504, USA

This newsletter is just a snapshot of our work. For the most up-to-date information on our projects, longer versions of newsletter articles and breaking news about Georgian Bay, please become a regular visitor to our website and Facebook page.
GBF.ORG

Design by Key Gordon (keygordon.com)
Editor: Helen Bryce

Follow us on

HELP US IDENTIFY THE TOP 10 THREATS TO THE BAY

By Peter Singer

Our information sources, whether they are digital devices or printed articles, seem to be filled with thousands of bad news stories — so much to worry about.

It can be overwhelming — like attempting outdoor cottage work in a tsunami of black flies! How do you tune out the irritations and still focus on what's important in order to complete the task? It would be much easier to escape inside to more comfortable distractions …

To cut through the tsunami of information, Georgian Bay Forever is working on the development of a top 10 list of threats to the Bay. This list will be developed in consultation with: the Science Advisory Group and Science Committee, other experts and organizations and people like you, who care about Georgian Bay.

A critical mass of 10

We think it is important to have a process that accumulates as much input as possible on the threats to Georgian Bay, digests that information meaningfully and refines those threats down to a critical mass of 10. This process will allow for a more intense focus of resources while attaining broader comprehension in the Georgian Bay community for potential remedial research and project work. The top 10 list will be widely distributed when the process is complete.

How can you participate?

As a valued stakeholder to GBF, your opinion is important to us. To ensure that the Top 10 reflects your thoughts on the Bay, please participate by visiting our website at http://georgianbayforever.org/survey.

We also encourage you to sign up for our email and other social media outlets, as GBF is always considering more environmental and efficient ways of communicating with you.

Enjoy summer 2016 from all of us at Georgian Bay Forever!

OUR DONORS AND OUR PARTNERSHIPS ARE CRITICAL TO OUR WORK AT GBF

By David Sweetnam

THERE ARE MANY ISSUES THAT CONFRONT US DAILY HERE AT GEORGIAN BAY FOREVER:

1. Thirsty communities with an eye on the Great Lakes;
2. Asian carp knocking at our door and threatening our ecosystems in swarms you have seen in countless internet videos leaping 10 feet out of the water;
3. Eurasian water milfoil and Phragmites choking out native biodiversity in our coastal wetlands;
4. Nutrients in effluent from agriculture and sewage treatment continuing to flow into the Lakes resulting in toxic algae blooms, degraded water quality and ecosystems in closed embayments that threaten our drinking water;
5. The effects of climate change on the ecosystems and economies of the Great Lakes;
6. Availability of basic information such as high-resolution coastal bathymetry images.

There is a long list of priorities that must be reviewed so we can identify the most critical challenges that need to be addressed, efficiently and effectively.

Our donors

Thankfully, we have donors like you who support our unique role working in partnerships with others around the Bay, initiating research and other special projects and often providing the critical funding needed to gain matching support from other sources.

Without your support, we would not be able to focus on issues that include education about threats to the Bay, community-based invasive Phragmites control to protect coastal wetlands, DNA barcording to help gage human impacts on the Bay's ecosystems, supporting fish habitat assessment, standardizing water quality protocols, working on Great Lakes water level management and more.

Our partnerships

GBF is one of a handful of groups hard at work around the Bay and one of hundreds of groups working to protect the Great Lakes. Working with other groups that all have a specific focus may sometimes be confusing to the public, but these partnerships allow all of us to share expertise, equipment and staff to get the many jobs done.

These partnerships are critical to protecting our water and bringing Georgian Bay Forever's voice to the table. Whether we're working with NASA, the University of Guelph, the Nottawasaga Valley Conservation Authority, the Georgian Bay Biosphere Reserve or others, GBF's focus on water is important to every project and person around the Bay.

Our work

We are proud to share the results of our work, here, in our newsletters, on our website, and in person at GBF events. Rest assured that GBF, and our many colleagues and friends, are working constantly to protect the Bay…forever.

STOPPING ASIAN CARP

Asian Carp & Common Carp

More details at http://georgianbayforever.org/asiancarp-species/

Species & Latin name		Growth/ Life Span	Average Weight/Length
Bighead Carp *Hypophthalmichthys nobilis*		2-3 yrs/ 16+ yrs	18kg/ -1.5 m
Silver Carp, "Flying Carp" *Hypophthalmichthys molitrix*		2-4 yrs/ 15-20 yrs	9 kg/ 1.2 m
Black Carp *Mylopharyngodon piceus*		6-11 yrs/ 15 yrs	Max 35 kg/ - 1.8 m
Grass Carp *Ctenopharyngodon idella*		1-10 yrs/ 5-11 yrs	2-14 kg/ 1.5 m
Common Carp *Cyprinus carpio*		15-20 yrs	2 to 14 kg

1.This information is largely extracted from www.asiancarp.ca . Further information, pictures and representations can be found there. 2. A source for purpose and finds was Becky Cudmore, from Fisheries and Oceans Canada/Pêches et Océans Canada. 3. Wikkipedia.Common Carp.4. www.great-lakes.net. Invasive carp.5. A source for findings: www.asiancarp.us

THERE IS NO DOUBT THAT ASIAN CARP ARE A REAL AND GENUINE THREAT TO THE GREAT LAKES, INCLUDING GEORGIAN BAY.

Finding and implementing effective measures to prevent this species from invading these waters will be especially complex and challenging given the many jurisdictions involved.

Understanding the state and complexities of the struggle and recognizing the different species and their dangers are critical if we are to prevent Asian carp from establishing themselves in the Great Lakes and Georgian Bay.

- Asian carp out-compete native fish for food, eating plankton and other food sources and grow quickly to large sizes.
- With no natural predators, they consume more food leaving less for other organisms whose numbers begin to dwindle.
- They compete with native fish for habitat, which changes once they're established.
- They prey upon native fish and could be carriers of diseases or parasites that can spread to native fish further decimating existing fish stock.

What are the potential economic impacts?

The Department of Fisheries and Oceans (DFO) Canada estimates that the socio-economic

The United States Army Corps of Engineers' (USACE) Great Lakes and Mississippi River Interbasin Study (GLMRIS) looked at various ways to prevent the two-way, interbasin transfer of "aquatic nuisance species"(ANS) or aquatic invasive species (AIS). The study focused on preventing 13 of some 254 ANS. Results of the study suggest that three Mississippi based species of carp, including the Scud, Silver carp, and Bighead carp, could transfer to the Great Lakes, and that 10 species currently in the Great Lakes pose a risk for the Mississippi River Basin.

IN THE GREAT LAKES

Diet	Finds in the Great Lakes	Key issues
Zooplankton - tiny drifting animal organisms, the basis of the aquatic food chain, organic debris, small invertebrates.	None	Able to eat up to 20% of their body weight each day. Lacks a true stomach, feeds continuously. Reduces food, shelter and spawning areas for native fish. Ability to cross breed with Silver Carp. No natural predators, so the food they consume is not available to other organisms.
Phytoplankton - tiny drifting plant organisms, the basis of the aquatic food chain.	None	Lacks a true stomach, so need to feed continuously. Reduces food, shelter and spawning areas for native fish. Ability to cross breed with Bighead Carp. Vibrations in water cause fish to jump up to 3 m (9ft) from water. Boat propellers can trigger. Hazard for water recreation. No natural predators, so the food they consume is not available to other organisms.
Young eat mostly zooplankton and later insect larvae and other organic debris. Adults eat mollusks.	None	Voracious appetites due to poor digestive system. Reduces food, shelter and spawning areas for native fish. No natural predators, so the food they consume is not available to other organisms.
Aquatic plants, but also organic debris, insects, small fish, earthworms, other invertebrates.	From 2013-2015, 3 triploid (can't reproduce) and 2 diploid (fertile male) carp found in Toronto area waters.	Able to eat up to 40% of their body weight each day. Reduces food, shelter and spawning areas for native fish. Break down approximately 1/2 plants they eat, the rest is discharged into the water - contributing to nutrient enrichment (threat of algal blooms).
Aquatic plants	Established all through the Great Lakes.	High reproductive rate. Foraging method creates murky cloudiness leading to disturbing and demolishing underwater vegetation. They expel significant undigested material which can lead to increased nutrient levels, which are linked to excessive algae development. They eat other fish eggs and can ruin their nests.

impact for Canada over 50 years would be $390 B[1] with the biggest impact being to recreational boating. From a cross-border perspective, the industries most likely to be effected by the invasion of Bighead and Silver carp are: recreational, sport and commercial fishing, shipping and tourism and recreation.

Asian carp in nearby watersheds — it only takes a few to wreak havoc

Evidence of the destructive nature of Asian carp in the Mississippi and Ohio River basins have heightened concern with their expanded numbers and increasing range. Havana, a small city along the Illinois River, has experienced the effect of Asian Carp on their environment. The first Asian carp was caught in the area in the early 90s. They now comprise 60% of all fish — severely limiting recreational activities[2].

> "Only 20 Asian carp are needed to establish a population in the Great Lakes.[3]"

While there have been sightings of Asian carp in the Great Lakes, including Lake Ontario, there is currently no evidence of a breeding or established population of the high risk Bighead or Silver carp. However, Asian carp are close so entry points to the Great Lakes need to be prioritized and protected.

[1] Socio-economic Impact· The Threat of Aquatic Invasives to the Great Lakes· Asiancarp·ca· Re-trieved from http://asiancarp·azurewebsites·net/WHAT-IS-AT-RISK/Socio-economic-Impact#

KEY PREVENTATIVE ACTIONS

1. THE CHICAGO AREA WATERWAYS SYSTEM (CAWS)

Entry to Lake Michigan via the CAWS and the Illinois River pose the greatest risk to a Great Lakes invasion. In 2012, Congress modified the focus of the GLMRIS study to 5 pathways in the CAWS, as they were determined to be the most likely entry point for ANS.

Asian carp in the CAWS, Lake Michigan and the Illinois River

- Within the CAWS, "…the adult population front of Bighead and Silver carp is 55 miles and two lock structures away from Lake Michigan," according to officials in 2014.[4]
- This "…overall leading edge…"[5] has not changed since 2006 and does not include spawning activity that happens further downstream in the Illinois River. Keeping this edge contained has required the ongoing poisoning of the waterway.
- Officials remain vigilant for Silver carp larvae, mapped further north then ever before on the Illinois River in June 2015.

Prevention

- **In use now - electrical barriers:** The primary defense structures currently being used in the Illinois River to prevent Asian carp from entering Lake Michigan are electromagnetic fields. Located north of Lockport Lock and Dam in the CAWS, the barriers are used in conjunction with other monitoring activities.
- Many view these electrical barriers as insufficient to prevent Asian carp from entering Lake Michigan.
- **In progress:** USACE Feasibility Study detailing ANS control strategies and establishing a one-way control point at Brandon Lock and Dam.
- The Brandon Road Study began in April 2015 and will take almost four years to complete at a cost of $8.2 M (USD). One-way means that ANS would be controlled going into the Great Lakes but not from the Great Lakes into the Mississippi.

WHAT IS THE CAWS?

The CAWS is a 128-mile system of mostly man-made canals and river channels in northeastern Illinois and northwestern Indiana and the only permanent and navigable hydrological link between the Mississippi River and the Great Lakes basins.

In its 2015 Framework, the Asian Carp Regional Coordinating Committee (ACRCC) said that the following steps will be taken to control migration:

- a new engineered channel in the approach to the Brandon Road Lock;
- the deployment of control technologies in the approach channel and lock structure and research into options, such as high pressure water (sound cannons), pheromones, and CO2 bubble screens, for reinforcing the lock to control ANS.[6]

If a one-way control point is established — and that will take time — it would be very effective in stopping Asian carp from entering Lake Michigan via the CAWS.

Long-term solutions in the CAWS:

USACE's GLMRIS report on the prevention of two-way transfer of ANS between basins, included four options involving complete hydrological separation of the basins. Here are a few key issues associated with these options:

- The cost could be as high as $18 B (USD), take 25 years to implement and radically alter the CAWS — the only navigable connection between the Great Lakes and the Mississippi Basin.
- The biggest opponent is the commercial shipping industry, which sends about 15 million tonnes of commodities through the waterways annually.
- Hydrological separation could cost the commercial cargo industry between $210 and $250 M (USD) annually.[7]

> "...the adult population front of Bighead and Silver carp is 55 miles and two lock structures away from Lake Michigan."

GBF talked to David A. Ullrich, the Executive Director of the Great Lakes and St. Lawrence Cities Initiative for his update on this issue from the CAWS Advisory Committee which he also sits on. The Committee includes representation from 30 public and private stakeholders as well as regional stakeholder groups. The Committee sent a letter to President Obama in January 2016 urging expedited work on an ANS lock or system that would provide protection comparable to physical separation in order to prevent two-way ANS transfer in the long-term.

According to Ullrich, many stakeholders maintain that full physical separation is the most effective way to stop the movement of invasive species in both directions. Others argue that this approach would interfere too much with transportation. The Advisory Committee, which has examined this issue since 2014, will continue meeting in the coming year.

To read a full update on the CAWS Advisory Committee's work, including its 2015 and 2016 letters to President Obama, please visit gbf.org/2016/03/24/asian-carp-caws-advisory-update/.

2. LAKE ERIE

A recent study suggests Lake Erie[8] is the most threatened ecosystem due to its higher variety of fish species compared to the other Great Lakes. Some argue that with less plankton, Lake Michigan and Lake Superior are less likely to support larger volumes of Asian carp. Alarmingly, officials have found evidence of Grass carp reproduction[9] in Lake Erie. While this type of Asian carp is thought to be less destructive than Bighead or Silver carp (because they eat plants instead of plankton), they are still voracious eaters that can harm wetlands and alter the environment for other fish. Currently, there is a bi-national risk assessment being conducted on Grass carp.

Prevention

Earthen Berm — the Eagle Marsh project 2015:
In Indiana, a two-mile earthen berm was erected across a floodway near Fort Wayne to prevent the connection of the Great Lakes and the Mississippi watershed during times of high precipitation or spring melt.

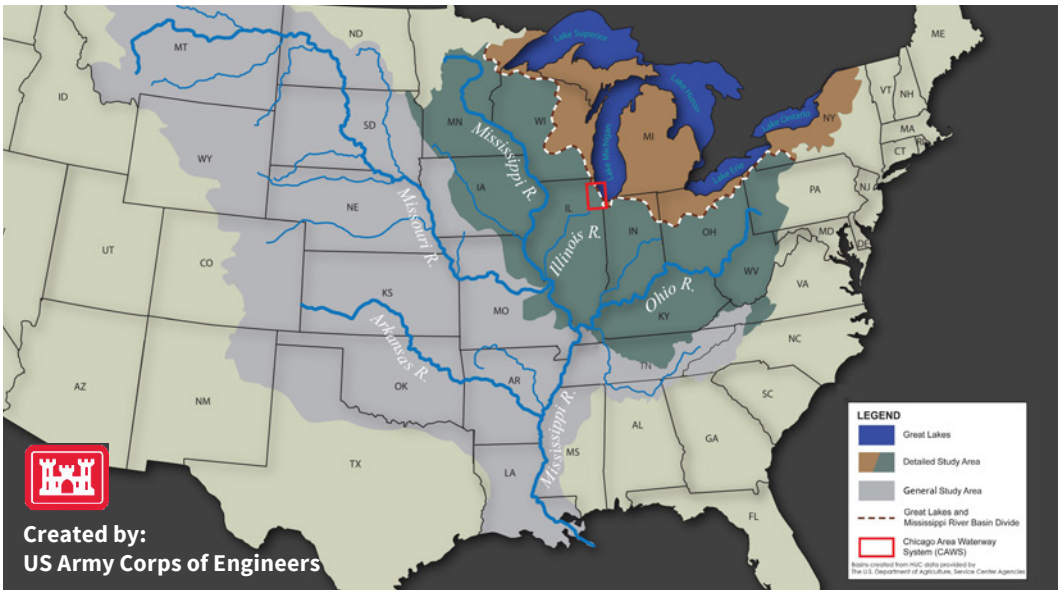
3. PREVENTING PEOPLE FROM BRINGING ASIAN CARP TO THE GREAT LAKES.

"All of the Great Lakes-U.S. states and the Province of Ontario have made it illegal to buy, sell, or possess live Asian carps."[10] Ontario strengthened its ability to prevent aquatic invasive species with the passing of Bill 37, the Invasive Species Act 2015, last October.

4. ASIAN CARP REGIONAL COORDINATING COMMITTEE

Credit is due to the many organizations that are at the frontline of prevention. Established in 2009, ACRCC oversees the many efforts of numerous stakeholders from federal, state/provincial governments, local agencies and private organizations. The Committee develops progressive approaches to Asian carp prevention in the Great Lakes beyond exclusive reliance on electrical barriers. Canada joined in 2013. In June 2015, it published the "Asian Carp Strategy Framework,"[11] a comprehensive summary of all major work being done to control Asian carp, including Bighead and Silver carp as well as Grass and Black carp.

We hope this article provides some insight into the complicated issues and strategies to prevent Asian carp from entering the Great Lakes. For more Asian Carp prevention efforts and details, please visit **gbf.org/stopping-asian-carp-great-lakes/**.



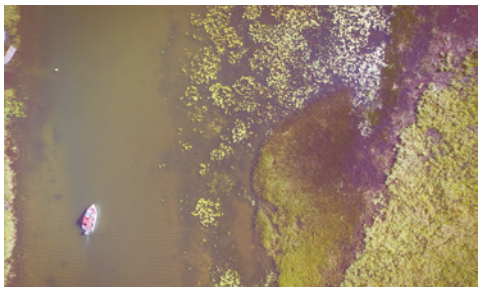
[2]Loo, Nancy and Grimes, Pam. (2014, October 13). This Illinois town has more Asian carp than any place else on earth [video file]. WGNtv article and video. Retrieved from http://wgntv.com/2014/10/13/ground-zero-for-asian-carp/; [3]Tiny Number of Asian Carp Could Be Big Problem for the Great Lakes. (2013). University of Waterloo. Retrieved from https://uwaterloo.ca/science/news/tiny-number-asian-carp-could-be-big-problem-great-lakes; [4]Asian Carp Control Strategy Framework. (June 2015). Page 6. Retrieved from http://asiancarp.us/documents/2015Framework.pdf; [5]Ibid. Page 7.; [6]Ibid. Page 21; [7]Aulakh, Raveena. "Meet Canada's Asian Carp Detective." Thestar.com. Sept 28, 2015.; [8]Asian Carp Could Forge Threat. LeaderCall.com (2016). Retrieved from http://leadercall.com/2016/01/asian-carp-could-forge-threat/; [9] Asian Carp Have Reproduced in Great Lakes Watershed. Associated Press (2013). Retrieved from http://www.cbc.ca/news/canada/windsor/asian-carp-have-reproduced-in-great-lakes-watershed-1.2286554; [10]Fisheries and Oceans Canada. Government of Canada. Retrieved from http://www.dfo-mpo.gc.ca/science/coe-cde/ceara/AIS-EAE/asian_carp-carpe_asiatique-eng.htm#whatdfoisdoing; [11]Asian Carp Control Strategy Framework. (June 2015). Retrieved from http://asiancarp.us/documents/2015Framework.pdf

UPDATE ON NATIVE FISH
WALLEYE, LAKE STURGEON & SUCKER FISH

Thanks to our donors, Georgian Bay Forever (GBF) continues to work on protecting wetlands, essential habitat for so many native fish, from invasive Phragmites and extreme water levels brought on by climate change. We also must do what we can to rehabilitate native fish populations in Georgian Bay. We need to understand the quality of these species' spawning areas for safe egg deposit so that informed decisions can be made by authorities on how to prioritize these areas for remedial action.

Last fall

Last fall, GBF reported that the Eastern Georgian Bay Stewardship Council (EGBSC) is working with a number of partners[1] including GBF to survey 8 to 10 tributaries within the Parry Sound District to help Walleye, Lake Sturgeon and Sucker Fish.These tributaries provide important spawning habitat for all species and critical refuge for juveniles.



Work began in 2015 on four Georgian Bay tributaries: Blackstone River, Seguin River, Shebeshekong River and Shawanaga River. Where conditions allowed, field work included taking spawning measurements, bathymetry mapping, aerial photos and fish sampling.

Why is this project important?

1. **Walleye** populations are dwindling.
2. **Lake Sturgeon** are listed as threatened by the Committee on the Status of Endangered Wildlife in Canada.
3. **Sucker fish**, although less desirable from a fishing standpoint, are declining for reasons that are less clear.

Destruction of habitat, climate change and over-fishing in the mid-1900s are some of the main reasons for the reported declines. Work needs to be done to support increasing these fish populations.

More work to come by March 21, 2018

Other tributaries to be assessed before the targeted project end of March 31, 2018, include Naiscoot River, Magnetawan River, Key River, Pickerel River, French River and Sucker's Creek. One spawning bed restoration will be designed and completed as the project comes to a close.

To read more on this EGBSC project, how GBF is helping, other partners and funding contributors, visit gbf.org/2016/03/21/fish-tributaries-help/.

Contributors:

Julia Sutton, EGBSC and Heather Sargeant, GBF

Left: Shebeshekong – aerial photos help identify potential fish habitat.
Below: Photographing spawning substrate

[1] Partners: Led by the **Eastern Georgian Bay Stewardship** Council, the group also includes Georgian Bay Forever, Georgian Bay Biosphere Reserve, Ministry of Natural Resources and Forestry, Upper Great Lakes Management Unit. This project is being funded through the Environmental Damages Fund for Parry Sound District and EGBSC. In-kind contributions for the project are being provided by GBF, GBBR, Upper Great Lakes Management Unit (UPGLMU) of Ontario Natural Resources and Forestry, and EGBSC.

GEORGIAN BAY – MAKING LASTING MEMORIES

> "My most treasured memories were made, and continue to be made, in this place where I feel the most alive."

Helen Roby Bryce has a passionate connection to the Bay as a fourth generation cottager. Her parents met at the cottage as did she and her husband! It all began at the turn of the 19th Century when the first Roby came to Pointe au Baril from Cleveland, Ohio, where Helen was born.

Helen's great grandfather and his friends purchased an island that they named Camp Cleveland and established one of the original camps that included cooks and servants brought up from Ohio. Helen's father told great stories about camp life, the system of bells, the meal fines for late arrivals to the table and the great joy he took in tormenting the cooks with stories of prowling bears and poisonous snakes. When Helen's parents married, they summered at her mother's cottage, where she grew up water-skiing behind her father's Century speedboat with her friends and watching tranquil sunsets from the huge porch overlooking Matthew's Bay.

Helen met her husband, Doug, at sailing classes at the Ojibway Club. When Doug and Helen married, they moved to Flatrock, his family's island, purchased in the early 60s. Today, Helen and Doug call The Chapel on Flatrock their family gathering place. Originally built as a functioning chapel by the previous owners — two Ministers — it was beautifully redesigned by her mother-in-law as the gathering place hosting two weddings and holding years of memories for the entire family.

This history is important to Helen, but it's the awesome power of nature, the clean cool air and water, the timeless granite highway and sharing the natural beauty of Georgian Bay with her loved ones that reignites a passion and deep appreciation for life each spring. "My most treasured memories were made, and continue to be made, in this place where I feel the most alive."

Helen is a tireless volunteer and gives back to her cottage community in many ways. Being a strong supporter of the Ojibway Club, she wants to help ensure its viability as a historical landmark and unique gathering place for generations to come. She is currently Secretary to the Ojibway Board of Directors, Director and Secretary to the Ojibway Historical Preservation Society, Coordinator of the annual Ojibway Art Show, Marketing Chair for the Pointe au Baril Islander's Association and a volunteer with Georgian Bay Forever's Communications Committee — but there is always time for tennis, entertaining and enjoying the timeless gifts of Georgian Bay!

Committed to protecting Georgian Bay for the next generations.

One of Helen's greatest joys is being together with her family and she feels immensely grateful to be watching the sixth generation — her three grandchildren — begin their lives on the Bay."This magical place, which means so much to all of us, must be protected so future generations can fall in love with it as we have, rather than just reading about how beautiful it once was." Helen continues to support the research sponsored by Georgian Bay Forever and is committed to helping to keep the waters of Georgian Bay drinkable, swimmable and fishable for many generations to come!

Thank you.

Georgian Bay Forever is truly grateful to Helen Bryce, her family and families like yours for the exceptional support of Georgian Bay Forever, enabling important projects and research that help protect the Bay. To learn more about how you can help, please visit our website at gbf.org.

GBF USES DNA PROFILING — WHO'S WHO IN THE WATER?

Georgian Bay is becoming an iconic example for Canada, and the globe, for the development of a rigorous scientific platform that will be able to measure human impacts on the ecosystem. Over the past five years, Georgian Bay Forever has been supporting research that creates a library of aquatic biodiversity using a DNA barcoding tool that can help us understand our complex ecosystem.

The huge number of species interacting in an ecosystem makes it tricky to understand or predict the human impacts on that system or area. DNA barcoding can both identify organisms and aid in uncovering full food webs. Once an ecosystem is catalogued, we can monitor the impact of ecosystem changes on diversity and even document hotspots in biodiversity that need protection as possible candidates for aquatic habitat preserves.

> "DNA barcoding helps us understand our complex ecosystem."

Since 2012, GBF has been working with Dr. Kevin McCann from the University of Guelph to create a DNA barcode catalogue for the Georgian Bay Archipelago food web. Through this partnership, we are improving our ability both to monitor the biodiversity of the ecosystem and to map its food web. It is this latter application of DNA barcoding that researchers like Dr. McCann can then use with other empirical inputs to produce ecosystem models. Those models will then be able to predict responses to major environmental impacts or management actions (e.g., Phoslock, climate change, development, invasive species or future aquatic preserves).

Our ongoing work in Georgian Bay and the Great Lakes is combining numerous biotracers (stable isotopes, fatty acids, etc.) and DNA techniques to monitor and inform the development of biodiversity policy both in Canada and globally.

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"THE BAYKEEPER" INDICATES THAT GEORGIAN BAY FOREVER IS A MEMBER OF THE WATERKEEPER ALLIANCE, A GLOBAL MOVEMENT OF ON-THE-WATER ADVOCATES WHO PATROL AND PROTECT OVER 100,000 MILES OF RIVERS, STREAMS AND COASTLINES IN NORTH AND SOUTH AMERICA, EUROPE, AUSTRALIA, ASIA AND AFRICA. FOR MORE INFORMATION GO TO WATERKEEPER.ORG

NOT IF WE CAN HELP IT.

Invasive Phragmites—a rapacious, invasive reed from Europe—has no natural controls. It spreads with spectacular speed and density, destroying shorelines, wetlands and whatever is in its path. Last summer, Georgian Bay Forever worked with more than 16 communities to control the growth of this pernicious invader. This year, we need your support to do even more. Find out how your donation will help safeguard Georgian Bay for future generations.

Visit GBF.org or call us at 905–880–4945.

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GEORGIAN BAY
FOREVER

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