



29 April 2019

Prepared by the New Brunswick Invasive Species Council for submission to the House of Commons Standing Committee on Fisheries and Oceans' National Aquatic Invasive Species (AIS) program

Summary

Like other coastal jurisdictions, AIS concerns in New Brunswick are focused on both the coastal/marine ecosystems and the freshwater ecosystems. Numerous AIS are already present in the province, and there are many poised to invade from nearby jurisdictions. There has been no coordinated efforts to address pathways of introduction and spread of AIS in New Brunswick, there is no coordinated monitoring for early detection of AIS in freshwater ecosystems, and there are no plans or funding in place to implement rapid response when new AIS are identified in the province. The introduction of Small Mouth Bass in the Miramichi River watershed (see appendix) illustrates the need for coordination, leadership and rapid response to AIS in NB.

The New Brunswick Invasive Species Council (NBISC) formed in 2009 with support from the Invasive Alien Species Partnership Program. This federal program built capacity in the province to address AIS, but since the end of the program there has been no funding available for coordinating activities related to AIS. This lack of funding and coordination is putting New Brunswick habitats, as well as commercial and recreational fisheries and aquaculture, tourism, and riparian property values, at risk.

AIS concerns in New Brunswick's coastal and marine ecosystems

- There are thousands of kilometres of coastline in New Brunswick, stretching between the Gulf of St. Lawrence and the Bay of Fundy and supporting economic and tourism sectors under threat from AIS.
- The NB Shellfish Aquaculture sector and to some degree the commercial shellfish fishery have been significantly impacted by Aquatic Invasive Species (AIS) since 1998. There have been significant changes to fish habitat and impacts on wild species as a result of invasive species and their negative impact on biodiversity and habitat.
- The species that are most detrimental are the Clubbed Tunicate (*Styela clava*), Vase Tunicate (*Ciona intestinalis*), Golden Star Tunicate (*Botryllus schlosseri*) and Violet Tunicate (*Botrylloides violaceus*). The Green Crab (*Carcinus maenas*) has impacted clam populations and its impact on eel grass beds is still being investigated. The Oyster Thief (*Codium fragile*) has had lesser impacts on commercial and aquaculture oyster beds. One such species that is present in the State of Maine and has been found in the Bay of Fundy is the Pancake Batter Tunicate (*Didemum vexillum*), an aggressive growing colonial tunicate.
- DFO Science has been monitoring for the presence of AIS around NB and throughout the Southern Gulf of St Lawrence to monitor the movement of the species that are present and for any new invaders that we are watching for.
- Through a DFO licencing process, the industry and the provincial government have been engaged in restricting shellfish movements around and into NB to help prevent the further spread of AIS. We have been successful but we are only controlling one vector while many others exist. The new AIS regulation under the Fisheries Act may help address other vectors.

AIS concerns in New Brunswick's freshwater ecosystems

- New Brunswick is the only one of Canada's three Maritime Provinces physically connected to continental North America and its western international Border with the State of Maine, USA and its north-western border with the Province of Quebec represents an important entry points for AIS to

Atlantic Canada. New Brunswick contains approximately 60,000 kilometres of rivers and streams, and 2,500 lakes and ponds, representing approximately 1,460 square kilometres of surface water. All are currently threatened from AIS.

- Invasive freshwater fish of concern to New Brunswick
 - Chain pickerel (*Esox niger*) and Muskellunge (*Esox masquinongy*) are widely distributed across the province.
 - Rainbow trout (*Oncorhynchus mykiss*), Walleye (*Sander vitreus*), Largemouth Bass (*Micropterus salmoides*) and Smallmouth Bass (*Micropterus dolomieu*) have been illegally introduced to some of New Brunswick's waterbodies and rapid efforts are needed to reverse these introductions or reverse or reduce their further spread. See Appendix A.
 - Pike (*Esox lucius*) and Asian Carp (*Cyprinus* spp; *Hypophthalmichthys* spp;) are Invasive fish where prevention efforts are necessary and where DFO's AIS regulation could provide assistance.
- Invasive aquatic plants
 - Since its 2016 discovery, Eurasian Water Milfoil (*Myriophyllum spicatum*) is considered to be established in the Saint John River overtaking rare flora, degrading fish habitat, and threatening to spread to New Brunswick's other water bodies.
 - Other species of concern are Water Chestnut (*Trapa natans*), Water Soldier (*Stratiotes aloides*), Curly Pondweed (*Potamogeton crispus*)
- Invasive Zebra (*Dreissena polymorpha*) and Quagga Mussels (*Dreissena bugensis*)
 - Invasive mussels have been identified as a threat to two Federally listed mussel species: Brook Floater (*Alasmidonta varicosa*) and the Yellow Lampmussel (*Lampsilis cariosa*).
 - Based on direct impacts freshwater mussel species in other Canadian jurisdictions, invasive mussels are also considered a direct threat to the 8 other native mussel species in New Brunswick, not currently listed.
 - DFO's AIS regulation provides a regulatory tool to prevent the introduction and establishment of Zebra Mussel in New Brunswick's, and subsequently Atlantic Canadian, waterways.
- DFO has constitutional responsibility for the conservation and management of fish and fisheries in marine and inland waters. In NB, by virtue of an MOU, ERD has management responsibility for the recreational fishery of 19 inland species.
- In 2015, DFO, in collaboration with provinces and territories, developed the Aquatic Invasive Species Regulations. The Regulations prohibit the import, possession, transport and release of significant risk species, in specific geographic areas and under specific conditions. The Regulations also include a general prohibition against the unauthorized introduction of aquatic species where they are non-indigenous. What is lacking is the ability for conservation officers to lay charges when a naturalized invasive species (e.g. Smallmouth Bass on the Saint John River) is found being transported to another area of the province.
- Recognizing that DFO has engaged with Provincial and Territorial representatives to share knowledge, the following are some actions DFO needs to take to address threats to New Brunswick's inland waters from AIS:
 - Ensure coordinated efforts by federal, provincial/ territorial, and NGOs to prevent, detect, and response of AIS regionally. Take a leadership role in the transmission of knowledge through sharing prevention, early detection, and rapid response lessons learned and protocols developed nationally and internally across Canada.
 - Allocation of funding to support prevention and Early detection, rapid response initiative
 - Work with Provincial and territorial jurisdictions to enable the implementation of the AIS regulations by working with jurisdictional conservation offices and by engaging with other environmental regulatory processes to include AIS concerned (e.g. Environmental Impact assessment).

A Recent Example of Ineffective Action To Address an Invasive Freshwater Fish Species in NB

In what follows, this document describes an on-going threat posed by an invasive fish species in New Brunswick. The example focuses on the illegal introduction of smallmouth bass into Miramichi Lake, NB and briefly summarizes activities undertaken in the past 10 years to address the situation. In many cases, legislation, regulations, policies and strategies already exist in Canada to combat invasive species but they have not always been adequately used.

For the sake of brevity this section will not focus on the UN Convention on Biological Diversity, the Canadian Biodiversity Strategy, the FPT approved blueprint to deal with the threat of invasive alien species, the CCFAM Aquatic Invasive Species Task Group's aquatic invasive species action plan, National Code on Introductions and Transfers of Aquatic Organisms, Invasive Alien Species Strategy for Canada, or the Aquatic Invasive Species Regulations.

It is time for DFO to address threats posed by invasive species by taking a leadership role and immediately deal with them when they are discovered. Effective control measures can be undertaken at the same time as Implementation Plans are being finalized.

LOCATION, BACKGROUND AND THREAT

- Miramichi Lake is located in central New Brunswick in the upper reaches of the Southwest Miramichi River watershed, approximately 20 km south-east of the village of Juniper.
- Illegally introduced, non-native smallmouth bass (SMB) were discovered in Miramichi Lake in 2008 and is the first and only known occurrence of this species in the Miramichi watershed
- In the absence of leadership from DFO, a Working Group for the Eradication of Smallmouth Bass from Miramichi Lake was formed.
- The Working Group includes two Indigenous and five Conservation Organizations including: the North Shore Micmac District Council Inc., the Maliseet Nation Conservation Council, the Atlantic Salmon Federation, the Miramichi Salmon Association, the Miramichi Watershed Management Committee, the New Brunswick Salmon Council and the New Brunswick Wildlife Federation
- The inevitable spread and downstream colonization of SMB pose a significant risk to the entire Miramichi ecosystem which supports its iconic Atlantic salmon populations that provide fish for First Nations Food, Social, and Ceremonial fisheries and for an important recreational fishery.

DFO'S PLAN

- In 2009, DFO adopted a "contain and reduce" plan by installing two barrier fences near the outlet of Miramichi Lake, operated seasonally each year after ice-out (May through October).
- Complete containment is impossible given that the barriers may become permeable to young-of-the-year SMB for short periods due to maintenance for debris removal, fluctuating water levels and complete removal of the fences during the winter months.
- In addition to containment operations, SMB were also captured and removed by electrofishing and netting
- All life-history stages of SMB continue to be caught annually in the lake
- DFO's plan to "contain and reduce" will never eradicate the invasive species.
- DFO's program costs ~\$80-120 K per year and totals ~\$1 M to date.
- Although piscicides were being used in other Canadian Provinces and had been successfully used in NB with DFO permission in the early 2000s, until 2015 DFO would not consider eradication using a deleterious

substance in this Province, since they considered it to be technically impossible and would require legislation changes.

- DFO's failure to quickly and effectively eradicate the threat posed by this invasive species heightens the threat of irreversible, negative effects on all native freshwater species in the watershed.

THE WORKING GROUP'S PLAN

- The Working Group informed the DFO Minister-of-the-day, Hon. Dominic LeBlanc and his staff on numerous occasions of their concern that a lack of decisive action from DFO poses a clear and present danger to the biodiversity, character, and species composition of the Miramichi River.
- The working group committed significant time and financial resources to identifying a successful resolution to the risk posed by SMB.
- With full prior knowledge and encouragement from DFO, the Working Group hired, at a cost to the Working Group of \$30,000, two international experts on aquatic invasive species to study the situation and develop a clear plan for the eradication of smallmouth bass from Miramichi Lake.
- The report recommends a safe, feasible, practical, and legal plan for the complete removal of SMB and restoration of the lake's ecosystem.
- Of the methods evaluated for eradicating SMB, the use of rotenone is the only practical solution.
- Other evaluated options include: 1) Physical removal, 2) Biological Control, 3) Genetic Manipulation, 4) Dewatering and 5) Explosives.
- Indigenous communities in South America traditionally use this plant-derived compound to harvest fish for food.
- Eradication by rotenone is the most commonly used and most successful technique for aquatic invasive species control in the world and is routinely used in the United States, Canada and Europe.
- On 4 April 2019, the North Shore Micmac District Council, in partnership with the other members of the Working Group, submitted an application to DFO to authorize the deposit of a deleterious substance (rotenone) pursuant to the Aquatic Invasive Species Regulations

CURRENT STATUS AND CONCLUSION

- The Working Group continues to be disappointed with the lack of leadership from DFO on this critical matter.
- Experts from around the world favour decisive and immediate action to eliminate invasive species before they spread. DFO should have embraced this tactic in the early stages of the discovery.
- The federal, provincial and territorial governments together bear overall responsibility, but particularly DFO as the agent for the Government of Canada, to immediately implementing a strategic approach to address the risks associated with this invasive species.
- DFO's lack of leadership was confirmed in a letter from former Minister LeBlanc to the Working group on 5 July 2018 that states "*The Department's preferred approach is to continue to use physical control techniques in collaboration with you, other members of the working group, and the province of New Brunswick. DFO will not be a proponent for a chemical eradication project in Miramichi Lake and will remain **solely as a regulator** for such a project*".
- The Working Group accepts that partnerships with industry, Indigenous peoples, NGOs and all other stakeholders are imperative for its success.
- DFO should be more open, transparent and cooperative with the Provincial Government in addressing the threat
- Unfortunately, DFO's lack of leadership has resulted in the NGO Working Group assuming a leadership role, the tasks of which include the funding of the expert report and initiating all discussions and meetings with DFO.
- It is recognized that eradicating SMB using rotenone is a remediation measure that will have a temporary

impact on the lake's fish populations. The duration of the effects are minimal in comparison with the permanent effects of SMB on the entire Miramichi ecosystem. Chemical reclamation is the only option that will eliminate the risk of the invasive fish establishing beyond its current range in the Miramichi watershed

NOTE: In addition to this critical example of the smallmouth bass situation in the Miramichi watershed, several other invasive fish species of-concern on a province-wide bases include: chain pickerel, largemouth bass, wall-eye, muskellunge and numerous cyprinids (used as bait in the recreational fishery).



Appendix A Prepared for the NB Invasive Species Council by the New Brunswick Salmon Council for submission to the House of Commons Standing Committee on Fisheries and Oceans' national Aquatic Invasive Species program

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