Invasion of Smallmouth Bass in Miramichi Lake

Compiled by the New Brunswick Wildlife Federation
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An invasive introduction of smallmouth bass in Miramichi Lake was discovered in the fall of 2008. These fish, if allowed to escape the lake into the Main Southwest Miramichi, will spread throughout the watershed and could cause untold and irreparable harm to the existing Atlantic salmon and trout populations. Miramichi Lake is a fairly large lake (221 ha.) located close to the headwaters of the Main Southwest Miramichi River near Juniper, N. B.

NBWF has closely monitored the action that government agencies have taken to deal with this threat to the world's greatest Atlantic salmon river system.

The current government plan is to contain the bass to the lake, with a barrier at the outlet and to remove the lakes bass population, using electrofishing techniques, plus gillnetting and fykenetting. We believe that this plan will not work, because it cannot work.

To support our contention that the government plan will prove ineffective (and possibly a dangerous gamble) we have, with the help of others, assembled a body of opinion from fishery professionals and knowledgeable people.

What follows is a collection of selected and partial quotations and phrases from various sources. In the interest of brevity, we have not included entire documents, which are available upon request.

David P. Boucher, Maine Department of Inland Fisheries and Wildlife, December 2009:
"Raft electrofishing proved to be an efficient means of removing large numbers of bass from C Pond over a two-year period. However, young-of-year and yearling bass remained abundant, indicating that some adult bass survived to spawn successfully despite intensive removal work. We concluded that complete eradication of smallmouth bass from C Pond using electrofishing techniques is not feasible, and that this effort should be abandoned".

Roland Michaud, President, NBWF, Press Release January 19, 2009:
" …. The only real answer is to treat the lake with rotenone"

Canadian Wildlife Federation to R. Michaud, February, 2009:
"Cost of rotenone for Miramichi Lake could be $600 K to $1 million".

James Irving, President, J. D. Irving Limited, 2009:
"For the protection of the Miramichi River's historical and valuable wild Atlantic salmon fishery, the invasive Smallmouth bass must be completely eradicated using the most effective methods."

R. Allen Curry, Ph.D., Canadian Rivers Institute, 2009:
" … And begin an eradication program in the lake. The latter will involve netting, angling and perhaps the use of chemicals to kill the species in the lake. Chemical eradication will eliminate all fishes and blocking the lake may impact other migratory species using the lake, but that is an acceptable risk for the ecosystem and exemplifies the severity of impact we anticipate from smallmouth bass becoming established in the Miramichi River. It is critical that we act now; i.e., spring, 2009 before it is too late, and we lose the river to an illegally-introduced invader."

F. Whoriskey, VP Research & Environment, Atlantic Salmon Federation, April 15, 2009:
"The only way to eliminate the risks posed by this exotic to the salmon is to eradicate it".

Brian Finlayson, California Department of Fish and Game, Pesticide Investigation Unit, November 26, 2009:
" …… If everything is done correctly, there is close to a 100% success of eradicating SMB from Miramichi Lake. I would probably treat around October 1 during minimum lake volume and maximum temperature after the thermocline disappears.

Several things to consider:
1. Although using liquid is the easiest to use, the main body of Miramichi Lake could easy be treated with powder since it is so shallow. The inlets and Lake Brook with still be treated with liquid. Advantages include: (1) not having to worry about persistence of the other chemicals in the liquid formulations, some of which (diethylene glycol ethyl ether and fennedefo 99 in CFT Legumine) persist 30 to 60 days beyond rotenone in cold water, and (2) the chemical cost would likely be cut in half. The downside is getting more specialized equipment to apply the powder, and the powder is more of an applicator hazard.
2. You will want to use the rotenone powder/gelatin/and mixture to treat seeps and springs. This is a minor consideration."

John Clarke quoting John Odenkirk, District Fisheries Biologist, Virginia Department of Game and Inland Fisheries, February 6, 2010:
"I do not believe that any species of fish can be eradicated from any body of water (maybe besides a puddle) with electrofishing. An attempt to eradicate SMB from a large lake with EF is ludicrous. Rotenone would be a better gear for this, but the dose would have to be high and probably repeated for a complete kill."

John Odenkirk, District Fisheries Biologist, Virginia Department of Game and Inland Fisheries, February 8, 2010:
" …. As I have stated, the idea that they can eradicate SMB (or any fish population for that matter) from a 221-ha lake using EF is simply unrealistic. By taking our study (depletion sampling of SMB in rivers) and applying the capture probabilities to depleting a population from a lake, Reid et al. have over simplified and taken our results "out of context" for the much more difficult task of depleting (not eradicating) SMB with one boat (not 8-15 like we used) based on their proposed methods: an estimate of 100 – 120 hours of boat electrofishing time for the 6 sweeps of Miramichi Lake needed to remove over 90% of SMB**.**

The water depths in our study were a few meters maximum, and gear effectiveness of EF is limited to these depths (as the authors noted). Our worst capture efficiencies came from sample reaches with deep holes; and even with fish coming shallow to spawn in Miramichi, they will be "scratching the surface" at best. I think the proposed efforts will amount to a short term suppression of the population which will rapidly respond with increased recruitment and growth rates following thinning. I understand the need to "do something", but I do not think the proposal has merit for the stated intentions."

Bill Taylor, President, Atlantic Salmon Federation and for New Brunswick Salmon Council, February 24, 2010:
"Recommendation: The Atlantic Salmon Federation (ASF) and our regional council, the New Brunswick Salmon Council (NBSC), recommend that Fisheries and Oceans Canada (DFO) continue to take the steps necessary toward the authorization of the use of piscidides for the eradication of invasive species that threaten our wild Atlantic salmon and other native fish populations. We believe that it is critical and necessary that DFO have a policy in place that will enable rapid response to situations such as the one with smallmouth bass in the headwaters of one of the most productive wild Atlantic salmon rivers in the world – the Miramichi"

William Hooper, Fisheries Biologist, Watershed Technologies, Amostown, N.B., Summary of Comment, Miramichi Lake Invasion by Smallmouth Bass, March 9, 2010:

"Apparently government agencies are reluctant to reclaim the lake in favour of applying other "control" techniques including netting, electrofishing and downstream "barriers" (to keep the bass in the lake). Management actions the past year have proven the ineffectiveness of these approaches as they treat only the symptoms of the bass introduction, not the problem ……..

"….. The smallmouth bass introduction to Miramichi Lake represents ecological pollution that must be addressed immediately with actions that will prevent irreversible damage to the Miramichi basin's natural fish populations. Conservationists, especially today's fisheries managers, need to consider whether they leave a legacy for future generations as saviors or villains in preserving what is North America's largest wild salmon resource."

John F. Bagnall, Senior Fish Biologist, AMEC, Fredericton, N. B., March 11, 2010:

"In response to your request for my opinion on the ongoing containment program for preventing the spread of Miramichi Lake smallmouth bass. In my opinion, this strategy is doomed to failure. Electrofishing, netting and nest disruption may slow the expansion of the bass population, but as long as there are bass in the lake there is a danger of their emigration and infestation of the Miramichi system. Sooner or later it will happen. The limp-wristed containment program is delaying the inevitable. The lower Miramichi system is ideal bass habitat, and they will become serious predators and competitors with wild Atlantic salmon in the best salmon rivers in the world, a cultural icon of New Brunswick. After this program happens, the managers will throw up their hands and say "oh well, we tried'. The current containment program is also a serious and chronic drain on funds such as the Atlantic Salmon Conservation foundation's Intra-provincial fund for N.B.

" …… DNR and the MSA should be approached to develop an eradication program using pisicides. The argument that these chemicals are not registered for use in N. B. is bogus. They could be approved under a ministerial order ….. "

Rod Currie, Biological Consultant, RA. Currie Ltd., Fredericton, N. B. March 12, 2010:

"The unauthorized release of smallmouth bass into Miramichi Lake was a shameful act that jeopardizes the world renowned salmon fishery of the Miramichi River.

The way government has responded (or not responded) to this threat is similarly shameful. Rather than deal with the problem as soon as it was apparent, both the federal and provincial governments have opted to study the problem which only delays any actual solutions, and increases the risk of bass leaving the lake and entering the Southwest Miramichi River.

Rod Currie quotation of March 12th continued:
When the barrier fence is finally erected, my experience with fish counting fences (from experience on the east coast as well as on the west coast) is that they do not collect every fish. Grilse-sized fish (and larger) routinely slip through/under the fences, or easily pass upstream when the fence is washed out during high-flow events (a common occurrence). The prevalence of untrapped fish is so high that subsequent studies to determine the proportion of marked to unmarked fish beyond the fence are routinely done at counting fences in NB to measure the efficiency of the fence in order to adjust the final fish count.

I would not expect electrofishing (boat and/or shore-based) to successfully eradicate bass from these large, complex habitats. For example, an electrofishing boat cannot access all of the length of the outlet and some sections are too remote and deep for backpack units to effectively cover.

The views expressed above are based on experience gained in a 30-year career mainly working with fish. …I feel the eradication of smallmouth bass from Miramichi Lake and Lake Brook can only be achieved through chemical means."

In view of this body of opinion, the N.B.W.F. is urging government agencies to embark immediately on a plan to treat the lake with chemicals at the earliest possible time.