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Chair

Mr. Ken McDonald

Standing Committee on Fisheries and Oceans

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● (1530)

[*English*]

The Chair (Mr. Ken McDonald (Avalon, Lib.)): Good afternoon, everyone. Welcome back after our short Easter break.

Pursuant to Standing Order 108(2), we are on our study of aquatic invasive species. Today, of course, we have witnesses here, both in person and by video conference.

From the Columbia Shuswap Invasive Species Society, Robyn Hooper, executive director, is joining us by video conference. From the Great Lakes Institute for Environmental Research, we have Dr. Hugh MacIsaac, professor and Canada research chair in aquatic invasive species, University of Windsor. From the Invasive Species Centre, we have two witnesses by video conference: Deborah Sparks, manager, business development and communications, and Rebecca Schroeder, liaison, aquatic invasive species.

From the Invasive Species Council of BC, in person we have Gail Wallin, the executive director, and by video conference, hopefully, Jodi Romyn, senior manager. From the Newfoundland and Labrador Wildlife Federation, by video conference as well, we have Andrew Bouzan, president. From the Okanagan Basin Water Board, we have Anna Warwick Sears, executive director.

Welcome, everybody.

I would like to welcome Mr. Shields, the member for Bow River, and Mr. Breton, the member for Shefford, who are sitting in today.

We look forward to your input.

To start off, I'll remind the witnesses that the opening statements are for seven minutes or less. I will try to hold it as close to that as possible.

We like to start with the witnesses by video conference, but we have nothing on our screens. While we're waiting, we'll jump ahead and let Ms. Wallin do her presentation for seven minutes or less.

Go ahead, please.

Ms. Gail Wallin (Executive Director, Invasive Species Council of BC): Thank you very much for having us, Mr. Chair.

I'm here with Jodi Romyn from our organization. Jodi and I will be with you for the day. I have to apologize, but I will be stepping out a little bit early in order to catch the last flight I need for the night.

The Invasive Species Council of British Columbia is the largest and oldest organization in Canada that's focused simply on invasive species. We've been around 15 to 20 years now, and we're governed by a board of directors. Our board of directors is quite unique in that it has members of governments, indigenous, business and communities on our board. Aquatics have been a part of our mandate since the early 2000s, and we've been working on what are now becoming national programs for aquatic invasive species. Our work focuses on making sure that people have the right tools and information in order to stop the spread.

I'm assuming, because you're sitting in an aquatic invasive species group here today, that you already know that Canada has 20% of our fresh water. You know that we have three major coastlines, and that our waters are really important to indigenous cultures, rural communities and certainly, being from British Columbia, really important to all of our members across the province.

Our work is often focused on what we call pathways, because we know that managing species by species is a lost economic cause. We want to really make sure that we're looking at trying to close the pathways that cause the spread of invasive species. It actually turns out that most invasive species are moved—both in our province, which I'm particularly focusing on, and across the country—by people, intentionally or unintentionally. The solution, then, is to stop how they're spread by people.

In British Columbia, things like salmon, bivalves and trout are really important. I come from a rural community. They're really important for our rural residents, but they're particularly important for our indigenous cultures, which is a really big factor in British Columbia, as I'm sure you know through your work federally.

I want to thank you again for doing this study. This is excellent, and it's really neat to not only see this come out in a standing committee today, but also on the tail of the Auditor General's report on fisheries and oceans. It's been great to see that. It's great to see that Fisheries and Oceans has responded to the Auditor General's report and that it is tackling the challenges that were raised.

There are definitely some things you've raised at this committee that are really important. First of all, investments by Fisheries and Oceans need to be strategic and need to address, in our opinion, all of Canada, not just the Great Lakes. Sorry, Ontario, but that's been a big focus and we feel a lot of the other parts of Canada still need have this investment.

It's important to move funds from inside of government to ensure things happen on the ground. One of the things the Auditor General's report called for was focusing on and restricting enclosing high-risk pathways and making sure there's responsible practices in place that close those pathways. Government can't do that alone. You can't work with the pet and aquarium trade and close those unless you work with the pet and aquarium trade. You can't stop boaters from moving invasive species unless you work with boaters. That collaboration is really important.

We recognize that DFO has more staff since it started the aquatic invasive program three years ago in 2017, but there needs to be more movement hitting the ground, heading action on the ground, where organizations, governments and indigenous communities can make a difference.

The investments need to be much more strategically invested across Canada. We know the sea lamprey has been a major investment for the federal government, but we in the west feel that stopping and preventing invasive mussels from becoming established in the west is equally important in order to protect our waters.

It's interesting that some of the federal investments recently, whether they're investments to the Great Lakes or investments to the Canada nature fund for aquatics, are focused on species at risk and dealing with recovery. Even the recent announcement for the aquatic program was focused on the Great Lakes, St. Lawrence, and the Lake Winnipeg basin.

Those are leaving out a big chunk of Canada. We need to look at the rest of our coastlines and the rest of our waters. 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.

Another action we're calling for is making sure that the regulation, which the Auditor General's report has pointed out, needs to be stronger. It needs 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.

● (1535)

I have a couple of other quick points.

We definitely want to see the financial investment of Fisheries and Oceans focused on those strategies and on those pathways, but also focused on engaging Canadians. Across Canada, whether it's fishing or planting those aquatic invasive species in their water gardens, we can engage Canadians to stop the spread of invasive species.

We were just talking earlier about how, in the west, fishermen can be the first ones who point out.... For example, the northern snakehead fish was first found in British Columbia because of an informed citizen, so we need to engage Canadians in becoming more informed and having the right tools to be the eyes on the ground.

We're calling on Fisheries and Oceans to be the national leader, to be a stronger national leader than they are now and to protect our waters from coast to coast to coast. We want to make sure that the investments are disbursed. We, in a very self-serving perspective, believe that the west needs to be protected. We believe that highly invasive fish, such as pike, bass, etc., are threatening the fragile salmon environment, which is really important to our cultures, both indigenous and non-indigenous. Our coasts are being impacted by aquatic invasives, green crab, tunicates, and I know we share that with the east coast. Those are having a major impact on both our trade and our biodiversity there.

We need to close those pathways. On shipping containers, New Zealand uses shipping containers that are.... When shipping containers come into New Zealand, they have to be inspected, and they have to pay for it. If we can close our pathways as New Zealand and Australia have, that would be much more effective for Canada.

Our council, along with our chapters across Canada, including our Canadian council, are more than willing to work with Fisheries and Oceans on a regular basis.

Thank you for your time.

● (1540)

The Chair: Thank you That was under time, which we don't get too often.

Next I'll try to go back again to the Invasive Species Centre.

I'm not sure who is speaking or if you're sharing your time, but you can start when you're ready. You have seven minutes or less, please.

Ms. Deborah Sparks (Business Development and Communications Manager, Invasive Species Centre): Good afternoon, honourable committee members. Thank you for inviting us to speak.

In 2011, the Invasive Species Centre, or ISC, was formed as a strategic initiative of Fisheries and Oceans Canada, Natural Resources Canada, Canadian Food Inspection Agency and the Ontario Ministry of Natural Resources and Forestry to be a unique example of partnership and a hub for collaboration and knowledge sharing.

Our mission is to connect stakeholders, knowledge and technology to prevent the introduction and spread of invasives in Canada. With partners, we have shared and supported government objectives on aquatic invasive species, or AIS, through a project such as the Asian carp Canada program. We would be very happy to tell you more about our work in the question period if desired.

Since 2011, when we were established, we have seen improvements in invasive species outcomes in Canada, particularly with addressing gaps and reducing overlap. These successes are attributed to intensive collaboration with many partners. Accomplishments have been considerable, but we all still have work to do.

As you know, AIS pose serious threats to freshwater and marine ecosystems with invasive species introductions regarded as the second greatest threat to global biodiversity next to habitat loss.

In the Great Lakes, economic contributions of activities in and around the basin contribute approximately $13.8 billion to the Canadian economy, not including services that are difficult to quantify, such as ecosystem services, biodiversity or cultural importance. Total economic value of activities that could be affected by, say, an Asian carp invasion in the Great Lakes is $8.5 billion a year.

Impacts to water resources of significant value warrant significant investments to protect them, just as we are doing with the research and binational coordination efforts for Asian carps and sea lamprey.

There are also considerable needs across the country, as demonstrated in the case of destructive zebra and quagga mussels. The estimated economic impact of these mussels is in the tens of billions of dollars annually in Canada. Many water bodies in Manitoba, Saskatchewan, Alberta and B.C. are at risk from their spread. If we want to protect Canada's fisheries, we need to act with urgency on threat species, such as zebra mussels, in the ways that we did for sea lamprey in the 1950s and more recently with Asian carps.

For equitable and consistent distribution of resources across Canada, we recommend the establishment of an integrated national AIS program with a transparent and efficient system for screening and assessing risk that will better enable priority setting for funding and action. The program should be based in science and be forward thinking. We should scan the horizon for threats beyond species already on our radar.

Prioritization and resource allocation should relate directly to risk, potential impacts to ecosystems, economy and society. The recent Auditor General's report makes recommendations that will be a useful starting point for a future strategy. With an expected increase in invasions and outbreaks in the future, Canada must focus on a state of preparedness and will require an increase to resource allocation to do this effectively.

Specifically, future strategies and enhanced investments should focus on early stages of an invasion, prevention, early detection and rapid response. 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.

One only needs to consider sea lamprey in the Great Lakes to understand why prevention has a better return on investment than year-over-year control. Binational costs for lamprey were $40 million Canadian last year alone. Existing frameworks such as the Asian carp program should be used as models for other AIS across the country.

We recommend the continued enhancement of coordination to more effectively implement the regulations. The existing regulations already provide a strong policy tool. A national program is needed to build operational capacity to fulfill those regulations. More clarity on responsibilities between jurisdictions can be achieved through coordination. This should include an integrated strategy with our U.S. neighbours. AIS don't see borders and we also need to be border blind. While it's possible to refer to the legislative and regulatory mandate of the lead agencies, in practice, every situation will be unique and there are many factors that will determine how a response will unfold that cannot be predetermined. Bolster a space for lead agencies to collaborate and coordinate.

● (1545)

The recent Auditor General's report recommended that DFO drive this coordination. With DFO's leadership, strategic partnerships can also help fill this need. There are many pre-existing mechanisms, such as the national AIS committee or the ISC, that could be harnessed for coordination. This could also bring clarity to the growing problem of aquatic plants, as responsibility is not always clear at this time.

Finally, increase capacity to implement the regulations by giving enforcers tools. Border and fisheries officers require training. Look to groups like the ISC, which has conducted training for MNRF enforcement and DFO fisheries officers to deliver these services. Add tools to the tool box. A national standard reporting tool would address data gaps and inform planning. EDDMapS is a reporting and mapping tool already used by many states and provinces. We are working with partners to expand it, and we are looking to continue this expansion. A national fund could also be established in collaboration with provincial partners to mitigate delays and support response in an efficient way.

As mentioned, we are doing some things well, as in the case of sea lamprey and Asian carps, but Canada really can't do a great job without a national integrated program for AIS that looks beyond borders. We look forward to working with all partners to continue to address these issues and move the bar forward on aquatic invasive species.

Thank you.

The Chair: Thank you. Again, we're a little bit under time.

We'll go now to Ms. Robyn Hooper, the executive director of the Columbia Shuswap Invasive Species Society.

When you're ready, you have seven minutes or less, please.

Ms. Robyn Hooper (Executive Director, Columbia Shuswap Invasive Species Society): Thank you, members.

The Columbia Shuswap Invasive Species Society, CSISS, is one of 13 regional invasive species organizations in British Columbia, whose mission is to actively prevent invasive species infestations through education, early detection, management and restoration of B.C.'s ecosystems.

Aquatic invasive species, or AIS, pose acute threats of ecological and economic harm, especially in regions where they are not yet introduced. In 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. The ecological harms caused by AIS infestations are substantial as they disrupt aquatic ecosystems and the species that depend on these ecosystems for habitat. We believe the invasive mussel issue is the number one threat to our region and to B.C., and not enough is being done by the federal fisheries agencies to protect our resources.

CSISS works with multiple land managers and stakeholders in the Columbia Shuswap region of B.C. to collaborate and deliver invasive species outreach, prevention and management programs. However, our region sees very little aquatic invasive species federal funding, and this does not seem proportionate to the threat our region faces. At risk are our water quality, water utilities, beaches, property values, fish habitat—resident species and anadromous Pacific salmon, for which our region provides critical migration, spawning and rearing habitat—and our infrastructure. Should AIS establish itself in reservoirs, hydroelectric dams would generate large costs to British Columbians.

If zebra and quagga mussels establish in our region, it is conservatively estimated that it will cost over $43 million for British Columbians and over $500 million for the Pacific northwest economic region to deal with the impacts. These numbers surely do not represent the social and cultural losses should invasive mussels impact Pacific salmon stocks. If mussels are introduced to this region, the impacts will be far reaching and irreversible. The only solution is prevention.

We would like to see more action to close high-risk pathways that introduce and spread aquatic invasive species, specifically the containment of invasive mussels to eastern Canada to prevent their spread to the Pacific northwest, including British Columbia.

Invasive mussels are making their way across North America. British Columbia and the Pacific northwest are the last frontier without invasive mussels. This is an emergency situation, and the federal government's current efforts mean that it is most likely a matter of when, not if, we get invasive mussels in B.C. We need federal support and action on the ground, with 24-hour inspection stations with detection dogs—the only highly effective tool available for invasive mussel detections—and regulations to keep invasive mussels out of B.C., as well as federal regulations and enforcement to contain invasive mussels to eastern Canada.

Continued complacency will irrevocably damage B.C.'s freshwater resources and devastate local economies. Time is of the essence, and these report findings are further proof that more needs to be done by the federal government to prevent and contain aquatic invasives.

On behalf of CSISS, I thank you for the opportunity to provide input.

● (1550)

The Chair: Thank you for that. Again that was under time, which is good to see.

We'll now go to Mr. Bouzan, president of the Newfoundland and Labrador Wildlife Federation.

Go ahead when you're ready, Andrew. Welcome back to the committee.

Hang on, Andrew. There's no sound.

While we try to fix that, we'll go to Dr. Hugh MacIsaac from the Great Lakes Institute for Environmental Research.

When you're ready, sir, you have seven minutes or less. I understand that you have a slide show and that all members have been provided with a copy.

Professor Hugh MacIsaac (Professor and Canada Research Chair in Aquatic Invasive Species, University of Windsor, Great Lakes Institute for Environmental Research): Thank you very much. I appreciate the opportunity to come and speak before the panel. I'm a professor, so I use slides for everything. I have limited it to seven slides here.

With the first two, I simply want to impress the committee on the importance of invasive species as a globally important biodiversity risk. The first slide shows the number of species that have gone extinct since 1500 for five different sentinel groups. They're in blue on the left. In many cases, the sources of stress that caused these species to go extinct do overlap, but if we try to pigeonhole them into dominant and lesser stresses and we go through each one of those, we're going to see that for three out of the five groups, invasive species was the leading cause for species going extinct. In a fourth case, it was the second-leading cause.

We know that historically, this has been a very important mechanism that has caused species globally to go extinct.

Going to the second slide, we're looking at reasons for current endangerment of species based upon United Nations red list data. Red-listed species are those that are considered threatened or at risk of extinction. In the upper panel, we're considering all of the data that they had available to them. The dark bars indicate the importance of that particular stressor for all of the species that are currently threatened. As we already heard, habitat loss is the leading cause of species endangerment today globally, followed by non-native species, various forms of pollution, then over-exploitation, over-harvesting, and finally, disease.

If we look simply at marine systems, things get rearranged a little bit. Over-exploitation, not surprisingly, becomes number one. Invasive species drops to number three, and climate change makes an appearance there. Considering both the species that have gone extinct and those that are at risk of going extinct today, invasive species is a leading global stressor.

The next slide is a look at DFO's funding gaps. From what I see, by reviewing the auditor's data and from what I know about DFO currently, it appears as though the principal effort is devoted to species-based management. Most of that is dedicated simply to the four different Asian carp species.

We've also heard that it's far more effective, and in many cases a lot cheaper, if we instead monitor and regulate by pathways. I'll give you a quick example.

No one had ever heard of the emerald ash borer before in North America—no papers, no talks at conferences on the emerald ash borer—until it came into my backyard, literally two doors down, and it started killing all the native ash trees in Ontario. We had about two billion trees, most of which are now lying on the ground. It's now spread. I know it's in parts of eastern Canada as well, and it's spreading into the western Great Lakes region.

By managing only species, something like the emerald ash borer escaped scrutiny, because no one had ever heard of it. If instead we'd been looking at the pathway that allows a species like that to get in, which in this case was wood dunnage carried by ships, and we'd been effectively managing the wood dunnage, not only would we have stopped the species we know about that spread via dunnage, but we would have stopped this species as well.

Clearly, we need a two-pronged approach. Some of the species we clearly want to manage closely. For other ones, we need to manage the pathways very effectively, because we can shut down a lot of species movement by doing that.

The global ballast water treatment treaty that is in place today was begun a few years ago. It began in 2004, but it wasn't ratified globally until 2017. Everyone thinks this regulation is going to dramatically reduce the number of aquatic species moving around the world via ballast water, but in Canada, we're not doing any formal testing. We have no formal budgets to determine whether or not the risk has dropped as low as we think it has because these ships come in with the treatment systems on board.

Just for our own security, we really ought to be funding at least one major study like that to determine whether or not we're getting the benefit we think we are. Dr. Sarah Bailey works at DFO in Burlington. She has some funding from Transport Canada. She was addressing this with a small budget last year in Vancouver, but it's something that really ought to be done across the country.

Overall, currently, as far as I can determine, there's no ballast water funds from DFO to determine the effectiveness. Very clearly, DFO and Transport Canada have dual missions here.

The other principal vector that allows marine species to move around the world is hull fouling. It's another huge vector, and we're really not paying it the attention it deserves in Canada.

● (1555)

These species not only spread globally on the hulls of ships, but once they're in key ports, we've seen some tragic examples, particularly on the east coast in Prince Edward Island, of where boats moving around on the coastline spread the species from one region to another. It's both an international problem and a domestic problem for regional spread.

As you already heard, if we look at Australia and New Zealand, we see real pioneers in terms of managing this problem. We don't have to reinvent the wheel. We can look and see what risk assessment methods Australia, for example, uses with vessels coming into its ports to determine whether or not hull fouling is a likely problem. If so, they will take action. We should look at those experiences from the few countries that are leading this effort and adopt and modify their procedures.

From what I saw when I read the Auditor General's report, it became clear that only one or two lines in the entire report pertained to the Arctic at all. One of the things we fully expect is this interaction between climate change and the spread of aquatic invasive species. If there is one area of Canada in which we expect dramatic changes, since we already have large temperature changes, it's in the Arctic. We really ought to be devoting more resources than we are right now. Kim Howland is a scientist at DFO in Winnipeg. She is working with citizens in the Arctic distributing water collection kits. They then bring those kits back down to Winnipeg and do eDNA analysis to try to determine what species have their DNA present in the water. Something like this can be very useful, but it needs to be done formally. We should have substantial funding for projects like that.

Vancouver and Halifax are very clearly the two parts of the country that receive most of our shipping vessels, and yet when I was talking with a scientist out in British Columbia on Friday—I don't want to give his identity away in case he gets fired—he said that they have about $70,000 per year for monitoring. I can tell you, and I think you can imagine, that if you are responsible for trying to determine how many species might be coming into your marine waters, it's a very, very challenging task. When your total budget is $70,000, you just won't be successful. When budgets are developed for these types of monitoring programs that the auditor described, we have to make sure that the funding given to them is realistic.

DFO has ramped up funding for the FP program in Ottawa. While very clearly you need a lot of leadership, as we saw echoed numerous times in the Auditor General's report, and a lot of the building blocks for these programs have to be done in offices, particularly in Ottawa, after that's done you have to lead the program out. You need to have sufficient funds across the country. I will come back to my last slide in a moment, but the total monitoring budget for DFO that I could find was about $400,000 per year across the country. It's not a lot of money.

I would make one statement about the Great Lakes. In the past what happened was that the United States and Canada, usually led by Canada, brought in ballast water exchange rules and then ballast water flushing for vessels that didn't have lots of water within them as they were coming across the ocean. It works very well. Canada seems to be taking the lead here. We need to make sure that if we do go to something greater than ballast water treatment—Transport Canada was talking about ballast water treatment plus continued ballast water exchange as a safeguard—then try to get the Americans to implement it at the same time. Obviously, once the species are in the Great Lakes, it doesn't matter if they start on the American side. Eventually they will come over to our side.

I work at a university. Many years ago, when the first Auditor General report was coming out, I was asked to come to Ottawa and speak on whether or not there was sufficient funding available. There wasn't, of course. Shortly after that, I started a DFO research chair with the government. We came up with a national research network that was funded mainly by DFO but also by NSERC, Transport Canada and some of the provincial governments.

● (1600)

We had professors and DFO scientists from across the country engaged in these networks. We did a tremendous number of studies across the country. At that time, between 2005 and 2015, we were the leading country in the world in terms of doing work on aquatic invasive species, all the way down to undergraduate students up through post-docs, and we had industry involved as well. It's something that I'm not asking you to.... Certainly, I don't want to lead something like that again, but I can tell you that it's a very effective way to leverage funding from other sources, as well as personnel from other groups, to work on these issues.

In the second-last slide, we look at environmental priorities. The current government has budgeted $1.5 billion for marine protection and research. In yellow there, I highlight what the funds are expected to work on. I actually applaud this effort. I think we need to take care of our marine coast very closely. Below that, I show what the current budget is. For DFO research, it's at about $400,000 per year, and with $600,000 per year in monitoring and $1 million for Asian carp. There's one thing that appears to have been dropped, and I'm not sure why. There used to be about $300,000 per year for risk assessment. For those types of assessments, if you read the Auditor General's report, a lot of the species that we are thinking about regulating have never had formal risk assessments done for them. That's still needed.

My last slide shows that if we don't fund these issues appropriately.... We can see that we're going to put a lot of money into marine coasts, and we have a lot of spending on climate change. Currently, we do not have a lot of funding on aquatic invasive species. These invaders can come in and undo a lot of the good work that you're doing with some of these other stressors. We have a paper that has not appeared yet, and in that paper what we're doing is looking at these sea squirts or tunicates that are found in a number of environments around Canada. We're projecting their future distribution under moderate climate change. In 2050, there's not going to be any loss of distributions, as shown in green, for these three major biofouling species.

In terms of all of the pictures that I have shown, the one in middle I shot about seven years ago while visiting a mussel farm in P.E.I., so they're already present. What you can see there in red is the projected expansion of the distribution of these species. Overall, what we expect is that these things are going to move north, farther into Canada. We're not going to benefit from the loss of them. If the loss is going to occur, it's going to occur in the United States.

There's a lot of interaction between climate change and invasive species. I would just urge the committee to make sure that invasive species get their due when budgets are considered.

Thank you.

● (1605)

The Chair: Thank you, Dr. MacIsaac.

We'll try Andrew again to see if we're hooked up for sound.

Now that we have you, Andrew, you have seven minutes or less, please, when you're ready.

Mr. Andrew Bouzan (President, Newfoundland and Labrador Wildlife Federation): Hello to the honourable committee members who are here today. I would like to thank you for hosting this meeting. I'm not going to try to rehash a lot of what is being talked about here, but there are a lot of good points coming from the other witnesses who are speaking today.

To start, I suppose I'll highlight the principles of evolution and natural selection. You know of Charles Darwin and Alfred Wallace, the essential people for the idea of a movement to understand the natural world. Both worked alone, separate from one another, in evaluating species and documenting them wherever they explored across the world. These naturalists explored these unknown places of our planet, assessing and compiling data on ecosystems and a wide range of different species in their own distinct ecosystems.

It's no surprise that today, humanity has completely removed any barriers for species to travel across the globe. Over thousands of years we've been travelling and trading, with the 20th century proving to be the pinnacle of global trade, thanks to globalization.

Now, I said I wouldn't try to rehash a lot of what's been highlighted here today, but one of the most important aspects to keep in mind here for invasive species is their incredible ability to survive, even thrive from a single egg to larvals, from two or three. This kind of invasion would be more or less a comparison to a spark in a forest fire, or a single match in a forest fire, and see the impacts of that not only short term but long term. Some of these impacts are not possible to come to terms with and solve, more or less.

Successful aquatic invaders have been moulded by evolution over time. They're very skilled opportunists. They have patience and timing to germinate from their dormant extended periods of time, given their environments in which they're found. Being transported across the oceans, for instance, in bottoms of ships' hulls, with vastly different environments, vastly different temperatures and food supplies, these species that survive these journeys most certainly show us the resilience and the tenacity for them to thrive in other environments. They are most certainly a danger to native species and native ecosystems wherever they find themselves. It's global climate change, the ocean acidity levels, temperature fluctuations. Invasive species are essentially a biological pollution, in whatever ecosystem they find them, to native species and to ecosystems as a whole.

The solutions to deal with this are quite often the preventive measures. We need to assess this early on. Then we need to have a very rapid response if we find invasive species. They have the potential to cause irreversible harm and destroy and eradicate entire environments, whether we are talking about marine environments or freshwater environments. You can look at kelp in different places, or seagrass, and the impacts they have of out-competing the native species, and on a larger scale, the economic impacts. This will have a long-term impact for industry across the country. There are millions and billions of dollars in damages that can be prevented here if the right amount of money and resources are allocated, and there is a vision and foresight to ensure that our coastline....

I completely understand we have quite a large coastline in this country and the largest in the world. But to have the lion's share of money allocated toward two specific species in this country.... Ontario gets the lion's share of all of this money. There's no doubt there. It's going to sea lamprey and Asian carp in the Great Lakes, and for the Great Lakes Commission. It is an important matter, no doubt. The Great Lakes are very important to both Canada and the United States. However, the funding allocated to the rest of the country is almost nothing.

For instance, you can look at five or six species found in Newfoundland and Labrador. Now the European green crab would probably be the top one, and this is probably the most talked about, especially in the commercial fishery. Then you have the oyster thief, which is found just about everywhere across the province. It showed up in Atlantic Canada around the early 1990s, and then 20 years later it stretched for more than 445 kilometres of coastline. Then you have the vase tunicate, the violet tunicate and the coffin box. For most of these species that I'm talking about, it was roughly in 2009, 2011 and 2012 that there was something last done, as far as I'm concerned, with respect to the Department of Fisheries and Oceans. Even besides that, it was about 10 years that the provincial government addressed aquatic invasive species here in the province, or invasive species in general.

It's a very big concern for us here in the province, and it should be a concern for every province and territory in the country. There's the damage to natural habitats and the long-term impact that this is having is that it's displacing native species. It's pushing them out. It's making them compete for the resources.

● (1610)

Every time I or someone from my organization gets the chance to sit down with the Department of Fisheries and Oceans, funding increases are always a key aspect. We want to see more science done. We want to see, most importantly, assessments done in key areas of the province. I can think of 174 scheduled salmon rivers in this province that I would very much like to see some evaluation done on, the estuaries in particular, looking at the health of those systems, and having an ecosystem-based approach. It's crucial for us not to ignore these issues.

I think that today we're left with a long list of failures from all previous governments on the federal scale. I would hope that the Department of Fisheries and Oceans in Ottawa realizes that we could be, or we should be the leaders in wildlife conservation environmental management for the world. We have the second-biggest country in the world. We have 35 million to 36 million people. We could be the stewards of this vast resource that we have.

Quite frankly, I don't see anything coming from the Department of Fisheries and Oceans to help out, to add additional funds, to add enforcement, or to add research. Here in the province, for instance, we're afraid that our wild Atlantic salmon stocks are going to be put at risk and that we might lose them in the future. This is the last stronghold for wild Atlantic salmon in North America. If their habitats, if their ecosystems are put in jeopardy from aquatic invasive species, then we could lose them. Not only that, we could lose a wide range of other biodiversities in this province and across the country.

Biodiversity is one of the most important things that we can keep in mind globally. Habitat loss is number one on the list of things that threaten and put at risk the health of our ecosystems. Aquatic invasive species are quite close to that, depending on where they're found and depending on what they can do over time.

Thank you.

The Chair: Thank you, Mr. Bouzan.

Last, we'll go to Dr. Warwick Sears, for seven minutes or less, please.

Dr. Anna Warwick Sears (Executive Director, Okanagan Basin Water Board): Thank you for inviting me to appear as a witness.

I was asked to say something about my background. I have a Ph. D. in population biology from the University of California, and my research was focused on factors that lead to the spread of invasive species. However, I have been working for the Okanagan Basin Water Board for 13 years. This is a local government watershed agency that has provided leadership on water in the Okanagan since 1970.

We are funded entirely through local property taxes. The water board has been running a program to manage invasive Eurasian water milfoil since the early 1970s, covering the entire costs with local tax dollars since 1992.

In the winter, we use shallow-water Rototillers to kill the milfoil roots while they are dormant. In the summer, we can also do a limited amount of cosmetic harvesting in areas to cut the growing weeds we cannot rototill, much as you would an underwater lawnmower. This is a management program. I run a management program. It has to be done every year, throughout the year, because once established, the weed can't be eradicated. We've had this weed for 40 years now. Our budget for milfoil alone is $850,000 annually with no senior government support.

You might have visited the Okanagan with your families, maybe for a summer holiday to enjoy the turquoise water of our lakes, to play on the beaches and to drink wine. The local first nations consider the Okanagan lakes to be sacred and are in the process of restoring the biggest run of sockeye salmon in the Columbia basin, making up more than 80% of the sockeye in the entire Columbia River system. Most of our drinking water comes from these lakes. We live around the lakes, we live in the lakes and we're famous internationally as a tourist destination because of the lakes.

Our communities are some of the fastest growing in Canada. People want to live, work and establish businesses in the Okanagan because of the beauty of the lakes. We are a water-based economy. Everything depends on keeping these water sources clean.

Ironically, the beauty of our lakes makes them especially vulnerable to aquatic invasive species as boaters come from all across North America to enjoy them. After climate change, aquatic invasive species are the single largest threat to the economy of the region. We've been able to self-fund this milfoil program because of its value to our communities. If we are not able to keep the beaches and waterways clean of rotting weeds and protect the quality of our water, we lose a significant aspect of our quality of life.

Right now, our ability to control milfoil is being threatened by a proposed endangered listing of the native Rocky Mountain ridged mussel. Although it is thought to be relatively abundant in the system and lives throughout the western United States, the Okanagan is the only place it occurs in Canada. The listing would effectively end our rototilling program and our control of milfoil. We are in the process of seeking an exemption under the federal Fisheries Act to allow us to at least keep the public beaches and boating areas free. We believe that the native mussel and our milfoil program can coexist.

I include this in my testimony because it's an example of what can happen if we don't stop the spread of aquatic invasive species. It will be extremely costly and much less effective to manage this weed if the native mussel is listed, and there will be no support or compensation from senior governments for all we will lose.

If barriers to the transport of aquatic invasive species had been in place in the 1970s, there would be no conflict between managing the native mussel and the invasive milfoil, and the local communities would not be spending $850,000 a year on the program.

This brings us to the worst of all aquatic invasive species threats to the Okanagan: invasive zebra and quagga mussels. Because our waters are warm and rich in calcium, we are thought to be among the most vulnerable areas in Canada to these invasives. When and if they arrive, the invasive mussels will breed rapidly. They will cover our beaches with sharp shells, crust the docks and bridges, clog the more than 1,000 municipal and private water intakes and irreparably harm the environment, including the native mussel and our salmon restoration.

● (1615)

Several years ago we did a study that projected the economic cost to be upwards of $40 million a year for the Okanagan alone. This included infrastructure impacts, losses to fisheries, tourism and property values.

The U.S. government is matching millions of dollars each year to the western states for their mussel prevention programs. The Canadian government has mostly given responsibility for preventing this threat to the provinces and dedicates only a small portion of the federal budgets for aquatic invasive species management to invasive mussel prevention.

ln the Okanagan, each year we are spending more than 75,000 of local government tax dollars for public awareness campaigns and to support monitoring, but we have no power, funding or jurisdiction to run inspection programs or to create a strong perimeter defence, which would probably be best established in Saskatchewan, or to ensure that CBSA officers are fully trained, committed and on task at all border crossings from the U.S.

While we greatly appreciate the $800,000 over three years that B. C. received in 2018 for preventing zebra and quagga mussels, it is less than a third of what we spend annually just on milfoil control just in the Okanagan.

This is an issue that should rally members of Parliament from all parties. Canada is one of the most freshwater-rich countries in the world, but we cannot take it for granted. This is our heritage. What do you value most? After public safety, British Columbians value our clean, healthy waters. Everything depends on it: our drinking water, our economy, our quality of life, our environment, even Okanagan wine.

Our experience has shown that once an aquatic invasive species has arrived in an area, they are next to impossible to eradicate, and it is an endless and expensive effort just to manage them. Not only is it more costly to manage invasive species than to prevent them, what we lose in the process can often never be replaced.

Thank you.

● (1620)

The Chair: Thank you for that.

Thank you to all of our witnesses for their presentations.

We'll go into the question round now. Members, just a reminder that if you want a question to go to a person appearing by video conference, please identify them in your question as it's a little harder for them to be recognized.

To the witnesses by video conference, if you want to add something to an answer that somebody else has given on a particular question, wave or something, and hopefully the person asking the question will see and recognize you as well.

Now on the government side, we'll go to Mr. Rogers for seven minutes or less, please.

Mr. Churence Rogers (Bonavista—Burin—Trinity, Lib.): Thank you, Mr. Chair.

Welcome to all of our guests on video conference and here in the room with us today.

I have a couple of specific questions that I want to direct to Mr. Bouzan, because, of course, Placentia Bay is included in the riding I represent in Newfoundland and Labrador. I've heard much discussion about green crabs and the challenge.

I want you, Mr. Bouzan, if you could, to tell the committee how these green crab arrive in a province and how they have become a major problem for us and the fishing industry particularly. Do you have any recommendations as to how we would deal with that species in trying to control it or eradicate it?

Mr. Andrew Bouzan: Thank you for your question. On green crab introductions in Atlantic Canada and this province, I believe it was in the late 1980s when it was first found. Am I still being heard?

Mr. Churence Rogers: You're good, yes.

Mr. Andrew Bouzan: Green crab was found in the Maritimes in the late 1980s. In terms of the abundance of this green crab, first of all, when it was found, it took about a year for DFO to make a plan or to take action on it. Quite frankly, that is a crucial window of time and another perfect example of the problems that the Department of Fisheries and Oceans has. The rapid response that could have been taken here to protect this species would have been a very good management protocol.

That said, green crab in itself isn't necessarily just green crab. If you've seen them up close, probably the closest thing you can recognize them to is a rock crab. There are very fine distinctions that you'd be able to see between a rock crab and a green crab, specifically at the front of them, because they come in many different colours.

Over the last number of years, the commercial fishery has tried to address this and tried to take some out. As I'm sure you're aware, Bay St. George is another key area in which they're found, outside of Placentia Bay. There are key areas or key pockets in which they're found, especially in the northern part, in regard to Placentia Bay.

I believe a number of different measures could be taken to address it. However, unless the Department of Fisheries and Oceans is willing to allocate more funds, is willing to try to look into new technology and new surveys and look into new ways to physically take those crabs out of the environment and then assess whether they need to block off key areas and map out what they're going to do, it's going to take some time. It's definitely going to take considerable time, but in the long term, they've been here for quite some time and as much as I'd like to see them removed and gone, it would have to be in collaboration not only with the Department of Fisheries and Oceans, but with the commercial side of stuff, and even getting the locals involved in this, too.

In terms of what money you can allocate towards that, outside of volunteers going out and trying to take them out themselves, citizen science is pretty good. If you go to areas between Memorial University and the marine institute here in the province, for people who scuba dive, who even do it recreationally, that would be a great start.

● (1625)

Mr. Churence Rogers: Mr. Bouzan, thank you for that. I want to get on to another question now.

Dr. MacIsaac, you've talked about monitoring and regulating pathways. I know species such as zebra mussels and Asian carp have become a large problem in the Great Lakes. How do you deal with these species when they're often transported by transatlantic ships? Is there a way to prevent them entering our ecosystem?

Prof. Hugh MacIsaac: You have to find out how they're moving around, and in the case of the green crab, we think they arrived in Newfoundland via ballast water. Many of these species produce larval stages that are microscopic and they would be picked up probably on the eastern seaboard of the United States and then transported elsewhere.

In the Great Lakes, our problem is mainly a European one. Historically, we have ships that were picking up ballast water in major freshwater ports such as Rotterdam and Antwerp and coming across the ocean. A study for Environment Canada in 1981 indicated that we were going to get invaded by zebra mussels. They misspelled the name, but they said we were going to get invaded by zebra mussels if we didn't do anything. Fast-forward six years and we have zebra mussels.

Thus, you have to control the vectors. We've heard this a couple of times here, and I want to put in a plug for DFO. There is a very clear need to stop the western spread of zebra mussels. 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. Make sure that people are not bringing boats out of those systems and moving them west. It's going to be a lot easier to manage the problem there than trying to manage it once it starts spreading to many systems.

In Ontario, zebra mussels are in so many lakes that all you can do is stand back and watch. You can't do anything. However, when you have only one or two systems that are invaded, you can quarantine those systems. It's the most effective way to prevent the western spread of these animals.

Mr. Churence Rogers: Ms. Wallin, is that part of your strategic approach in terms of working collaboratively with different groups and organizations at different levels?

Ms. Gail Wallin: Absolutely. Talking about preventing mussels is one tool, so we work with organizations to do clean, drain, dry—making sure that boaters clean, drain, dry. The regulations need to enforce that.

It's not just Winnipeg. We also care about Ontario's boats' being decontaminated before they're allowed to leave Ontario because that's where most of the infested boats that are coming into British Columbia are from.

Our organization works with government and others. We don't have the enforcement tools—we're outside of government—so government needs that investment with the federal government to protect those borders. Maybe it's not 24-7. Maybe there are rules about when boats can come into the province and about making sure that they're clean before they come in.

We think there's a big role for citizens, picking up on Newfoundland's point, with regard to making sure that citizens are aware and watching. We know that citizens, if they know what's coming in or what could come in, can take the right actions to make sure at their local boat launch or their local lake that people are adopting it. They can make sure that no one brings it in on a boat from Ontario because they don't want it in their lakes. They can actually help contain it. We think there's a huge role for Canadians on that. We see it in a lot of other areas.

● (1630)

The Chair: Thank you, Mr. Rogers.

Now we go to the Conservative side.

Mr. Arnold, you have seven minutes or less, please.

Mr. Mel Arnold (North Okanagan—Shuswap, CPC): Thank you, Mr. Chair.

Thank you to all of the witnesses. There's quite a group of you today. It's good to see that this is an important study to you as well.

My background with regard to invasive species goes back a number of years to perch, bass and pumpkinseed fish that were planted in our local, small fishing lakes and basically destroyed the ecosystems in those lakes. Luckily, they were small systems. We were able to treat them with rotenone and restore them to the balance that was there prior to that. However, we're now talking about much bigger systems: the Okanagan system, the Thompson or.... The entire Fraser system is a big part of my riding of North Okanagan—Shuswap, so I want to make sure that we can do whatever we can.

My concerns are around making sure that the resources are there so that we can effectively prevent infestations. We've seen the Auditor General's report and the diagram in there that shows the cost of prevention being so minuscule compared to the cost of eventual treatment years down the road.

Along those lines, Mr. MacIsaac, Ms. Wallin and anybody else who wants to quickly chime in, do you see clear mandates for the responsible ministers, whether they're federal or provincial, for protection against aquatic invasive species in the way of protection for fish stocks and other ecosystems dependent on it?

Mr. MacIsaac, would you like to start?

Prof. Hugh MacIsaac: Yes.

We think, but we're not sure, that ballast water is not going to be a problem going forward. We need to test that to make sure that that's the case. Hull fouling is an issue, particularly on the two coasts. We don't think it's a problem in the Great Lakes.

The live trade is another area that I think is emerging as a dominant problem. There are a lot of species—both animal and plant—that are sold in pet stores around the country that could pose significant problems for the systems if they were to get out.

I know 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. Somewhere along the line, the federal government.... Of course, before you can ban a species, you have to do a risk assessment, and it's the federal government that would do these risk assessments. We've done them for Asian carp and for some other species. The federal government would be asked by the provincial government or by the citizens: “We want to protect our resource. Please do a risk assessment to determine if it can get here and if it will cause harm if it gets here.” If the answer to both of those questions is yes, then the provinces should be acting. Ideally, they're going to act in concert with the federal government—DFO in this case.

Mr. Mel Arnold: Okay.

Ms. Wallin.

Ms. Gail Wallin: Absolutely. There's an absolute need to have more resources dedicated to protect our waters, and not just specific rivers. With regard to the point about there being authority, there probably needs to be stronger leadership at both the federal and provincial-territorial levels so that the lists aren't just by species, but close those pathways. You've given some good examples.

Whether we're trying to protect the Fraser or the Skeena for salmon, we don't want boaters moving milfoil. We don't want them moving mussels. We can do a lot by getting our key audiences better educated.

I have a couple of other things. One, just to build on the authority aspect, is with regard to the federal government, and not just DFO. DFO would need to work really closely with Environment and Climate Change Canada and the CFIA on something like a common database. Right now you can't figure out where zebra mussels are or where milfoil is in Canada. There isn't a common database that I, as a citizen, can pick up, access and engage my fishermen friends with to make sure that we protect our waters. It's important to look at that and engage our citizens, absolutely.

Mr. Mel Arnold: Okay, thank you.

Dr. Anna Warwick Sears: Let me just say that there are some laws in place, of course, at the federal and provincial levels to stop the spread of invasive species, but if people are not enforcing the laws, if they only have part-time or part-year inspection stations, although it's illegal to bring invasive species to B.C., they are still going to spread unless there are officers out there actually stopping people.

Mr. Mel Arnold: Thank you.

Mr. MacIsaac, you talked about addressing the vectors. It's like a disease, basically. You need to quarantine to stop them. We've seen that the inspection stations that have been set up in B.C. have definitely stopped infected or infested boats and watercraft from coming in. These are not, however, on every point of entry.

Do you feel that they're sufficient and that they're manned for sufficient hours, and is the training in place to make sure that those inspectors...?

● (1635)

Ms. Gail Wallin: I feel pretty comfortable answering that question for western Canada. I think there's consensus across governments in western Canada and among the citizens that no, those aren't sufficient. There are many ways that boats could still get through the network into the western provinces.

There needs to be a different approach. You might not, as a federal government, be able to support the 24-7 model, but perhaps boats can only enter at certain times of the day or can only enter through certain ports. Those kinds of provisions are very common for the agriculture sector. You can't ship horses and cattle at whim; there are rules that apply.

We can, then, look to other industries. The bottom line is, keep them in Ontario, keep them in Winnipeg, and then fewer inspections are needed in B.C. or Alberta or wherever.

Prof. Hugh MacIsaac: Let me make one point. The auditor said that in many cases we have a blurred distinction about whose responsibility it is. Is it provincial or federal? We have some cases that we can look at, an example being an outbreak of whirling disease in Banff Park a couple of years ago. The reason you need to have the lines clear from the start, as well as budgets in place, is that when you get a call....

That is the most tragic example. If we could turn back the clock five or seven years and say that we don't have the disease here—and it's a devastating disease—and if we had clear lines of authority and found a single occurrence of this thing, what would you do? I can tell you that the most prominent conservation biologist in the world, in my opinion, a guy named Dan Simberloff, says that to him it's very clear what you do: You take whatever tools you have in your tool box and you get out there and address it now, because if you don't address it now, you won't have an opportunity in the future.

If that means poisoning a lake, particularly a small lake.... No one wants to poison a lake—that's not why we're in the business—but you have to look at relative harm, and you say, if we can stop this invasion of a highly deleterious organism in this system, we can keep it out of not only western Canada but out of Canada—certainly out of western Canada.

Mr. Mel Arnold: I think I'm out of time.

The Chair: Yes, you definitely are. Thank you, Mr. Arnold.

Now we go to Mr. Johns, for seven minutes or less, please.

Mr. Gord Johns (Courtenay—Alberni, NDP): Thank you, all, for your testimony. It's incredibly valuable.

I'll start with Ms. Anna Warwick Sears.

You talked about funding earlier. Can you give me the percentage breakdown of what you get from DFO and what you get from other agencies and local and provincial sources? Is there a rough idea?

Dr. Anna Warwick Sears: Yes. We get "this much" from any other level of government.

Mr. Gord Johns: So it's zero from Ottawa?

Dr. Anna Warwick Sears: It's zero from Ottawa, zero from the province. All of our funding is from the local property tax base.

Mr. Gord Johns: I'm from Vancouver Island. I was just in the House of Commons raising concerns about getting money out the door to help local community groups that are there on standby wanting to contribute to help with restoration enhancement and habitat protection projects.

Can you talk about how much the funding is leveraged at the community level, when you get money from Ottawa?

Dr. Anna Warwick Sears: Well, I can't talk about it for invasive species, but I can certainly talk about it for a lot of other projects we're working on. For one of the other biggest projects we get, we get some external project-based grant funding from senior governments for things such as flood mapping, and we've been able to leverage federal dollars through the national disaster mitigation program to get the entire valley flood mapped. That will end up being about 40% of the cost.

Mr. Gord Johns: Right.

Can you go into a bit more detail about collaborating with officials in Washington state to protect vital species like our sockeye, and the importance of that?

Dr. Anna Warwick Sears: Yes. There's some really inspiring work that's going on.

One of my other hats is that I'm on the IJC's International Osoyoos Lake Board of Control, and we're working on managing the waters coming out of the Okanagan into Washington state. One of the things we manage them for is specifically to ensure there is enough water in the Okanagan River going into Washington state to support the returning sockeye.

We don't have a federal obligation to provide water to the United States, but everyone—the tribes in Washington state, the first nations in the Okanagan, the settlers in Washington state and the settler communities in B.C.—is completely supportive of the restoration of the sockeye. A lot of the funding for doing the sockeye restoration comes from the hydro systems in the United States, which are doing it as a way to support their obligations under the Endangered Species Act.

We have big restoration programs happening in the Okanagan that are supported by the Americans, because they see us as a way to support.... Because of the pristineness of our system, because we don't have zebra mussels yet, we are able to be the natal streams for the sockeye restoration. They're also bringing back chinook and steelhead.

● (1640)

Mr. Gord Johns: We know how much they're under threat now, and the salmon certainly don't know borders. They're important to both sides.

Would you be able to work more effectively with them if you were given more resources? How would that help you, to be given resources from Ottawa, say, toward more collaboration?

Dr. Anna Warwick Sears: There is so much work that needs to be done on stream restoration in the Okanagan. Most of those ocean-going salmon are river or stream spawners, and there is a lot work that needs to be done to bring those streams back and to improve the habitat. A lot of our habitat was channelized.

Mr. Gord Johns: Do you work closely with an aquatic invasive species program officer in the region? How many are there in the region?

Dr. Anna Warwick Sears: In the Okanagan, the Okanagan and Similkameen Invasive Species Society is the group that's on the ground. We provide a good chunk of their funding. They have a few different funding sources, including the Habitat Conservation Trust Foundation.

We have them under contract for $30,000 a year to do monitoring and outreach at the boat launches. That's part of the funding that we spend every year. That is local property tax funding, because this local invasive species society didn't have enough money to fund people to go out to the boat launches and talk to people. They literally didn't have enough funds, so we had to work out this arrangement and dig into our own budget because there wasn't enough support.

Mr. Gord Johns: Salmon is a billion-dollar industry in British Columbia so that's pretty scary.

Mr. MacIsaac, can you speak a bit more about how DFO used the work of the Great Lakes Institute for Environmental Research and your work to better address invasive species in the region? You talked a bit about that. You talked about the need for funding. You outlined some of the costs related to it.

How much do you need? You also cited some good models, like Australia and some other places that are doing great work. What are the needs? What would be adequate?

Prof. Hugh MacIsaac: Well, not only with aquatics, but with our forestry sector and agricultural pests, you want to keep those things out as well. There are innovative ways to test to see whether or not we have problems. We do a lot of work with environmental DNA. As an organism swims through the water, it ends up excreting and some of its DNA gets left behind.

We have found it very cost-effective to be able to collect water samples. Once you have a DNA, a particular gene that you're targeting which is specific for that species, you just collect water samples and analyze that water for environmental DNA. In an ideal world, you can do this for a whole ensemble of invaders, all using different genes. Then you can map that onto what we call a gene chip, and using a single gene chip, you could simultaneously check your water for the presence of maybe 30 or 50 invaders all at once.

Now, there are going to be significant start-up costs to do that, but once that's been done, the costs drop to very, very low amounts per sample—perhaps $20 or $30 per sample. You can do screening of DNA, which is about four orders of magnitude more sensitive than using traditional methods, where we go out with a net, and you hope that if you have an invasive fish, like the fish we had in British Columbia a few years ago, it makes its presence known by swimming into your net or into a camera field or something like that.

● (1645)

Mr. Gord Johns: There must be countries investing in this kind of infrastructure because they understand the threat to their economy. Can you name a couple?

Prof. Hugh MacIsaac: Australia and New Zealand, Australia, in particular.

The Chair: Thank you, Mr. Johns. You're over time.

We go back now to the government side.

Mr. Morrissey, for seven minutes or less.

Mr. Robert Morrissey (Egmont, Lib.): Thank you, Chair.

I want to follow up with Mr. MacIsaac on my colleague Mr. Johns' question.

How do you define significant start-up costs? It sounds like a fascinating area. A global G7 nation like Canada should be looking at this area. We pride ourselves in science, and growing science.

Prof. Hugh MacIsaac: We talk about the issue of sensitivity. If I'm going to use a DNA marker, how sensitive is my DNA marker to the presence of low amounts of DNA of that species? We have thousands of genes in our DNA, and you have to select the right gene. We know from previous work which genes we should be looking at. Then within those genes you need what are called primer pairs. Primer pairs allow you to bind onto the DNA. Each primer pair is going to have different sensitivities. What you have to do in the lab for each species, you would have to test different genes and different primer pairs for each gene to determine which of them had the most sensitivity. They could vary up to seven orders of magnitude. We're talking a vast difference in the potential use. You then pick the ones that have the highest sensitivities. That means they are best able to find DNA of a species when it's present at minute quantities in the environment. This is where the significant start-up cost is.

Of course, you have some machinery that you have to get to do the work. For each of the species that you're concerned about, you have to do some significant lab work in order to determine which gene you are going to go forward with in the future. It's going to be different for every species that you choose. Once it's been done you would publish this stuff in public databases, and everyone else in the world would be able to use that same gene and that same primer pair into the future.

Mr. Robert Morrissey: That sounds fascinating. A lot of it was over my head, on the DNA match.

Prof. Hugh MacIsaac: We've tested a couple of other things. We had automated camera systems where you have a flow field. If an organism is present in that flow field, you interrupt the light through it. Based upon the pictures that you get from that, you can try to match a library of images to what you're getting. We found that system did not work well. For zebra mussels they also have a larval stage called a veliger larva, which is very small. It has a unique property that if you hit it with polarized light, you get a star pattern or a cross in your field. When you're looking under a microscope, typically most things look more or less the same, but if you are using this polarized light technique, then if you have these veligers present in your sample, you will see these crosses, and they stand out.

We found that is a very effective way to find if you have them.

Mr. Robert Morrissey: I have a specific question. You referenced Prince Edward Island. We do have tunicate. One of the concerns that comes from the industry as a whole is some of the preventive methods they're using are causing issues with some of our other commercial fisheries. For instance, the lobster fisher is not happy spreading lime to control the tunicate. You seem to have done a lot of research. Over the past 10 years, have we seen an acceleration in invasive species dominance? Is it stable across the board?

Prof. Hugh MacIsaac: Just in P.E.I. or in Canada?

Mr. Robert Morrissey: Just in Canada.

Prof. Hugh MacIsaac: No. We continue to find new species in most places where we're looking. It's a real problem that we have. If you don't find any new species in the Great Lakes, is it because we've stopped the problem or we've stopped looking for them?

What you want is a standardized search effort through time—

Mr. Robert Morrissey: —which is what you referenced, because the costs are very quantifiable after the fact. We're all seeing it.

Another comment is that in agriculture, and P.E.I. in particular is very sensitive to that, when a disease or invasive species is detected, there's a very stringent protocol that comes into place to move on it. For instance, farmers have to spray to disinfect their farm implements, just simply going from one field to another of theirs. They have some really rigid protocol and regimes in place in the agricultural sector to prevent the spread. It appears we're not doing that within the water system.

● (1650)

Prof. Hugh MacIsaac: I think there was a trial and error period in P.E.I., particularly with moving aquaculture species around, and at first, people didn't realize they were going to be the pathway that was going to move the species to another bay. I think that phase we've passed and people now recognize that both equipment and boats that they're using can move these species around. I know when we're sampling, we have to be very careful as well. We either sterilize our nets if we're going between systems or we just use different equipment in different areas.

If we're moving the actual stock, that poses a huge problem, because these things have a huge surface area, and a lot of these nasty critters that we're talking about, these tunicate species, are ideal. They hunt for substrates like that to settle on, so it's not surprising that we see a huge problem in the aquaculture industry, particularly with the mussel culture.

Mr. Robert Morrissey: Ms. Wallin, do you want to comment?

Ms. Gail Wallin: I'd like to comment, but you're right that we don't have that standard. In the agriculture industry, there are lots of practices that we've learned because we want to protect our economic value and the health of our.... We're just starting to get there in the aquatic area. Whether it's ballasts or shipping containers, there are all sorts of ways invasive species are accidentally introduced. Boaters, fishermen, could potentially be protectors of our water if they were trained and given the right tools. We don't have those standard practices yet.

In B.C., we're piloting a new project called invasive wise marinas. Marinas are a really common source for boaters, so if they can take that leadership role voluntarily.... Those are the kinds of tools that are in place.

You mentioned the pet and aquarium trade. I'll close by saying that many of our aquatic invasive species are introduced unintentionally when someone dumps their aquarium, etc. We can change those practices, but it takes the engagement of citizens.

Mr. Robert Morrissey: I have a quick question for Mr. Bouzan from Newfoundland.

You referenced natural evolution as a control methodology or the reason we are now seeing more invasive species.

Mr. Andrew Bouzan: I was strictly refreshing a bit of history on how the world used to be before 90% to 95% of all trade on earth became marine. Between the ballast waters and the antifouling, it is virtually accessible to any species around the world. Unless strict measures are put in place to prevent the spread of species latching on to hulls or finding themselves in the ballast waters, then any place will potentially be a new home, given that they're there.

This approach has been taken in a variety of ways to reduce or stop transfers of aquatic species across the world, including having toxic substances put on hulls of ships, which we know is now banned. I know the United States back in 2001 required vessels to release ballast waters at sea before getting into coastal waters. That's a key aspect to preventing aquatic species from getting into coastal waters.

I read something a while ago about using heat or UV light within the hull of the ship to try to destroy or kill undesired species. You can also coat the vessel's hull with a non-toxic layer of vinyl resin, I believe, and then reinforce that with glass and it will reduce not only the drag on the ship itself but also the ability of fouling species to actually get onto the ships themselves. I believe that was through Hydrex underwater technology.

The Chair: Thank you, Mr. Bouzan.

We go now to the Conservative side, to Mr. Arnold again, for five minutes or less.

Go ahead, please.

Mr. Mel Arnold: Thank you, and if I have some time left, I'll share it with my colleagues, if possible.

I'd like to shift back to the actual study motion and what we're looking at here, which is to examine “the Department's resources dedicated to identifying and eliminating aquatic invasive species... 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”.

Getting back to the mandates and so on, is there a clear jurisdictional mandate between the provinces and federal government? Answer quickly if you can, because I have a whole series of things I want to get through here.

Mr. MacIsaac.

● (1655)

Prof. Hugh MacIsaac: I'm not sure. I would say that in most cases, there probably is not.

Ms. Gail Wallin: I would second 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.

Dr. Anna Warwick Sears: I'd sign on to that as well.

Mr. Mel Arnold: I saw nods from most. Is there anybody who disagrees?

Okay, great.

We have people from different parts of the country here. We've seen significant funding going to the Great Lakes for the sea lamprey and Asian carp. Are those funding levels effective? Is there anybody who can speak to whether those programs on the sea lamprey and Asian carp are effective ?

Mr. MacIsaac.

Prof. Hugh MacIsaac: With the sea lamprey, the U.S. and Canadian governments monitor lamprey abundance annually. You can see there's a very significant reduction associated with this expenditure.

It's money well spent, but it's the type of thing where you're spending it for the rest of your life. We can't get them out.

Mr. Mel Arnold: Yes, and that's what we've seen, again, with the Auditor General's report. You're probably better off spending a few dollars on prevention. I liken it to immunization against measles and other communicable diseases.

What are the risks if we carry on at the current levels of funding?

Ms. Warwick Sears.

Dr. Anna Warwick Sears: I think I presented on it.

I thought about the statement I made, that after climate change, aquatic invasive species are the biggest threat to our regional economy. I asked myself if that was a true statement. I really believe it is.

People really come to the Okanagan for the lakes. Our entire economy is built around the lakes. It's all about the lakes—our drinking water systems, everything.

We will lose our whole community and our culture if (a), we cannot control Eurasian water milfoil and (b), we get invasive mussels in there. The reason we're so vulnerable to invasive mussels is that we have so much calcium in the water it will make them grow faster and breed faster. All of our infrastructure is in the lake.

Mr. Mel Arnold: Thank you.

Ms. Wallin, what levels of federal resources come into your programs in B.C.?

Ms. Gail Wallin: I'll speak to B.C., but I also work with chapters across Canada. We get other federal funders, such as Environment Canada, but basically, as a provincial organization, we don't get any funding from Fisheries and Oceans.

With respect to the question that was asked earlier about leveraging, we can usually leverage a 1:2 to a 1:4 ratio from the federal government.

DFO right now is a zero funder. You haven't had that model. It needs to be there.

Mr. Mel Arnold: Mr. MacIsaac.

Prof. Hugh MacIsaac: I'd like to go back to your previous question.

In most cases you see a tight coupling of the number of invaders in a country and the size of that country's economy. The more you trade, the more invaders you get.

Many years ago, Herb Gray was the member of Parliament in my area. He asked an interesting question about zebra mussels. He asked why we are only getting zebra mussels now and not 50 or 80 years ago, because we've been trading with Europe for a long time. What you have to realize is that these species are not only spreading here, but they're spreading there. In this case, once these key invaders got into the northern European ports with which we have a lot of ship traffic, we had them come over. If you look at both terrestrial and aquatic ecosystems around the world, you'll generally see a curve like this. I have seen very few cases where it levels off, but that's, of course, what we're trying for.

Mr. Mel Arnold: Thank you.

Quickly, vo you see a balance in the federal funding that's out there? If you're seeing none, maybe there isn't any balance.

● (1700)

Ms. Gail Wallin: I have to say there isn't the balance and there isn't the investment in prevention that there needs to be. Those two things need to be addressed.

Mr. Mel Arnold: Okay.

Who else do we have out there? Mr. MacIsaac—

Prof. Hugh MacIsaac: My second-last slide addressed that. I think it's a very—

Mr. Mel Arnold: Thank you.

Mr. Bouzan, on the eastern side of the country, what have you seen in the way of federal funding to address invasive species in Newfoundland?

[*Technical difficulty—Editor*]

Mr. Martin Shields (Bow River, CPC): —dogs are incredible at the border. In two minutes they can inspect any boat. People take a lot longer. They're not as invasive. We have them at two border crossings. Our boats come from the south. We get one Sea-Doo coming in a trailer and we're done in Alberta and you're done in B.C. because the boats go north and south. There were zebra mussels last year in Montana. It's coming.

Unless the agricultural sector gets together here, Lawrence MacAulay says we're going to go $15 billion more. In my area I've got the largest irrigation district, so you produce 20% of the agricultural product. They're all pipes. They're all pivots. That industry will be gone with invasive species.

People have to understand invasive species are a national issue. Unless we do it with money federally, we're done.

Dr. Anna Warwick Sears: In the Okanagan we're thinking of having a GoFundMe campaign to get dogs. That's the level we're at.

Mr. Martin Shields: They're fantastic. The dogs at the border crossings don't bother people. They'll inspect the boats in two minutes—two minutes for an invasive species.

The Chair: Thank you, Mr. Shields.

Now back to the government side.

Mr. Finnigan, you have five minutes or less, please.

Mr. Pat Finnigan (Miramichi—Grand Lake, Lib.): Thank you, Mr. Chair.

Thank you to the panel for being here.

I'm from New Brunswick, Miramichi specifically, where the river is famous for its Atlantic salmon. As you probably know, it's under stress. The numbers are going down. Close to 10 years ago I guess now, they spotted the smallmouth bass in Miramichi Lake, which is a tributary of the Miramichi River. Until now they've tried to contain it and they've also tried to fish it out, but they cannot eradicate it.

Dr. MacIsaac, when you have a problem you use everything in your tool box. To eradicate the smallmouth bass would cost about $1.5 million. The Miramichi salmon recreational fishery is worth between $20 million and $30 million a year. I know there's risk in using rotenone, but I think it has worked well, especially in small lakes where you can control the application. In my backyard we've used it to eradicate pickerel, which was also brought in by someone and it's also a lake that is a tributary to the Miramichi.

Where do you say we should balance the risk in eradicating a species like the smallmouth bass that would be very detrimental to the salmon?

Prof. Hugh MacIsaac: Whenever these cases come up you want to make an informed decision, and you have to be able to quickly call upon a variety of expertise to address the question. It may include hydrology. If we apply a toxin, where is it going to go next? Do we have endangered species in this system? If you do, then some of these tools, such as application of rotenone or something like that, you may immediately withdraw, simply saying the risk is too great for our endangered species. If you don't have those types of problems, then very clearly I would argue in favour of attempting to eradicate.

We had an unfortunate case a couple of years ago in Lake Winnipeg where they did try to eradicate the zebra mussel. Unfortunately, I think they didn't know the complete distribution of the species at the time and so that effort failed. But do you know what? They tried. So I have nothing but applause for what they tried to do, to see if we could keep that thing from getting into western Canada, but make sure you make informed decisions.

Mr. Pat Finnigan: Yes, I agree.

Do you want to comment, Ms. Wallin?

Ms. Gail Wallin: Bass is usually introduced by fishers, so stopping people from releasing that fish and others is a really big solution too.

● (1705)

Mr. Pat Finnigan: Thank you.

The other thing you touched on, Dr. MacIsaac, was climate change. Again, going back to my backyard, the Miramichi, we have striped bass, which is a native species, but now because apparently the Gulf of St. Lawrence has been the fastest-warming body of water on earth in the last five or six years—that's what we hear—we know now that the striped bass has been spotted in Labrador, 1,000 kilometres north of its regular habitat. How much has climate change affected the spread of invasive species? If we could manage climate change, how important is that aspect of it?

Prof. Hugh MacIsaac: Climate change is a huge issue, and I realize that your government is doing its best on this. It's an enormous global issue to address.

Invasive species are an international, national or regional issue. In many cases, effectively managing an invasive species problem will be easier, clearly, than trying to manage climate change. All we can do with climate change is develop models like the one I showed—that last slide of the tunicate species—to try to determine where these things might go next, and if you don't want them in those areas, then you start monitoring, using whatever means you have available.

You might use settling plates. I know in British Columbia in the marine waters they use settling plates a lot to see what's out there. You can use settling plates. You can use eDNA. You can do lots of things to try to give you.... You can say you think an area is at particular risk, so let's put extra resources into monitoring to see if it does show up there.

Mr. Pat Finnigan: Often when invasive species come in and thrive, it's because they don't have natural enemies, whether they're plants, insects or water, right? Has it ever been tried to bring in predators to try to control some of those? We do it in agriculture.

Prof. Hugh MacIsaac: I hate to tell you that often they do have natural enemies, and in many cases, if they didn't initially, then very shortly thereafter many native species will go after them. There are colossal disasters where humans have tried to introduce other things. We introduced the mongoose to try to control things like rats. Well, the mongoose is active at a different time of day than the rats are, so the mongoose ends up going after the wrong species. There are textbook examples in conservation biology of what not to do, and it's largely because.... I mean that's pretty basic. If I'm going to introduce a biological control agent, I want it to go after my target. Not knowing that one species is active during the day and the other is active at night, I mean, how much worse can you get than that? That's just totally incompetent.

Dr. Anna Warwick Sears: On the other hand, 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.

The Chair: Thank you.

I notice Jodi Romyn has her hand up to comment on that.

Go ahead, please.

Ms. Jodi Romyn (Senior Manager, Invasive Species Council of BC): Thanks very much.

I just wanted to add that, further to that, I'm not aware of many examples of successful biological control agents for aquatic invasive species, but there are a lot of great success stories for invasive plants, and a lot of great work that I know is largely driven through the federal government. I think that really is an area that could be explored further.

I know that in B.C. it's certainly one of the tools that we see as part of the tool kit, and one that's allowed some of our efforts to focus more on new eradication of new species. I do think that's something that could be considered more.

The Chair: Ms. Sparks, you were going to comment as well.

Ms. Deborah Sparks: My comment is not on the biocontrol per se. We talked a bit about eDNA testing and monitoring, and I just wanted to also agree that we think that having this kind of data and screening pathways is important. I also wanted to mention the importance of having good risk assessment, so that you know what you're dealing with and you can set priorities. Beyond that is having a plan, having a response strategy in place. You already know you have a high risk, so what are you going to do when the problem presents itself? You don't figure it out when the species arise. You need to be talking with your partners ahead of time. Who are those people? That is the feds, but it's also the provinces and territories, our U.S. neighbours, indigenous communities, municipalities, researchers, NGOs. You want to bring all of those people into the fold so that you can be effective. You can use existing mechanisms. You don't need to reinvent the wheel. You can create MOUs with other partners where they don't exist. You can look at the mutual aid agreement on Asian carp with all of the provinces and states around the Great Lakes as a really good example.

We definitely agree that you need your data and you need to do your screening, but beyond that, we all have to work together and have a good plan, because there's no single agency that's going to be able to do this job. I know we're talking a lot about DFO, but even DFO can't do it alone with all the resources in the world. We're definitely going to have to work together and be strategic.

● (1710)

The Chair: Thank you for that.

Before I go to Mr. Calkins for five minutes or less, I will remind the committee that we have some committee business to do at the end. We can either add on a few minutes or finish up at 5:20 or 5:25. I will leave that up to the committee.

Mr. Calkins, you have five minutes or less, please.

Mr. Blaine Calkins (Red Deer—Lacombe, CPC): To anybody who wishes to answer the question or address this, is any country or any region of the world using a particular model to control, prevent or destroy aquatic invasive species that we have examined thoroughly and could be gaining information and knowhow from, but we are currently not?

Prof. Hugh MacIsaac: I mentioned hull fouling. That's the next principal vector that I would be focusing on: hull fouling and the live trades. I think the best case study would be hull fouling in Australia.

Dr. Anna Warwick Sears: I would like to add to that. I think the key here is that 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.

This is why we're coming here and pleading with this committee to really help us with prevention, because prevention is going to be cheaper. Prevention is low tech. Prevention is a matter of working with the existing regulatory systems, working with conservation officers or what have you. That's what is going to be the real key here, rather than trying to come in and find a miracle cure because there's probably not going to be one.

The Chair: Mr. Bouzan has his hand up.

Mr. Blaine Calkins: Go ahead, Mr. Bouzan.

Mr. Andrew Bouzan: Prevention, of course, is the essential component of what everyone here wants to see in any freshwater marine environment and ecosystem, but it's the response that's there as well. As I highlighted previously on the green crab issue in Placentia Bay and St. George's Bay here in Newfoundland, it took over a year for DFO to put together anything to assess and evaluate what happened and then try to put a plan in place. Quite frankly, a year is an awfully long time to evaluate, assess and put anything in place.

Obviously, assessments and evaluations of coastal environments and ecosystems should be a priority everywhere across the country. When these invasive species are found, there needs to be a much more effective and efficient way to address them fast to ensure that, whatever ecosystems they are found in, they are not going to spread, and hopefully they will be eradicated before they cause serious and detrimental harm to all wildlife and the ecosystem.

● (1715)

The Chair: Go ahead, Jodi.

Ms. Jodi Romyn: I wanted to further that point. Certainly prevention has always been our major focus. I think a lot of excellent work has been done by provinces and territories across Canada, and a lot of the regional, local groups and indigenous communities that we work with.

In some cases, the plans are there and what's required is the funding to help make them happen. I really think there's also a lot of opportunity for the federal government to work more closely with the provincial governments. Make sure that there are clear mandates and make sure that we do have the ability to respond and work within whatever partnerships we have established within our provinces.

I think there is a lot of opportunity for us provincially and within the territories to really leverage federal funding and see a greater impact on the ground. It is just a matter of having some seed money that we can use to help try to grow and really enact our plan.

Mr. Blaine Calkins: I have another question, and it's a bit philosophical. What I'm hearing from you folks is that the logical and common sense approach is to make sure that we utilize the best practices that we already know about for prevention, which I think is what we're trying to do, and to make sure that we have the funding available in order to implement those best practices with regard to prevention. I suppose it's a bit of a philosophical conundrum that something that will play out for years and decades to come is whether or not we can stabilize the effects of climate change.

Given the fact that the world is changing, which would infer that the natural ranges of species would also change, how will we differentiate in terms of what is invasive? Right now, some people would say that an invasive species is a species that is moving into a geographic range that it didn't once occupy, although because of certain conditions changing, it is now part of the natural range. How much effort should we place on differentiating between species that are undergoing a natural extension or change to their natural geographic range and those that are truly invasive and wouldn't otherwise be there, other than because of some man-made type of vector transmitting them there? Is that a conversation we need to have?

Dr. Anna Warwick Sears: I'd like to jump in on that. I think the important thing here—I'm sure you can ask my friend the professor here about his technical terminology—is triage. You're looking at what will have the largest impact on your environment. In the west it might be cheatgrass, which increases the risk of fires on rangeland. It might be Scotch broom, which also chokes out a lot of other plants and increases the risk of fires. It might be invasive mussels that have a huge ecosystem impact.

Certain species are like the dirty dozen, or the dirty 50, or something like that, that are just known, when they come in, to have a huge impact. In the yard next to my house, there is a tree that is an invasive species in Arizona. I just moved into that house. I laughed, because I know that millions of dollars are spent eradicating it in Arizona, but it is not invasive in Kelowna. You really have to use your intelligence, use the tools you have and do the risk assessments. Some are bad and some aren't.

The Chair: Thank you.

Mr. Calkins, you just had a seven-minute session instead of five.

We'll go back to the government side.

Mr. Fraser, you have five minutes or less, please.

Mr. Colin Fraser (West Nova, Lib.): Thanks so much, Mr. Chair.

Ms. Sparks, you talked about the Asian carp program being a useful model, one that incorporated discussions amongst a number of jurisdictions around the Great Lakes. Can you tell me what's going on right now with regard to Asian carp in the Great Lakes? Is that invasive species issue considered to be under control? I'm aware of a possibility that Asian carp could be sent out east to the Atlantic coast to be used as lobster bait in traps. I'm wondering if you have any comment on that, if you're aware of it.

Ms. Deborah Sparks: We can speak a bit to the Asian carp in the Great Lakes situation. I'll look to colleagues in the room to speak to the east coast situation, because I'm not aware of that.

I'm really happy that my colleague just came back into the room, because she is our project coordinator on the Asian carp project.

We're looking for an update on what's going on in the Great Lakes with the Asian carp, please.

● (1720)

Ms. Rebecca Schroeder: I'm sorry; I had to step out. I have a bit of a cold.

Right now DFO is working very heavily with a lot of state agencies. We're on a bunch of different committees with a binational focus because it is a shared resource; the Great Lakes are in Canada and the United States.

DFO is working with a number of partners on their first pillar. The four pillars in their program are prevention, early warning, response and management. On their first pillar, they work with a lot of partner organizations to conduct education and outreach. We're one of them. On the early warning front, they do a lot of monitoring in the spring and summer months. They check areas that they've identified through risk assessments to be hot spots for potential tributaries or breeding grounds for Asian carps. They very recently completed an incident command structure, which you might have read about in the auditor's report, where they looked to a professional agency to help them come up with a response if they were to find Asian carps in the Great Lakes.

I'm happy to say that we are not considering Asian carps to be established in the Great Lakes, or not on the Canadian side, anyway. Grass carp are reproducing in the tributaries of Lake Erie on the United States side. Ohio will be initializing a response, hopefully this summer, to do some eradication.

I hope that was a good overview.

Mr. Colin Fraser: Yes, that's very helpful. Thanks very much. Perhaps I'll turn to Dr. MacIsaac, then, to answer the second part of the question.

My understanding is that there's an examination of whether or not Asian carp could be used as bait in the lobster fishery on the Atlantic coast. I know there's some discussion about that. I'm assuming the fish would be killed and then brought out and used as bait in that fishery and in the United States as well. First of all, do you know about that plan?

Prof. Hugh MacIsaac: Yes, just from a newspaper report.

Mr. Colin Fraser: Do you have any thoughts about any issues that it may raise or that we should be aware of?

Prof. Hugh MacIsaac: You want to make sure that the fish are not contaminated excessively with any type of organic compounds, but if the flesh is safe in terms of contaminants and if you can demonstrate that you're not going to be transmitting parasites or something like that to a new area, you may be able to process that.

I know that some of the other carp from the Mississippi drainage is collected and sold in Asia, so make lemonade out of lemons, but again, make sure you go into it knowing what you're doing and whether or not there's any risk associated with transferring other pathogens to the east coast.

Mr. Colin Fraser: It could be a useful way to dispose of these invasive species.

Prof. Hugh MacIsaac: I think it could, yes. Sure. There's a lot of biomass there.

Yes. I would look at it for sure.

Mr. Colin Fraser: Great. Thanks very much.

I'd like to turn to you, Ms. Warwick Sears. Earlier today, I was speaking to a colleague of mine, Stephen Fuhr, who is the MP for your area. He told me about the water milfoil control activities that are going on and the concern around it being in conflict, I guess, with protecting the native mussel species there.

I'm wondering if you can tell us at what stage that SARA listing is as far as DFO is concerned. What effort has your organization in particular made in order to try to bring this problem to the department's attention?

Dr. Anna Warwick Sears: Thank you for asking that question.

I'm not an expert in endangered species listings, but my understanding of it is that the proposal to list this was published in the Gazette and there was a one-month public comment period. We had one month to do our legislative review and respond. I think the deadline was April 22. There was not time for us to do the legislative review and then communicate with our community and local government partners and get their feedback to the minister.

What we've done is we've sent in a very detailed letter explaining all of the issues and why we did not feel there had been (a) enough public consultation or (b) even enough research. There had been research papers done in 2015 that weren't even considered and were showing that there were many more of these native mussels in the system. We've sent out a lot of communication to the local governments, the chambers of commerce, the yacht clubs, boating associations and different public entities, and we've asked them to write letters directly to the minister talking about how the listing would impact them.

We support the continuance of this northern range of the Rocky Mountain ridged mussel in our valley, but we feel that if we are rototilling a small fraction of the lakeshore, we are not going to be severely impacting the mussel. We also feel that the public benefit of controlling the invasive species really needs to be balanced with the moral question of protecting the endangered species.

● (1725)

Mr. Colin Fraser: That's helpful. Thank you for your good work.

Those are my questions.

The Chair: Thank you. You were a bit over your time.

We'll finish up now with Mr. Johns for three minutes or less, please.

Mr. Gord Johns: I'll be really quick here.

Mr. MacIsaac, you talked about Australia and New Zealand. On numbers, what kind of money are they putting into that? Do you know?

Prof. Hugh MacIsaac: I would have to look.

Mr. Gord Johns: Okay. You don't have that.

Prof. Hugh MacIsaac: No.

Mr. Gord Johns: I just thought I'd check.

Ms. Hooper, you haven't had a chance to say a lot. I've seen you nod a few times over there in eastern B.C. I have a few things.

The environment commissioner's report noted that DFO had done risk assessments for 14% of the 174 invasive species it had identified. There was a socio-economic risk for 5% of the species. Does that statistic reflect the inaction you're seeing on the ground there?

Ms. Robyn Hooper: Yes, I believe so.

It's been great listening to the other comments. As you see, I've been nodding in response. We're really not seeing a lot on the ground here.

Mr. Gord Johns: Okay.

Can you break down the costs? We've talked about the cost of programs to eradicate the species in an area once it has set in and has taken hold—Mr. Calkins raised it as well—compared to the costs of preventive measures. Do you want to talk a bit about that?

Ms. Robyn Hooper: With invasive mussels, there are no eradication possibilities at this time, so we're dealing with annual management costs. In Ontario alone it costs nearly $100 million annually to manage invasive mussels. We really don't know how much it could cost, given the impacts to our region. As Anna Warwick Sears said, the region of Okanagan Shuswap is so important to the water systems that we have, so the cost is astronomical and eradication is not possible.

Mr. Gord Johns: Did you want to add any words in the little bit of time you have left? I saw you nodding, and I want to make sure you get a chance to add something.

Ms. Robyn Hooper: Thank you, yes.

I'd reiterate and summarize how important prevention is, closing these high-risk pathways, and in particular, looking to the west in terms of what resources we have that we could use and what we can do to contain species that are already out east. As many other groups have said, we need collaboration with the provincial level as well as regional groups on the ground. In the Okanagan and our region, we've spent a lot of funds doing work on the ground with little provincial and federal support.

Mr. Gord Johns: Thank you.

The Chair: Thank you, Mr. Johns.

That clues up this presentation with regard to our witnesses and questioning. We will stay for a couple of minutes once we've cleared the room.

In closing, to our witnesses who appeared in person and by video conference, thank you for your patience, and of course, for your informative testimony to the committee today.

[*Proceedings continue in camera*]