NORTH SHORE
Steelhead
REPORT

A North Shore Steelhead Association Publication
Volume 19 - Spring 2023

Fifty Years of Conservation and Preservation

by Keith Ailey

If you have spent any amount of time fishing the rivers along Lake Superior's north shore, you have very likely seen the work of the North Shore Steelhead Association.

Since incorporation on January 13, 1973, the club has enhanced the quality of fishing on our waterways while also serving to educate the public about the importance of resource conservation in the rivers that feed Lake Superior.

The primary concern of the founding members was the protection and enhancement of the migratory rainbow trout (steelhead) fishery. Over the past five decades, their efforts have resulted in steelhead, as well as other species like pacific salmon and native brook trout, benefitting from conservation-focused projects on the tributaries these fish use in their annual spawning migrations.

The tributaries of Superior have had a naturalized, self-sustaining population of steelhead since the early 1900s, however, our rivers typically feature a steep gradient and they are full of barriers, both natural and man-made.

The NSSA has helped our steelhead populations in several ways, with the most noticeable being migration route improvement. Among the many NSSA projects that help migratory fish reach their spawning grounds are the installation of fish ladders and plunge pools below barriers, the elimination of perched culverts, and the addition of "steps" carved into the bedrock of natural waterfalls. Each of these help steelhead, salmon and brook trout navigate potential barriers under a variety of water conditions and not just in times of ideal flow levels.

In addition, habitat improvement and bank stabilization has benefitted the small juvenile rainbow trout that typically spend two years in the river before leaving for the big lake. Finally, and perhaps most importantly, the club has gathered scientific data to track population trends and spearhead changes to the fishing regulations, which revealed that the old harvest limit of five fish had kept populations from reaching their potential for far too long. This final step was the missing puzzle piece that led to the remarkable improvement in fishing we see on many rivers today. Most recently, the club has used social media as well as riverside signage to educate the public about the importance of keeping our rivers clean and the benefits of releasing our steelhead to fight again another day.

The quality of steelhead fishing around Thunder Bay is vastly improved thanks to the efforts of the NSSA

Frank Edgson, the club's treasurer says "in my opinion, the greatest accomplishment of the NSSA has been in regards to our education of the angling community as well as the general public towards catch & release and in keeping our streams clean of litter." Looking to the future, he says continued work to improve the migration corridor on the Current River is a priority, and this spring, we will see the installation of fishing line collection units from Clear your Gear on local streams. These units will provide anglers an environmentally friendly option to properly dispose of their old monofilament fishing line.

Club president Tom Whalley was introduced to the NSSA at a youth fishing clinic 37 years ago. He echoes Edgson's thoughts on the shift in focus by local anglers towards releasing their catch, saying that people now recognize the value of our steelhead as a sport fish as opposed to the old attitude of fishing for the purpose of harvest.

It is this change in attitude, and the widespread adoption of proper fish handling techniques before safely releasing steelhead, that has seen populations rebound on our most heavily pressured rivers. Terry Kosolowski, the club's vice president and a member since its inception, says this has been made possible because of partnerships. "Over the years we have developed relationships with the scientific community, and governmental agencies, and have been able to secure approvals, funds and even the labour to get vital conservation projects done."

The results of the NSSA's efforts are obvious to anyone fishing our rivers today. As Kosolowski says, "we've definitely changed the fishing game. The result is that we now have one of the best self-sustaining rainbow trout fisheries on the great lakes."

Looking back, it is satisfying to see how the NSSA have worked to improve habitat and migration routes, as well as the angling regulations for steelhead. Thanks to the North Shore Steelhead Association, the prospect of catching a steelhead is now a reality for more people than ever before.

Keith Ailey is a Visual Arts teacher at Superior Collegiate & Vocational Institute where he volunteers his time with the Outdoors Club and Travel Club as well as the cycling, skiing and XC running teams.

CLEAR YOUR GEAR.ca

It catches more than fish

The NSSA in cooperation with Clear Your Gear will be setting up monofilament line collection stations on several local streams this spring.

Volunteers from the NSSA will install and maintain Recycling Receptacles at convenient drop off locations on local rivers (McIntyre, Neebing, Current and McVicar Creek). Other units will be installed at the Lakehead Conservation Region Authority properties as well as several City owned boat launches for the general public to discard their fishing line properly.

Clear Your Gear is Canada's volunteer fishing line recycling network. We make our volunteer-built fishing line recycling receptacles available to individuals, community groups, and retailers for FREE.

Most fishing line is non-biodegradable and can last hundreds of years depending on environmental conditions. Much of the discarded fishing line in the water gets there when someone's hook gets snagged on something underwater and the line breaks when pulled. Sometimes the line will become snagged or rub against a sharp rock and will break. Large fish can pull hard enough to break lines. Sometimes fishing lines get caught in trees and break off. Even fishing line that is thrown in the garbage can end up in the environment — either by blowing out of the garbage can or landfill, or by being taken out by birds or animals.

The fishing line is collected from recycling bins and cleaned of hooks, leaders, weights, and trash by volunteers. It is then shipped to the Berkley Pure Fishing company in Iowa. Berkley melts the line down into raw plastic pellets that can be made into other plastic products including tackle boxes, spools for line, fish habitats, and toys.

The only fishing type of fishing line that can be recycled is a single filament nylon product (such as monofilament and fluorocarbon). Fishing line that is braided or contains wire cannot be recycled. Fishing line that has a lot of growth on it or plant material mixed up with it may not be recycled as well. Cut this fishing line up in small pieces (less than 12 inches) and place in a covered trash bin to make sure the line is disposed of properly.

Modifications and Fish counters for the Fishway at Boulevard Lake

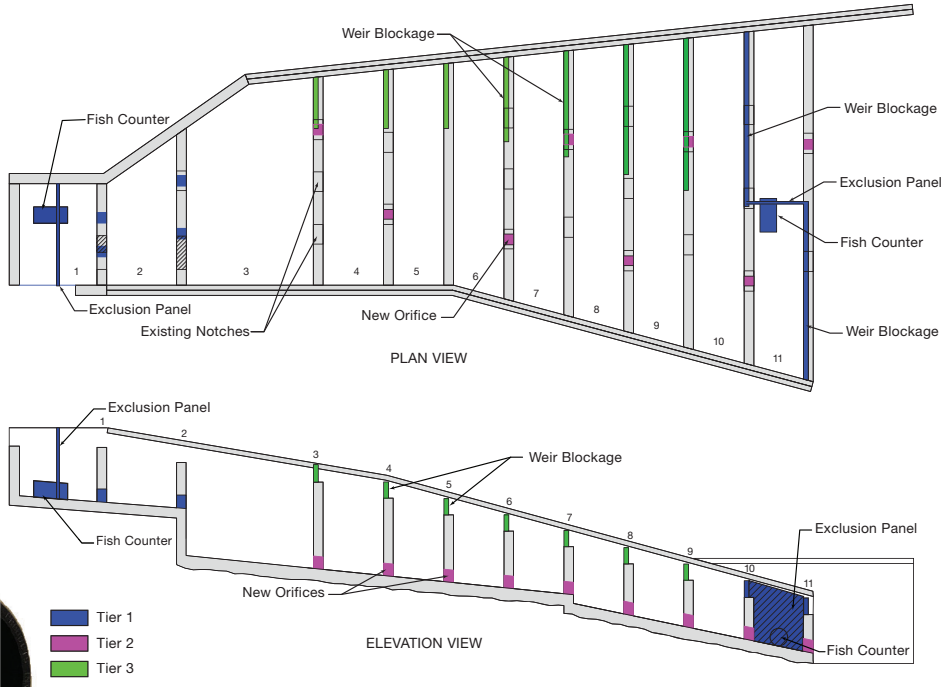
This project is ongoing, moving slowly but forward

In 2020 the NSSA made the decision to invest time and money to learn more about the fishway. Successful applications to Environment and Climate Change Canada provided funding assistance to hire consultants to evaluate the fishway for the determination of the optimum water requirements, and to review the actual physical structure with the idea of potential improvements. Subsequently the consultant's assessment indicated several minor modifications to the concrete which could be made to both facilitate the installation of fish sensors and improve fish passage.

While the goal was to have the modifications and counters installed for the 2023 spring run, we are now attempting to be ready for the fall run.

The City of Thunder Bay provided funding up to $27,000.00 for the completion of the stamped engineer drawings by JML Engineering. These drawings were used to develop a tender package for the each of the tiers of the project. The package was sent to a selected number of construction firms in early January. Unfortunately, the tenders were all well above our expectations, and we are now in the process of reviewing the scope, potential cost savings and the availability of additional funding partners.

We have an application submitted to Environment and Climate Change Canada's Great Lakes Protection Initiative fund requesting $85,000.00 (modifications to the concrete structure) to add to the NSSA's funding of $61,900.00 (includes fish counters and installation costs). An additional $176,000.00 is required for this project to be fully funded. The NSSA will apply to the CEDC for tourism dollars, and attempt to convince the COTB to apply for funds through the Northern Ontario Heritage Fund Corporation (NOHFC).The project time frame for completion is August 2023 if the funding is in place, and approvals have been received from the LRCA and MNDMNRF. This project may have to be delayed yet another year to ensure funding is secured. We should know our direction by May of this year.



New Fundraiser!

The NSSA is endeavoring to raise funds by means of an online Raffle and 50/50 draw. Funds from this effort will be directed to assist the NSSA with habitat improvement projects and other objectives approved by the iAGCO.

This is your opportunity to win a package consisting of 2 Polaris 450 ATVs and a trailer. Tickets will be available online to those over the age of 18 and are residents of Ontario.

The ATV package draw will run from April 1 to July 1, 2023.

There is also the opportunity to purchase a 50/50 ticket available.

Tickets will be available through Rafflebox https://www.rafflebox.ca/raffle/nssa

Draw Date - June 30, 2023

The Status of Wild Steelhead Populations in Ontario Waters of Western Lake Superior (2022)

by Jon George

A healthy wild steelhead population in Ontario waters of Lake Superior exhibits a wide variety of life history characteristics (number of stream and lake years, age at maturity, migration patterns and spawning time) plus maintains a repeat spawning rate of > 50% over one generation (four years). This enables individual tributary populations to maximize recruitment of juveniles and maintain the integrity of localized adaptations.

The "Swanson Index" uses the repeat spawning rate to index the annual mortality and angler harvest rate from an adult steelhead population. For example, a 50% repeat spawning rate (survival rate) equals a 50% total mortality rate. Annual natural mortality in Lake Superior has been calculated at 30%; therefore, fishing mortality in this example would be 20%. It is recommended that Lake Superior fisheries managers maintain harvest levels at or below 20%. (Swanson 1885, Clarkson and Jones 1997)

Applying Swanson's repeat spawning index to the ten tributaries listed in Table 1, most populations achieve the acceptable harvest levels. The exception being small tributaries on Lake Shore Drive.

Thunder Bay tributaries (Neebing, McIntyre and McVicar) not only have low harvest, but an estimated adult steelhead population size greater than 2000. (Table 1) This is mainly the result of large numbers of repeat spawners and excellent survival of the stream dwelling juvenile year classes in 2015, 2016 and 2017. Small Lake Shore Drive creeks ie. Blind Creek had a high annual mortality but are maintained by strong showing of first time spawners.

Nipigon Bay tributaries were represented by the Jackpine, Cypress and Big Gravel Rivers. These adult steelhead populations had a high repeat spawning rate over the past four years indicating low natural and fishing mortality. The combination of sufficient annual recruitment of juveniles (2015 to 2018) and high survival of older adults indicates healthy steelhead populations.

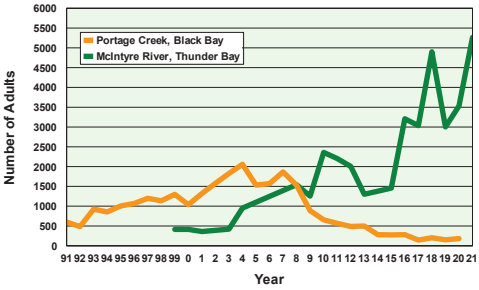
Table 1. Repeat spawning, mortality and population size

Tributary	Repeat Spawning *	Total Mortality	Harvest Rate †	Population Size ‡
Whitefish R. (Thunder Bay)	58%	42%	12%	
Neebing R. (Thunder Bay)	66%	34%	4%	2133 +- 1169
McIntyre R. (Thunder Bay)	68%	32%	2%	5263 +- 2513
McVicar Cr. (Thunder Bay)	59%	41%	11%	2184 (2020)
Lake Shore Drive tribs. (Thunder Bay)	43%	57%	27%	
MacKenzie River (Thunder Bay)	56%	44%	14%	328 +- 178
Portage Cr. (Black Bay)	60%	40%	10%	182 (2021)
Jackpine R. (Nipigon Bay)	72%	28%	N/A	
Cypress R. (Nipigon Bay)	68%	32%	2%	1600 (2016)
Big Gravel R. (Nipigon Bay)	63%	37%	7%	

** Four year average (2019 -2022)*
† Based on 30% natural mortality (Swanson 1985)
‡ 2021 adult spawning population size is based on 2022 recaptures (Petersen estimate)

Steelhead Population Comparison

Adult Population Size 1991 to 2022



Black Bay tributaries (Wolf R., Coldwater R., Black Sturgeon R. and Portage Cr.) express high repeat spawning rates, but have poor recruitment of juveniles. Figure 1 illustrates the contrast in population size between Thunder Bay and Black Bay using the McIntyre River (Thunder Bay) and Portage Creek (Black Bay) as "Index Streams". Portage Creek representing Black Bay has seen a 90% decline of adult steelhead over the past twelve years, whereas the McIntyre River has had a dramatic increase in its population size over the same period. Changes in the Black Bay predator/prey relationships since 2004 is likely responsible for the decline of the adult steelhead abundance in tributary streams.

Literature Cited

Clarkson, J. and M.L. Jones.1997. A method to estimate an Index of Mortality based on proportion of repeat spawners in rainbow trout (Oncorhynchus mykiss) population.

Swanson, B. 1985. Pikes Creek/Lake Superior: population dynamics, fishery and management alternatives. Wisconsin DNR. Management Report 125, 29p.

Two 2022 Polaris Sportsman 450 ATVs with a 2022 Marlon RAT-02 Trailer **Total Prize Value $24,452.40**

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Invasive Phragmites

by Michelle Willows

Invasive Phragmites are a significant threat to wetlands, shorelines, and other sensitive habitats. Forming dense monocultures, Invasive Phragmites reduce the availability of food and nesting sites for many species. The rooting systems decrease soil nutrients and are known to release a toxin, hindering the growth of new species and eliminating surrounding native plants. Aggressive by nature, this species has been damaging ecosystems by out-competing native plants and animals, effectively reducing shoreline biodiversity.

The rapidly growing perennial grass can alter water levels, reducing the amount of open water in wetlands, and blocking access to waterways. Not only do Invasive Phragmites influence ecosystem function but recreational activities such as hunting, fishing, boating, and swimming become impacted. Shocking photos of the well-established stands being managed in Southern Ontario provide a good incentive for addressing Phragmites in Northwestern Ontario while it's in the earlier stages of establishment.

Funded by the Invasive Species Centre, the Lakehead Region Conservation Authority is initiating the Thunder Bay Regional Phragmites Collaborative with the vision of being "Phrag Free by 2033". The formation of a Working Group will allow community members to combine resources, knowledge, and enthusiasm to effectively manage Invasive Phragmites in the region. For more information contact stewardship@lakeheadca.com.

Don't forget to report suspected observations of invasive Phragmites on EDDmaps or to the Lakehead Region Conservation Authority!

Michelle Willows, MEs Northern Environments and Cultures
Environmental Planner
Lakehead Region Conservation Authority

Catch and Release

Catch and release is a critical component in maintaining self-sustaining wild Steelhead populations. Steelhead are a fairly aggressive species which makes them a popular target amongst anglers, especially during the spawning migrations. Unfortunately, their willingness to bite increases the potential to be harvested by anglers. This issue is further amplified by the fact that Lake Superior and its tributaries are cold and sterile environments which limits the number of fish that they can produce and sustain. Despite these challenges, many tributaries along the North Shore are seeing Steelhead populations at or near their peaks since monitoring began.

Even with increasing angling pressure, many of the major tributaries that flow into Thunder Bay are currently supporting the largest Steelhead populations they've had in decades - and possibly ever. How can it be that on many tributaries we are currently experiencing increasing Steelhead numbers while the number of anglers also increases? An important contributing factor is the prevalence of catch and release. Steelhead tagging data has shown that catch and release works. Each year there are a few tagged Steelhead that are caught and released multiple times by anglers, some Steelhead have been reported being caught up to 6 times in a single spring! The first benefit of catch and release is that multiple anglers can experience the joy of catching that fish, something that would not be possible if that fish was harvested the first time it was caught.

A second benefit of catch and release is that the fish will have a chance to spawn and contribute to future Steelhead generations, and not only once, but up to 8 times! While there's nothing wrong with harvesting the odd Steelhead, the continued success of our Steelhead fishery really relies on anglers to release most of their catch. Environmental conditions are another important factor that influence Steelhead population sizes. In recent years, those conditions have been largely favourable for Steelhead, but this may not always be the case and the Steelhead populations may be reduced as a natural response. As anglers we cannot control the environmental factors, but each angler can control how many Steelhead they chose to harvest.

The next time you're landing a nice chrome Steelhead please remember, the future of sustainable Steelhead fishing along the North Shore of Lake Superior is quite literally in your hands.

Join The NSSA! Membership is Free

The North Shore Steelhead Association (NSSA) was formed on January 13, 1973, as a non-profit organization concerned with the conservation and preservation of fisheries in the tributaries of Lake Superior.

NSSA's primary mission is the protection and enhancement of the North Shore migratory Rainbow Trout (Steelhead) fishery, however this has evolved to include all coldwater species of the Lake Superior Watershed.

The NSSA's constitution stresses public education and close collaboration with authoritative bodies (M.N.R.F., L.R.C.A., and North Shore Community Councils) as strategies for conservation.

Our financial base is developed exclusively from fundraising and donations from supporters. These activities not only generate capital for our projects, they also heighten public awareness of the need for environmental protection of Lake Superior's North Shore.

The objects of the NSSA are:the conservation and preservation of the coldwater fisheries of Lake Superior and Lake Superior watershed (Ontario). This includes activities and programs that promote and achieve environmental preservation and enhancement, such as:

- Lake and stream rehabilitation
- fish habitat restoration and enhancement
- activities to combat invasive species
- data collection and analyses (including genetic, DNA, tissue, cell, molecular)
- fish population monitoring (sampling, aging, tagging, counting), restoration, and
- associated scientific research for the purpose of understanding and enhancing fish populations and habitat.

The NSSA also engages in awareness campaigns, programs, and signage consistent with, and for the purposes of pursuing, its objects.

The NSSA may from time to time make donations to other organizations whose activities are consistent with and beneficial to the NSSA's Objects.

Sign up at www.northshoresteelhead.com

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@northshoresteelhead

NORTH SHORE Steelhead ASSOCIATION

North Shore Steelhead Report is a publication of the North Shore Steelhead Association
Graphic Design • Jay Rutland
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