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CANADA

AQUATIC INVASIVE SPECIES: A NATIONAL PRIORITY

Report of the Standing Committee on Fisheries and Oceans

Ken McDonald, Chair

**JUNE 2019
42nd PARLIAMENT, 1st SESSION**

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**Ken McDonald
Chair**

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NOTICE TO READER

Reports from committee presented to the House of Commons

Presenting a report to the House is the way a committee makes public its findings and recommendations on a particular topic. Substantive reports on a subject-matter study usually contain a synopsis of the testimony heard, the recommendations made by the committee, as well as the reasons for those recommendations.

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THE STANDING COMMITTEE ON FISHERIES AND OCEANS

has the honour to present its

TWENTY-FIFTH REPORT

Pursuant to its mandate under Standing Order 108(2), the Committee has studied aquatic invasive species and has agreed to report the following:

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LIST OF RECOMMENDATIONS

As a result of their deliberations committees may make recommendations which they include in their reports for the consideration of the House of Commons or the Government. Recommendations related to this study are listed below.

Recommendation 1

That the Government of Canada recognize the severe and present threats posed by aquatic invasive species and accelerate their efforts to deliver commitments made by the government in response to the *Spring 2019 Report of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada—Report 1—Aquatic Invasive Species*..... 6

Recommendation 2

That the Government of Canada ensure Fisheries and Oceans Canada has the resources required to fulfill its mandate of protecting aquatic habitats through risk assessments and the consistent and equitable allocation of resources and services for aquatic invasive species activities across Canada..... 10

Recommendation 3

That Fisheries and Oceans Canada take immediate steps to increase their identification and monitoring of potential environmental and socio-economic threats posed by aquatic invasive species by taking the lead along with provincial and territorial governments in establishing a shared system of tracking and coordinating aquatic invasive species programs across jurisdictions. 12

Recommendation 4

That Fisheries and Oceans Canada take immediate steps to track and coordinate programs aimed at the prevention of introduction of aquatic invasive species by taking the lead along with provincial and territorial governments in establishing a shared system of tracking and coordinating aquatic invasive species programs across jurisdictions. 14

Recommendation 5

That Fisheries and Oceans Canada take immediate steps to better monitor introduction pathways and vectors of aquatic invasive species by taking the lead along with provincial and territorial governments in establishing a shared system of tracking and coordinating aquatic invasive species programs across jurisdictions. 15

Recommendation 6

That Fisheries and Oceans Canada take immediate steps to identify aquatic invasive species and associated potential vectors and pathways posing the greatest threats by taking the lead along with provincial and territorial governments in establishing a shared system of tracking and coordinating aquatic invasive species programs across jurisdictions. 18

Recommendation 7

That Fisheries and Oceans Canada take immediate steps to coordinate rapid response plans for aquatic invasive species, especially those species posing the greatest threats of environmental and economic harm, by taking the lead along with provincial and territorial governments in establishing a shared system of tracking and coordinating aquatic invasive species programs across jurisdictions. 19

Recommendation 8

That Fisheries and Oceans Canada establish effective and rapid methods for treatment and eradication of aquatic invasive species by researching products and methods, and by acquiring appropriate government approvals for implementing effective measures, including the application of substances, for safe and rapid treatment and eradication of aquatic invasive species. 20

Recommendation 9

That Fisheries and Oceans Canada provide an exemption for Eurasian Water Milfoil control activities in high-value public areas of the Okanagan as allowed under the *Fisheries Act*. 21



AQUATIC INVASIVE SPECIES: A NATIONAL PRIORITY

INTRODUCTION

Global trade in goods and services and the movement of people has introduced numerous invasive species into habitats outside their natural ranges. With respect to aquatic invasive species (AIS), the impact on commercial, recreational and Indigenous fisheries can be devastating. AIS are now a problem throughout Canada, threatening fresh and marine ecosystems as well as municipal, industrial, hydroelectrical and agricultural infrastructure.

As a result, the House of Commons Standing Committee on Fisheries and Oceans (the Committee) adopted the following motion:

That, whereas indigenous recreational and commercial fisheries are highly valued in Canada and whereas invasive species pose a significant threat to native aquatic species, such as salmon, whales, and the habitats that sustain them, and whereas invasive species pose a significant threat to ecosystems, the environment, and economies, that the Committee undertake a study to examine the Department of Fisheries and Oceans (DFO) aquatic invasive species programs with the objectives of examining the Department's resources and mandate for aquatic invasive species activities to assess: a) the DFO's resources dedicated to preventing and eliminating aquatic invasive species; and b) whether such resources are distributed across Canada in an equitable and consistent manner and whether the AIS program has the resources required to be effective in its mandate; and that the Committee report its findings with recommendations to the House of Commons.¹

The Committee held three public meetings between 29 April 2019 and 8 May 2019, during which it heard testimony from organizations focused on AIS, watershed and irrigation management committees, municipal organizations, conservation organizations, the Canadian Electricity Association, and officials from DFO.

The members of the Committee would like to extend their sincere thanks to all the witnesses who participated in this study. The Committee is pleased to present the results of its study in this report, along with recommendations based on the evidence it heard.

1 House of Commons, Standing Committee on Fisheries and Oceans [FOPO], *Minutes of Proceedings*, 1 May 2019.



BACKGROUND

Canada's Federal Aquatic Invasive Species Framework

The *Fisheries Act*² gives the Minister of Fisheries, Oceans and the Canadian Coast Guard (the Minister) the mandate to protect fish and fish habitat. This is reinforced through section 19(2) of the *Aquatic Invasive Species Regulations*,³ which gives the Minister the ability to prevent the introduction or spread of AIS and to control or eradicate these species. DFO is therefore the lead on AIS for the federal government.

Canada has also made commitments internationally related to AIS. Canada signed and ratified the United Nations' (UN) *Convention on Biological Diversity* in 1992. The targets have changed over the years, and in 2010, the AIS-related target (Target 9) was updated to read: "By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment."⁴

In addition to the *Fisheries Act* and the *Aquatic Invasive Species Regulations*, the Minister also relies on DFO's Aquatic Invasive Species Program (the Program) to uphold its international commitments. The Program

aims to prevent the introduction of aquatic invasive species (AIS) into Canadian waters, to manage selected existing populations of AIS and to provide fisheries managers with information and tools to address AIS. Activities performed by the program include: early detection, response, and management of AIS and the administration of the *Aquatic Invasive Species Regulations*.⁵

Canada has also entered into a partnership with the United States "to prevent the spread of AIS in the Great Lakes through work on the *Great Lakes Water Quality Agreement* and with committees such as the Asian Carp Regional Coordinating Committee (ACRCC)."⁶ Pursuant to a bilateral treaty with the United States establishing

2 [Fisheries Act](#), R.S.C., 1985, c. F-14.

3 [Aquatic Invasive Species Regulations](#), SOR/2015-121.

4 Convention on Biological Diversity, "[Aichi Biodiversity Targets](#)," *Aichi-Targets*.

5 Fisheries and Oceans Canada [DFO], [Aquatic Invasive Species Program](#).

6 DFO, "[Funding and Collaboration—Aquatic Invasive Species](#)," *Scientific research and collaboration*.

the Great Lakes Fishery Commission, Canada provides 31% of the funds for the sea lamprey control program, with the United States providing the remaining 69%.⁷

Commissioner of the Environment and Sustainable Development's 2019 Spring Report

In spring 2019, the Commissioner of the Environment and Sustainable Development (the Commissioner) published Report 1—Aquatic Invasive Species (the Audit).⁸ The Audit's focus was to determine whether "Fisheries and Oceans Canada and the Canada Border Services Agency (CBSA) implemented adequate measures to prevent aquatic invasive species from becoming established in Canadian waters."⁹

The Audit found that rapid detection of new AIS was critical in preventing them from establishing themselves and that the cost of remediation far exceeded the cost of prevention.¹⁰

The Audit concluded that DFO "did not determine which aquatic invasive species and pathways posed the greatest risks to Canada" and "did not systematically collect or maintain information to track aquatic invasive species or the extent of their spread."¹¹

The Audit also determined that when DFO "developed the 2015 Aquatic Invasive Species Regulations, it did not always use science-based information to choose which species to regulate." DFO "did not distinguish its regulatory responsibilities from those of the provinces and territories, including clarifying who was responsible for aquatic invasive freshwater plants."¹²

7 Great Lakes Fishery Commission, "[Budget](#)".

8 Office of the Auditor General of Canada, "[Report 1—Aquatic Invasive Species](#)," 2019 Spring Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada.

9 Office of the Auditor General of Canada, "[Report 1—Aquatic Invasive Species](#)," 2019 Spring Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada.

10 Office of the Auditor General of Canada, "[Report 1—Aquatic Invasive Species](#)," 2019 Spring Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada.

11 Office of the Auditor General of Canada, "[Report 1—Aquatic Invasive Species](#)," 2019 Spring Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada.

12 Office of the Auditor General of Canada, "[Report 1—Aquatic Invasive Species](#)," 2019 Spring Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada; Note: The Audit explains that although DFO acknowledged it may be responsible for regulating aquatic invasive freshwater plants, the Department had not yet come to that conclusion. (paragraph 1.54)



The Audit asserted that DFO “has done limited enforcement of the Aquatic Invasive Species Regulations” and “it did not prevent contaminated boats from entering Canada at the key international border crossing points” in Manitoba and New Brunswick, and “did not develop the procedures, tools, and training that federal, provincial, and territorial enforcement officers needed to enforce the Aquatic Invasive Species Regulations within Canada.”¹³

The Audit observed that DFO “was not ready to act in a timely manner when new aquatic invasive species were detected” and “had undertaken limited work to develop and implement response plans.”¹⁴

The findings led the Commissioner to conclude “that Fisheries and Oceans Canada, as the lead on aquatic invasive species for the federal government, did not implement adequate measures to prevent invasive species from becoming established in Canadian waters.”¹⁵

Recommendation 1

That the Government of Canada recognize the severe and present threats posed by aquatic invasive species and accelerate their efforts to deliver commitments made by the government in response to the *Spring 2019 Report of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada—Report 1—Aquatic Invasive Species*.

Previous Committee Reports

The Committee studied and reported on AIS on several occasions, including:

- Aquatic Invasive Species: Uninvited Guests in 2003 (the 2003 Report);¹⁶

13 Office of the Auditor General of Canada, “[Report 1—Aquatic Invasive Species](#),” *2019 Spring Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada*.

14 Office of the Auditor General of Canada, “[Report 1—Aquatic Invasive Species](#),” *2019 Spring Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada*.

15 Office of the Auditor General of Canada, “[Report 1—Aquatic Invasive Species](#),” *2019 Spring Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada*.

16 FOPO, [Aquatic Invasive Species: Uninvited Guests](#), Fourth Report, 2nd Session, 37th Parliament, May 2003.

- a 2005 follow-up to the recommendations contained in the 2003 report (the 2005 Report);¹⁷ and
- Invasive Species that Pose a Threat to the Great Lakes System in 2013 (the 2013 Report).¹⁸

The main recommendations from the 2003 Report were the following:

- That DFO inventory AIS that pose the greatest threats to the Canadian ecosystem and economy; and
- That DFO identify and manage pathways that pose the highest risks.

In 2005, the Committee re-examined the issue of AIS because it observed that “while slow progress has been made in some areas, there was no progress observed in several others.” The Committee reiterated its 2003 recommendations and further recommended that DFO submit a report to Parliament on federal actions relating to AIS, to be referred to the Committee.

Finally, in the 2013 Report, the Committee made the following key recommendations:

- That the federal government work with provinces and territories to increase enforcement of illegal trade in live invasive species; and

17 FOPO, *Aquatic Invasive Species*, Third Report, 1st Session, 38th Parliament, June 2005.

18 FOPO, *Invasive Species that Pose a Threat to the Great Lakes System*, Fourth Report, 1st Session, 41st Parliament, April 2013.



- That the federal government develop a comprehensive long-term framework and funding strategy for the management of AIS.

WHAT THE COMMITTEE HEARD

Throughout the Committee’s study, a number of themes were repeatedly raised, in particular, the need to address regional funding gaps, promote and resource prevention programs, coordinate federal and provincial/territorial AIS strategies, and develop rapid responses to eradicate AIS.

Andrew Bouzan of the Newfoundland and Labrador Wildlife Federation emphasized that “[i]nvasive species are essentially a biological pollution, in whatever ecosystem they find them, to native species and to ecosystems as a whole.”¹⁹

The Committee heard from all witnesses that AIS threaten both fresh and marine ecosystems and biodiversity and that this threat should be treated seriously; the Committee agrees wholeheartedly with this assessment.

Aquatic Invasive Species Program Resourcing

A. Resource Allocation and Regional Funding Disparities

As noted by DFO in its appearance before the Committee, Budget 2017 allocated \$43.8 million in A-base funding over five years plus an additional \$10.6 million annually for “national AIS activities, including the establishment of a new AIS national core program, renewal of the Asian carp program, and support to the sea lamprey control program.”²⁰

Despite this injection of funding, witnesses raised concerns about the equitable distribution of federal AIS resources. Gail Wallin of the Invasive Species Council of BC explained that “investments by Fisheries and Oceans need to be strategic and need to address, in our opinion, all of Canada, not just the Great Lakes.”²¹ Andrew Bouzan

19 Andrew Bouzan, President, Newfoundland and Labrador Wildlife Federation, *Evidence*, 29 April 2019.

20 Philippe Morel, Assistant Deputy Minister, Aquatic Ecosystems Sector, Department of Fisheries and Oceans, *Evidence*, 8 May 2019.

21 Gail Wallin, Executive Director, Invasive Species Council of BC, *Evidence*, 29 April 2019.

explained his concern about AIS funding allocation in Canada, noting that although sea lamprey and Asian carp are important AIS, “Ontario gets the lion’s share” of funding and “the funding allocated to the rest of the country is almost nothing.”²²

The Government of British Columbia called on the Government of Canada to also focus on Western Canada’s priorities, namely zebra and quagga mussels.²³ In response, DFO noted that in August 2018, it reallocated funds to non-governmental organizations to prevent the spread of zebra and quagga mussels in British Columbia.²⁴

The Alberta Urban Municipalities Association drew attention to the “lack of awareness” of the AIS program in Alberta and that the lack support from the federal government is noticeable among its membership.²⁵

Provincial and local government organizations have been investing in AIS programs, often without federal funding partners. The Government of British Columbia pointed out that the provincial government, along with partners in the hydroelectric industry invested over \$3.75 million in the Invasive Mussel Defence Program in 2018-2019. Anna Warwick Sears of the Okanagan Basin Water Board, explained that her organization is fully funded through municipal taxes, to the tune of \$850,000 annually. The Board is tasked with controlling Eurasian water milfoil (a fast-growing aquatic plant), which has been established in the area for 40 years and cannot be eradicated.²⁶

Many of the organizations the Committee heard from did not receive federal funding to implement their public education, prevention and remediation projects.

Bob McLean of the Canadian Council on Invasive Species cautioned, however, that “shifting current resources among programs is likely to simply shift the problems and risks from one part of the country to another.”²⁷ The Committee agrees with this assessment and therefore believes that additional funding should be dedicated to the prevention, control and eradication of AIS across Canada. Deborah Sparks of the Invasive Species Centre called for the “establishment of an integrated national AIS program with

22 Andrew Bouzan, President, Newfoundland and Labrador Wildlife Federation, [Evidence](#), 29 April 2019.

23 Hon. Doug Donaldson, Minister of Forests, Lands and Natural Resource Operations, and Rural Development, Government of British Columbia, [Brief](#), 24 April 2019.

24 Philippe Morel, Assistant Deputy Minister, Aquatic Ecosystems Sector, Department of Fisheries and Oceans, [Evidence](#), 8 May 2019.

25 Barry Morishita, President, Alberta Urban Municipalities Association, [Brief](#), 14 May 2019.

26 Anna Warwick Sears, Executive Director, Okanagan Basin Water Board, [Evidence](#), 29 April 2019.

27 Bob McLean, Strategic Partnerships, Canadian Council on Invasive Species, [Evidence](#), 6 May 2019.



a transparent and efficient system for screening and assessing risk” to ensure an equitable evidence-based allocation of funds based on risks.²⁸

In response to the concerns expressed regarding resource allocation, DFO Assistant Deputy Minister Philippe Morel responded that “the distribution of the money is quite equal between all the regions, although it is based on where the species are located.”²⁹ He also clarified that while DFO is the lead department on AIS in the marine environment, provinces and territories are oftentimes the lead for AIS in freshwater environments, and that “the AIS national program is not equipped to fund provincial or territorial activities, as this is not our role.”³⁰

Recommendation 2

That the Government of Canada ensure Fisheries and Oceans Canada has the resources required to fulfill its mandate of protecting aquatic habitats through risk assessments and the consistent and equitable allocation of resources and services for aquatic invasive species activities across Canada.

B. Effectiveness

Deborah Sparks suggested that risk and the potential impact to ecosystems, the economy and society should be the criteria that could help determine resource allocation.³¹ Gail Wallin explains that “the investments have to move from chasing and trying to restore something into prevention. If we can prevent mussels from coming to the west or we can prevent a new invasive species coming in, we'll save all those dollars you have to spend chasing a species afterwards.”³²

The Committee heard from many witnesses that more funding should be allocated to prevention and awareness, which helps reduce remediation costs as well as reduce the

28 Deborah Sparks, Business Development and Communications Manager, Invasive Species Centre, [Evidence](#), 29 April 2019.

29 Philippe Morel, Assistant Deputy Minister, Aquatic Ecosystems Sector, Department of Fisheries and Oceans, [Evidence](#), 8 May 2019.

30 Philippe Morel, Assistant Deputy Minister, Aquatic Ecosystems Sector, Department of Fisheries and Oceans, [Evidence](#), 8 May 2019.

31 Deborah Sparks, Business Development and Communications Manager, Invasive Species Centre, [Evidence](#), 29 April 2019.

32 Gail Wallin, Executive Director, Invasive Species Council of BC, [Evidence](#), 29 April 2019.

social, economic, and environmental impacts AIS can have on water-adjacent communities.

C. Cost of Invasion

Robyn Hooper of the Columbia Shuswap Invasive Species Society noted that “[i]n Ontario alone, zebra and quagga mussel infestations have created annual costs of nearly \$100 million for the provincial, regional and municipal governments, utility companies, business owners and citizens.”³³ Likewise, the Alberta Urban Municipalities Association indicated that the estimated economic impact of AIS in Alberta is over \$75 million annually. On the East Coast, the Prince Edward Island Invasive Species Council explained that invasive tunicates and green crab are having detrimental impacts on cultured mussels and clams respectively.³⁴

With such a high cost, the Committee understands and agrees that, whenever possible, prevention programs are key.

Margo Jarvis Redelback of the Alberta Irrigation Districts Association, explained that the invasion of zebra and quagga mussels into its almost 8,000 kilometres of conveyance canals and buried water pipelines, which “delivers water to about 1.4 million acres of agricultural land for food production” could be extremely costly, with the total amount of irrigation infrastructure valued at an estimated \$3.6 billion.³⁵ In fact, she pointed out that “[a]nnual treatment costs of treating all irrigation district pipeline infrastructure with potash [a yet to be approved treatment method] is estimated to be about \$1.1 million.”³⁶

Erin Bates of the Central Kootenay Invasive Species Society noted that the invasion of zebra and quagga mussels could have an economic impact worth \$43 million per year on “hydro power, agricultural irrigation, municipal water supplies and recreational boating in B.C.”³⁷ The Greater Vernon Chamber of Commerce also emphasized that “no price tag can be put on the damage that would be done to the Okanagan’s reputation as Canada’s premiere summer destination.”

33 Robyn Hooper, Executive Director, Columbia Shuswap Invasive Species Society, *Evidence*, 29 April 2019.

34 Barry Murray, Council Member, Prince Edward Island Invasive Species Council, *Brief*, 26 April 2019.

35 Margo Jarvis Redelback, Executive Director, Alberta Irrigation Districts Association, *Evidence*, 6 May 2019.

36 Margo Jarvis Redelback, Executive Director, Alberta Irrigation Districts Association, *Evidence*, 6 May 2019.

37 Erin Bates, Executive Director, Central Kootenay Invasive Species Society, *Evidence*, 6 May 2019.



Recommendation 3

That Fisheries and Oceans Canada take immediate steps to increase their identification and monitoring of potential environmental and socio-economic threats posed by aquatic invasive species by taking the lead along with provincial and territorial governments in establishing a shared system of tracking and coordinating aquatic invasive species programs across jurisdictions.

Prevention Programs

A. Pathways for Introduction

Gail Wallin explained that AIS work “is often focused on what we call pathways, because we know that managing species by species is a lost economic cause.”

Instead of remediation, the Committee heard from Hugh MacIsaac that it is “far more effective, and in many cases a lot cheaper, if we instead monitor and regulate by pathways.”³⁸ This could help ensure that species that are known threats and those that are still unknown are controlled to some extent by screening pathways.

Gail Wallin provided the Committee with an example of how New Zealand has closed an introduction pathway—shipping containers. She explained that shipping containers coming into New Zealand are inspected to ensure they are aquatic invasive species free.³⁹

Another pathway identified to the Committee is the trade in live plants and animals, and some apparent regulatory disconnects. Hugh MacIsaac pointed out that in “Ontario we have a case where at the same time as people are free to sell plants on the Internet, the Ontario government is conducting an eradication program.”⁴⁰

Witnesses were particularly vocal about watercraft inspections and decontamination. Anna Warwick Sears explained that in the Okanagan, they are contemplating starting a

38 Hugh MacIsaac, Professor and Canada Research Chair in Aquatic Invasive Species, University of Windsor, Great Lakes Institute for Environmental Research, *Evidence*, 29 April 2019.

39 Gail Wallin, Executive Director, Invasive Species Council of BC, *Evidence*, 29 April 2019.

40 Hugh MacIsaac, Professor and Canada Research Chair in Aquatic Invasive Species, University of Windsor, Great Lakes Institute for Environmental Research, *Evidence*, 29 April 2019.

GoFundMe campaign to get dogs able to inspect boats and detect the presence of AIS as a means of prevention.⁴¹

Paul Demenok of the Shuswap Watershed Council explained that: “We need 24/7, 365 coverage by Canada Border Service Agency preventing boats coming into B.C. from the United States.”⁴² The Regional District of North Okanagan and the Central Kootenay Invasive Species Society concurred with this recommendation.⁴³ However, the Committee heard from Gail Wallin that federal funding for 24/7 coverage may be an unrealistic expectation.⁴⁴

The Government of British Columbia also recommended increasing the federal budget for staffing and other resources at the U.S.-Canada border, while Paul Demenok added that boats transported between provinces should also be inspected.⁴⁵

B. Collaboration

Hugh MacIsaac outlined a collaborative way of reducing the risk of spread of zebra mussels from Lake Winnipeg to other waterbodies west of the lake. “Rather than doing it piecemeal with each province in the west trying to do it on its own, we need to put in sufficient money and quarantine Lake Winnipeg and the lake just north of it that is also colonized.”⁴⁶

Raymond Orb of the Saskatchewan Association of Rural Municipalities emphasized the need for federal leadership, while recognizing the role of all levels of government.⁴⁷

As voiced by Bob McLean, “success will not be achieved by any one organization acting alone.”⁴⁸ He explained to the Committee that the National Aquatic Invasive Species Committee is a joint federal-provincial/territorial committee and noted that it is a key

41 Anna Warwick Sears, Executive Director, Okanagan Basin Water Board, *Evidence*, 29 April 2019.

42 Paul Demenok, Chair, Shuswap Watershed Council, *Evidence*, 6 May 2019.

43 Kevin Acton, Chair, Regional District of North Okanagan, *Brief*, 15 April 2019; Erin Bates, Executive Director, Central Kootenay Invasive Species Society, *Evidence*, 6 May 2019.

44 Gail Wallin, Executive Director, Invasive Species Council of BC, *Evidence*, 29 April 2019.

45 Paul Demenok, Chair, Shuswap Watershed Council, *Evidence*, 6 May 2019.

46 Hugh MacIsaac, Professor and Canada Research Chair in Aquatic Invasive Species, University of Windsor, Great Lakes Institute for Environmental Research, *Evidence*, 29 April 2019.

47 Raymond Orb, President, Saskatchewan Association of Rural Municipalities, *Evidence*, 6 May 2019.

48 Bob McLean, Strategic Partnerships, Canadian Council on Invasive Species, *Evidence*, 6 May 2019.



mechanism for the federal and provincial/territorial governments to collaborate and identify AIS priorities.⁴⁹

Al Kemmere of the Rural Municipalities of Alberta highlighted that a National AIS Strategy “should include prevention, eradication and a cross-boundary collaboration and coordination so that we work on this together, province to province countrywide and also with our neighbours to the south.”⁵⁰ He explained that “provincial programs, such as those in Alberta, are proving to be effective, but they would be greatly aided by a coordinated response with other provincial programs and a nationwide program.”⁵¹

Recommendation 4

That Fisheries and Oceans Canada take immediate steps to track and coordinate programs aimed at the prevention of introduction of aquatic invasive species by taking the lead along with provincial and territorial governments in establishing a shared system of tracking and coordinating aquatic invasive species programs across jurisdictions.

C. Monitoring

In discussing the global ballast water treatment treaty that was adopted in 2004 (i.e., the *International Convention for the Control and Management of Ships' Ballast Water and Sediments* or the BWM Convention⁵²), Hugh MacIsaac noted that: “there's no ballast water funds from DFO to determine the effectiveness” of the treaty on the introduction of AIS.⁵³ He recommended that funding be allocated to study the effect of such treaties.

Hugh MacIsaac explained that between 2005 and 2015, a national research network on AIS (funded predominantly by DFO and in part by the Natural Sciences and Engineering Research Council (NSERC), Transport Canada and certain provincial governments) was very successful. He noted that: “We did a tremendous number of studies across the

49 Bob McLean, Strategic Partnerships, Canadian Council on Invasive Species, *Evidence*, 6 May 2019.

50 Al Kemmere, President, Rural Municipalities of Alberta, *Evidence*, 6 May 2019.

51 Al Kemmere, President, Rural Municipalities of Alberta, *Evidence*, 6 May 2019.

52 International Maritime Organization, *Ballast Water Management*.

53 Hugh MacIsaac, Professor and Canada Research Chair in Aquatic Invasive Species, University of Windsor, Great Lakes Institute for Environmental Research, *Evidence*, 29 April 2019.

country [and it is] a very effective way to leverage funding from other sources, as well as personnel from other groups, to work on these issues.”⁵⁴

Hugh MacIsaac spoke of using local water samples to test for environmental DNA, which could help scientists determine if certain AIS are present in a waterbody. He observed that although the start-up costs are significant, the costs per sample afterwards range from \$20 to \$30. He also noted that Australia and New Zealand are investing in this type of technology.⁵⁵

Furthermore, the Prince Edward Island Invasive Species Council explained, that DFO Science is actively monitoring the Southern Gulf of St. Lawrence for new invasive species on the East Coast such as the pancake batter tunicate, which has already had “significant impacts on the aquaculture sector and fish habitat in B.C. and on the East Coast of the U.S.”⁵⁶

Recommendation 5

That Fisheries and Oceans Canada take immediate steps to better monitor introduction pathways and vectors of aquatic invasive species by taking the lead along with provincial and territorial governments in establishing a shared system of tracking and coordinating aquatic invasive species programs across jurisdictions.

D. Engaging Canadians

Witnesses highlighted the need to engage Canadians in the fight to prevent the spread of AIS, including modifying practices related to fishing, backyard water gardens or aquarium cleaning.⁵⁷

Bob McLean explained:

We need some strategic compliance and enforcement effort on the part of governments, federally and provincially. Then we need to complement that with these

54 Hugh MacIsaac, Professor and Canada Research Chair in Aquatic Invasive Species, University of Windsor, Great Lakes Institute for Environmental Research, *Evidence*, 29 April 2019.

55 Hugh MacIsaac, Professor and Canada Research Chair in Aquatic Invasive Species, University of Windsor, Great Lakes Institute for Environmental Research, *Evidence*, 29 April 2019.

56 Barry Murray, Council Member, Prince Edward Island Invasive Species Council, *Brief*, 26 April 2019.

57 Gail Wallin, Executive Director, Invasive Species Council of BC, *Evidence*, 29 April 2019.



campaigns designed to not only help Canadians be aware but help to understand how they can change their activities to produce the results that we want.⁵⁸

Paula Noel of the New Brunswick Invasive Species Council agreed and suggested that a hands-on approach with demonstrations of prevention techniques is advisable.⁵⁹

Aquatic Invasive Species Regulations

A. Effective Regulations

With respect to the 2015 *Aquatic Invasive Species Regulations*, Deborah Sparks reiterated that “a national [AIS] program is needed to build operational capacity to fulfill those regulations.”⁶⁰

On the federal and provincial roles related to AIS, Gail Wallin noted that “there are some areas that are clear, but there are lots of grey areas to be clarified at the federal level and with provincial and territorial governments.”⁶¹ For his part, Michael B. Powell of the Canadian Electricity Association called for clarity to ensure that governments “maintain the ability to utilize biocides to reduce the spread of invasive species and ensure that all federal and provincial regulations are aligned and consistent in this matter.”⁶²

B. Enforcement

According to Gail Wallin, the *Aquatic Invasive Species Regulations* need “to have a stronger, more rapid listing of species, and it needs to be enforced. Enforcement can both be on the compliance side and also working with Canadians and getting them engaged.”⁶³

Raymond Orb expressed his concern that the Regulations are not being adequately enforced. He stated that “more needs to be done to ensure that both DFO and CBSA officials are properly equipped to prevent AIS from entering into Canada. It's also critical

58 Bob McLean, Strategic Partnerships, Canadian Council on Invasive Species, [Evidence](#), 6 May 2019.

59 Paula Noel, Volunteer Member, New Brunswick Invasive Species Council, [Evidence](#), 6 May 2019.

60 Deborah Sparks, Business Development and Communications Manager, Invasive Species Centre, [Evidence](#), 29 April 2019.

61 Gail Wallin, Executive Director, Invasive Species Council of BC, [Evidence](#), 29 April 2019.

62 Michael B. Powell, Director, Government Relations, Canadian Electricity Association, [Evidence](#), 6 May 2019.

63 Gail Wallin, Executive Director, Invasive Species Council of BC, [Evidence](#), 29 April 2019.

that these government agencies clearly understand their responsibilities as they pertain to AIS.”⁶⁴

Public Education Initiatives

Many witnesses highlighted the need to educate the public about the AIS and AIS threats in their region. An example would be a collaborative database showing the location of AIS infestations such as zebra mussels or Eurasian water milfoil and allowing citizens to report sightings.⁶⁵

Bob McLean observed that:

Canadians care and we believe will help to prevent introduction if they're provided with the appropriate tools and resources. There is a need to increase education and awareness campaigns to change the behaviour of those target audiences, those folks who may actually move invasive species into new areas of the country.⁶⁶

Elimination of Aquatic Invasive Species

Despite best efforts at prevention, the Committee heard about the need to eliminate AIS that establish themselves in Canadian waters. The elimination strategies must include early detection, rapid response, and effective treatment options.

A. Early Detection

According to Deborah Sparks:

most invasions follow a similar pattern, commonly referred to as the invasion curve, that compares time to area occupied, beginning from the first occurrence of the species in a new area. As time goes on, the species spreads further into the environment almost exponentially until it becomes widely established. If the species is detected early in the curve, then eradication may be possible. However, if the species becomes widespread and established, eradication is much less likely and much more costly.⁶⁷

64 Raymond Orb, President, Saskatchewan Association of Rural Municipalities, [Evidence](#), 6 May 2019.

65 Gail Wallin, Executive Director, Invasive Species Council of BC, [Evidence](#), 29 April 2019; Bob McLean, Strategic Partnerships, Canadian Council on Invasive Species, [Evidence](#), 6 May 2019; Paula Noel, Volunteer Member, New Brunswick Invasive Species Council, [Evidence](#), 6 May 2019.

66 Bob McLean, Strategic Partnerships, Canadian Council on Invasive Species, [Evidence](#), 6 May 2019.

67 Deborah Sparks, Business Development and Communications Manager, Invasive Species Centre, [Evidence](#), 29 April 2019.



Hugh MacIsaac also underscored that “we really ought to be devoting more resources [to the Arctic] than we are right now.”⁶⁸ In fact, he noted that climate change will influence the spread of AIS. He explained that some research on this is underway, but that “[w]e should have substantial funding for projects like that.”⁶⁹

Bob McLean recommended a “collaborative Canada-wide prioritization and planning based on sound risk assessment and risk management strategies.”⁷⁰ When DFO officials appeared before the Committee, it was pointed out that DFO performed risk assessments “for hundreds of species” as well as for “specific species that are known to be close to invade or just detected.”⁷¹

Paula Noel provided the Committee the following cautionary tale; even though the Eurasian water milfoil was detected in a watershed in New Brunswick in 2017,

there has been virtually no response to this introduction. There has been no attempts to contain, eradicate or even educate boaters using these waterways on how they can help to prevent from spreading this species faster within the Saint John River watershed or to other waterways in the province by cleaning plant material off boats and trailers.⁷²

Recommendation 6

That Fisheries and Oceans Canada take immediate steps to identify aquatic invasive species and associated potential vectors and pathways posing the greatest threats by taking the lead along with provincial and territorial governments in establishing a shared system of tracking and coordinating aquatic invasive species programs across jurisdictions.

B. Rapid Response Plans

Witnesses spoke of the need to have AIS rapid response plans in place. Andrew Bouzan said AIS “have the potential to cause irreversible harm and destroy and eradicate entire

68 Hugh MacIsaac, Professor and Canada Research Chair in Aquatic Invasive Species, University of Windsor, Great Lakes Institute for Environmental Research, [Evidence](#), 29 April 2019.

69 Hugh MacIsaac, Professor and Canada Research Chair in Aquatic Invasive Species, University of Windsor, Great Lakes Institute for Environmental Research, [Evidence](#), 29 April 2019.

70 Bob McLean, Strategic Partnerships, Canadian Council on Invasive Species, [Evidence](#), 6 May 2019.

71 Simon Nadeau, Senior Advisor, Ecosystem Science, Department of Fisheries and Oceans, [Evidence](#), 8 May 2019.

72 Paula Noel, Volunteer Member, New Brunswick Invasive Species Council, [Evidence](#), 6 May 2019.

environments, whether we are talking about marine environments or freshwater environments.”⁷³

Bob McLean also emphasized that:

recognizing and reporting invasive species when they first arrive and before they are established is the key to prevent establishment. [...] Early detection depends on monitoring and detection systems, and it's important to recognize we think the role and contribution that citizen science can play.⁷⁴

Recommendation 7

That Fisheries and Oceans Canada take immediate steps to coordinate rapid response plans for aquatic invasive species, especially those species posing the greatest threats of environmental and economic harm, by taking the lead along with provincial and territorial governments in establishing a shared system of tracking and coordinating aquatic invasive species programs across jurisdictions.

C. Treatment Programs

If AIS establish themselves in a body of water, there must be a treatment and eradication plan available to implement upon discovery of the infestation. Paula Noel underscored that “you have to immediately respond to that threat and try your best to eradicate it. The only time you have a chance of eradicating an invasive species is when it's first been discovered.”⁷⁵

Witnesses such as Anna Warwick Sears gave mixed reviews on using predator control methods, explaining:

there are some things that have to do with genetic engineering of a bacterium and things like that, which have potential. There have been a lot of bad examples of natural enemies being released, but there also have been some cases of things working. There are some techniques that have to do with soil bacteria and things like that released to control mosquitos. They're working on something like that for zebra mussels, as well.⁷⁶

Reinforcing the idea that prevention is key, Anna Warwick Sears added that:

73 Andrew Bouzan, President, Newfoundland and Labrador Wildlife Federation, *Evidence*, 29 April 2019.

74 Bob McLean, Strategic Partnerships, Canadian Council on Invasive Species, *Evidence*, 6 May 2019.

75 Paula Noel, Volunteer Member, New Brunswick Invasive Species Council, *Evidence*, 6 May 2019.

76 Anna Warwick Sears, Executive Director, Okanagan Basin Water Board, *Evidence*, 29 April 2019.



eradication is almost impossible in most cases, once an invasive species gets established. There are some exceptions. If you have a lake that is very well defined, you can add rotenone to it and you can eradicate things on a small scale. But if something is persistent on a geographic scale, you can't get rid of it. You just have to figure out how to manage it.⁷⁷

While a DFO official claimed that rotenone is a “very nasty product” that “will kill everything that breeds,”⁷⁸ other witnesses such as Mark Hambrook of the Miramichi Salmon Association suggested that the use of rotenone on the Miramichi Lake to eradicate the smallmouth bass can be a safe and low impact technique, explaining that:

before an application of rotenone is implemented, you capture all the native species and hold native species off site while the application is administered, which takes a day. It will be effective for about a week or so afterwards. After that, the level drops and those species can be put back in. This doesn't affect any of the insects or the aquatic life in the lake—just the fish.⁷⁹

In the Government of British Columbia's view, DFO should “take a leadership role” to coordinate with federal agencies including Health Canada to “ensure that provinces and territories have rapid access to federally regulated pesticides.”⁸⁰

Recommendation 8

That Fisheries and Oceans Canada establish effective and rapid methods for treatment and eradication of aquatic invasive species by researching products and methods, and by acquiring appropriate government approvals for implementing effective measures, including the application of substances, for safe and rapid treatment and eradication of aquatic invasive species.

Daniel Stanley of the Canadian Electricity Association recommended that the federal government grant “funding for further studies that explore safer and more environmentally friendly control alternatives is essential” because certain control measures used by industry can “damage aquatic environments and native species” (e.g., the use of hypochlorite to remove dreissenids, freshwater mussels, from hydroelectric

77 Anna Warwick Sears, Executive Director, Okanagan Basin Water Board, *Evidence*, 29 April 2019.

78 Simon Nadeau, Senior Advisor, Ecosystem Science, Department of Fisheries and Oceans, *Evidence*, 8 May 2019.

79 Mark Hambrook, President, Miramichi Salmon Association Inc., *Evidence*, 6 May 2019.

80 Hon. Doug Donaldson, Minister of Forests, Lands and Natural Resource Operations, and Rural Development, Government of British Columbia, *Brief*, 24 April 2019.

facilities).⁸¹ One method raised by Mr. Stanley is the use of hydro plants to drain a watercourse to relocate native species and humanely dispose of AIS.”⁸²

In British Columbia, the Okanagan Basin Water Board uses rototilling to kill Eurasian water milfoil roots but is now being hampered in its efforts due to the presence of the Rocky Mountain ridged mussel, which is listed under the *Species at Risk Act*⁸³ despite being abundant throughout the western United States. Anna Warwick Sears therefore requested an exemption under the *Fisheries Act*, to allow the rototilling work to continue.⁸⁴

Recommendation 9

That Fisheries and Oceans Canada provide an exemption for Eurasian Water Milfoil control activities in high-value public areas of the Okanagan as allowed under the *Fisheries Act*.

CONCLUSIONS

During its study, the Committee heard from a wide range of witnesses representing diverse interests and viewpoints. Common themes included: prevention; rapid, effective and coordinated responses; more equitable and increased federal funding.

The Committee understands that some AIS are in Canada to stay, but that many others can either be eradicated or simply prevented from entering our waterways. Committee members thank those organizations—governmental and non-governmental—that work towards these goals and hope that DFO can leverage this work by better supporting these organizations and their initiatives now and into the future.

81 David Stanley, Senior Environmental Specialist, Ontario Power Generation, Canadian Electricity Association, *Evidence*, 6 May 2019.

82 David Stanley, Senior Environmental Specialist, Ontario Power Generation, Canadian Electricity Association, *Evidence*, 6 May 2019.

83 *Species at Risk Act*, S.C. 2002, c. 29.

84 Anna Warwick Sears, Executive Director, Okanagan Basin Water Board, *Evidence*, 29 April 2019.

APPENDIX A LIST OF WITNESSES

The following table lists the witnesses who appeared before the Committee at its meetings related to this report. Transcripts of all public meetings related to this report are available on the Committee’s [webpage for this study](#).

Organizations and Individuals	Date	Meeting
Columbia Shuswap Invasive Species Society Robyn Hooper, Executive Director	2019/04/29	141
Great Lakes Institute for Environmental Research Hugh MacIsaac, Professor and Canada Research Chair in Aquatic Invasive Species University of Windsor	2019/04/29	141
Invasive Species Centre Rebecca Schroeder, Liaison Aquatic Invasive Species Deborah Sparks, Business Development and Communications Manager	2019/04/29	141
Invasive Species Council of BC Jodi Romyn, Senior Manager Gail Wallin, Executive Director	2019/04/29	141
Newfoundland and Labrador Wildlife Federation Andrew Bouzan, President	2019/04/29	141
Okanagan Basin Water Board Anna Warwick Sears, Executive Director	2019/04/29	141
Alberta Irrigation Districts Association Margo Jarvis Redelback, Executive Director	2019/05/06	143
Canadian Council on Invasive Species Bob McLean, Strategic Partnerships	2019/05/06	143

Organizations and Individuals	Date	Meeting
<p>Canadian Electricity Association</p> <p>Michael B. Powell, Director Government Relations</p> <p>David Stanley, Senior Environmental Specialist Ontario Power Generation</p>	2019/05/06	143
<p>Central Kootenay Invasive Species Society</p> <p>Erin Bates, Executive Director</p>	2019/05/06	143
<p>Miramichi Salmon Association Inc.</p> <p>Mark Hambrook, President</p>	2019/05/06	143
<p>New Brunswick Invasive Species Council</p> <p>Paula Noel, Volunteer Member</p>	2019/05/06	143
<p>Ontario Federation of Anglers and Hunters</p> <p>Matt DeMille, Manager Fish and Wildlife Services</p> <p>Sophie Monfette, Coordinator Invading Species Awareness Program</p>	2019/05/06	143
<p>Rural Municipalities of Alberta</p> <p>Al Kemmere, President</p>	2019/05/06	143
<p>Saskatchewan Association of Rural Municipalities</p> <p>Raymond Orb, President</p>	2019/05/06	143
<p>Shuswap Watershed Council</p> <p>Paul Demenok, Chair</p> <p>Erin Vieira, Program Manager</p>	2019/05/06	143
<p>Department of Fisheries and Oceans</p> <p>Hélène Marquis, Executive Director Fisheries Protection Program and Major Projects</p> <p>Philippe Morel, Assistant Deputy Minister Aquatic Ecosystems Sector</p> <p>Simon Nadeau, Senior Advisor Ecosystem Science</p> <p>Brent Napier, Chief Enforcement Programs</p>	2019/05/08	144

APPENDIX B LIST OF BRIEFS

The following is an alphabetical list of organizations and individuals who submitted briefs to the Committee related to this report. For more information, please consult the Committee's [webpage for this study](#).

Alberta Irrigation Districts Association

Alberta Urban Municipalities Association

Canadian Council on Invasive Species

Greater Vernon Chamber of Commerce

Invasive Species Council of BC

New Brunswick Invasive Species Council

Ontario Federation of Anglers and Hunters

Prince Edward Island Invasive Species Council

Regional District of North Okanagan

Rural Municipalities of Alberta

Saskatchewan Association of Rural Municipalities

REQUEST FOR GOVERNMENT RESPONSE

Pursuant to Standing Order 109, the Committee requests that the government table a comprehensive response to this Report.

A copy of the relevant *Minutes of Proceedings* ([Meetings Nos. 141, 143 to 145, 148 and 150](#)) is tabled.

Respectfully submitted,

Ken McDonald
Chair

