





James Littley
Okanagan Basin Water Board



Good afternoon, I'm James Littley, the Operations and Grants Manager, and I'm also the Staff Lead on the Invasive Mussel file. This file has two complementary components to it. First is the advocacy, public policy component, which I lead, and second is the Don'tMoveAMussel public education and awareness campaign, led by Cori, the Communications Director. I'm going to give an update on the public policy side of things today.

Actions to Prevent Invasive Mussels

- The Okanagan Basin Water Board's mission is to provide leadership to protect and enhance quality of life in the Okanagan Basin through sustainable water management.
- Define water problems and priorities, economic feasibility of solutions, responsibility, necessary legislation and required action.

For context, the OBWB's mission is to provide leadership to protect and enhance quality of life in the Okanagan Basin through sustainable water management. Part of our mandate is to define water problems and priorities, the economic feasibility of solutions, responsibility, necessary legislation and required action. As part of this mandate, since 2012, OBWB has been calling for action from the province and federal governments to prevent the introduction of these species into B.C.



So, to set the stage, I wanted to quickly go through some pictures of these mussels, and then we'll watch an animation of their spread across North America.



This is what it looks like under the water.



This is the bottom of a dock or barge.



This is what the prop could look like on your fishing boat.



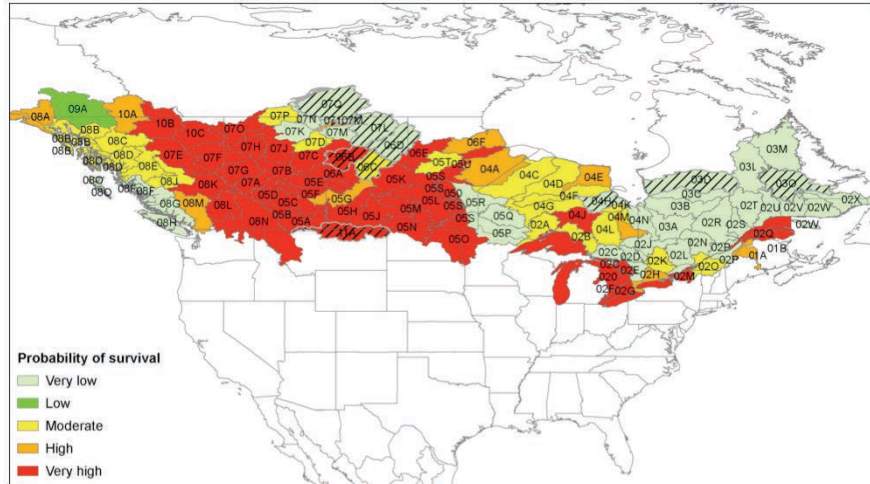
Here is what a water intake pipe looks like with invasive mussels.

[https://nas.er.usgs.gov/queries/
SpeciesAnimatedMap.aspx?speciesID=5](https://nas.er.usgs.gov/queries/SpeciesAnimatedMap.aspx?speciesID=5)



So that's how fast they spread geographically, and this photo shows you how fast they spread within an area. In this case, the pipe on the left is at zero months, then two months, four months, and on the right, only 6 months after infestation.

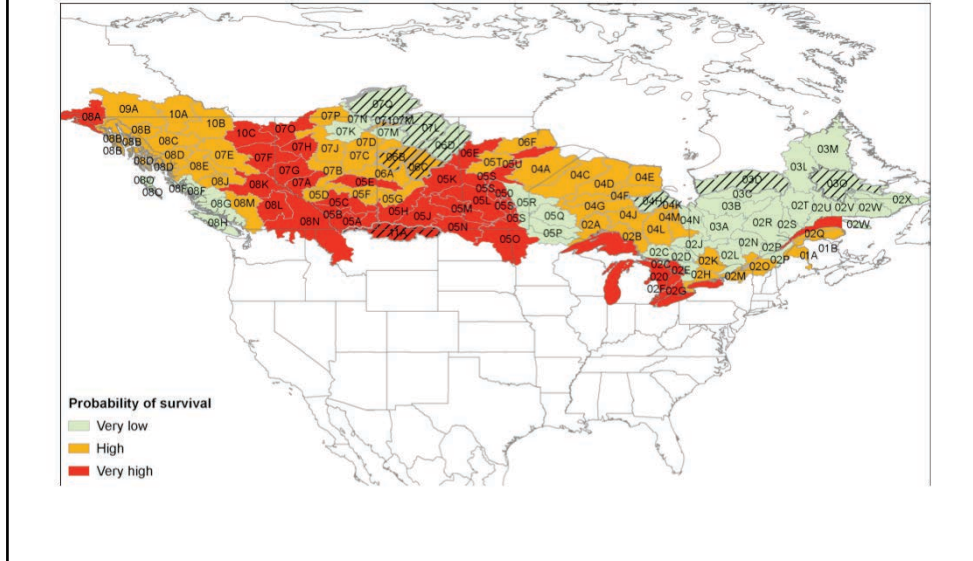
Probability of Survival - Zebra



Source: Canadian Science Advisory Secretariat: Risk Assessment for Three Dreissenid Mussels in Canadian Freshwater Ecosystems CSAS. Research Doc 2012-174

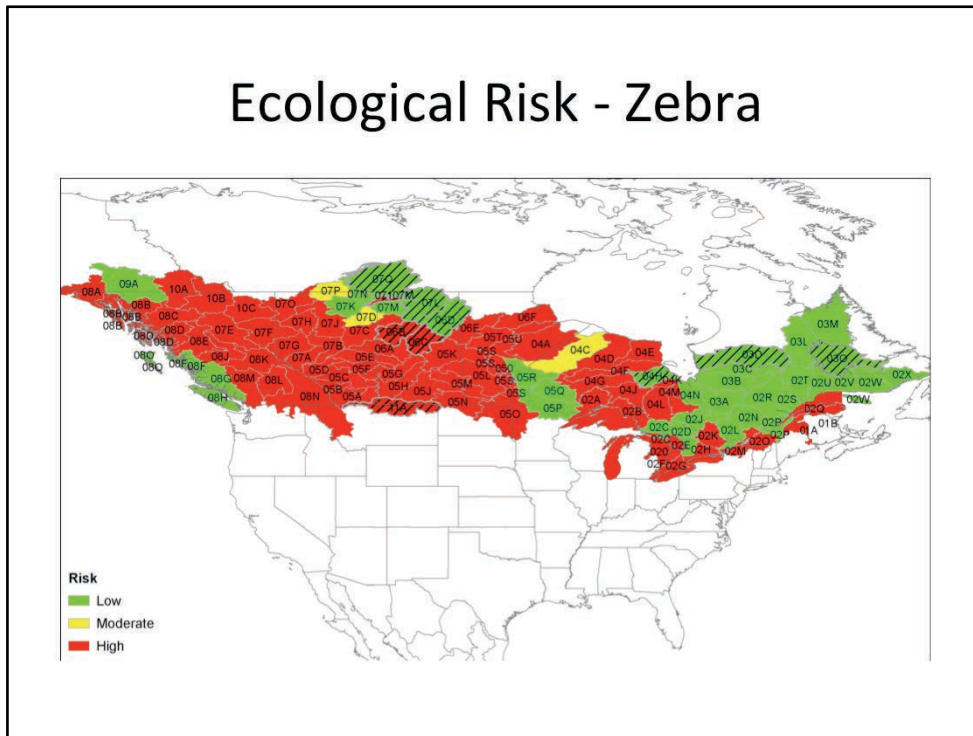
Here is the probability of survival for Zebra mussels across Canada

Probability of Survival - Quagga



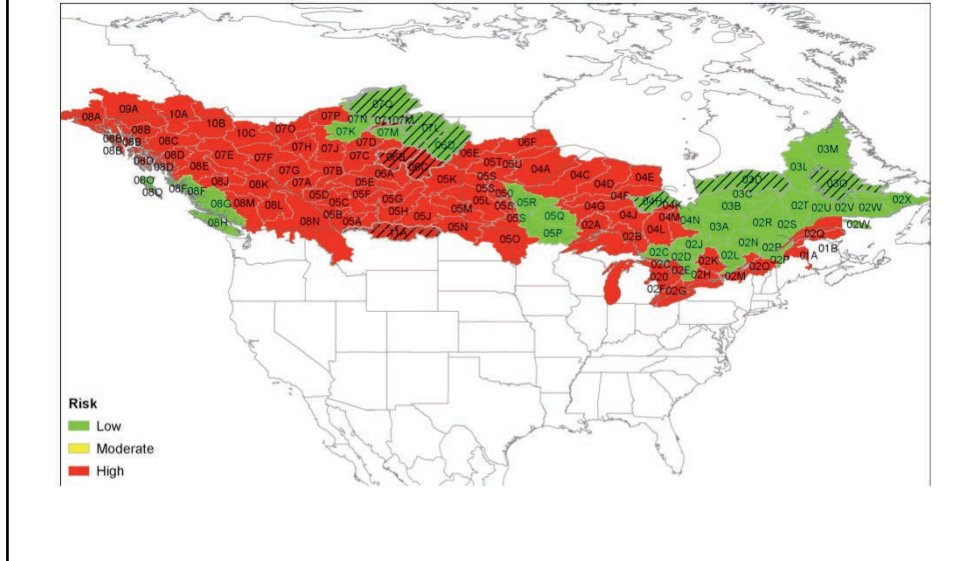
Now for the Quagga mussels, compared to the Zebra, they have a higher probability of survival in most areas,

Ecological Risk - Zebra



And when we look at the Ecological impacts of each species, they are both pretty bad. Native fish populations which feed on zooplankton and deepwater zoobenthos will generally decline, while fish species that feed on littoral zoobenthos, generally increase. So, basically, salmon, trout and other native fish decline, and junk fish like bass, perch and whitefish increase.

Ecological Risk - Quagga

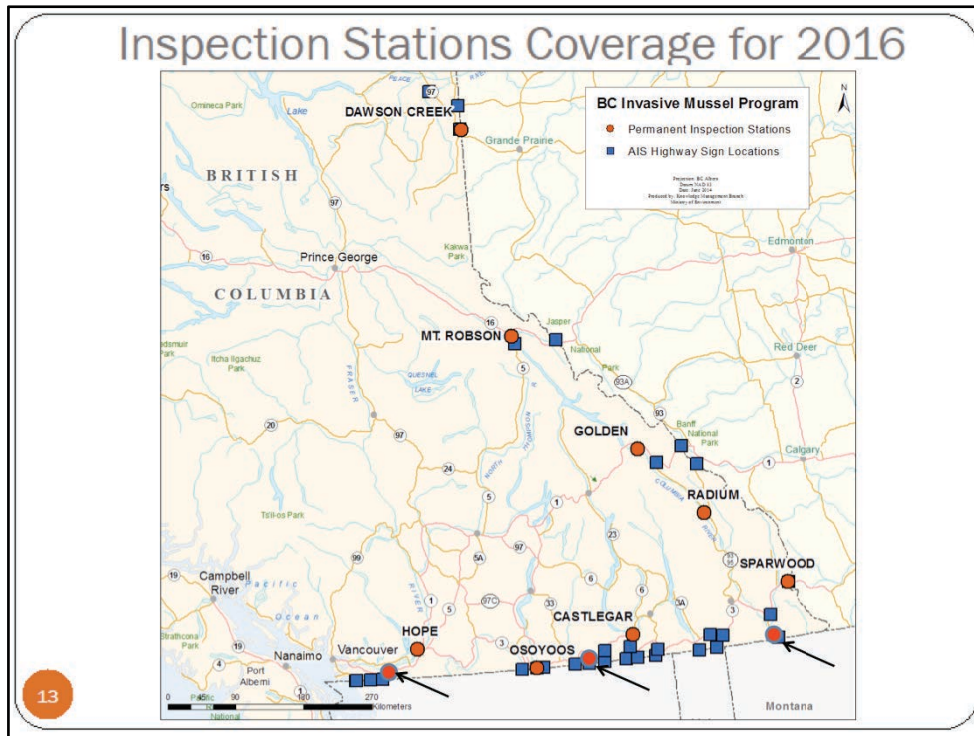


And again, for quagga mussels, the ecological impacts are also staggering. Now I'm going to explain a little more about how they affect the ecosystem.

B.C. Announces Changes March 2017

- Increase to 11 Permanent Stations (Penticton, Cranbrook, Lower Mainland (2), Invermere, Golden, Valemount, Nelson, Dawson Creek, Yahk, Midway)
- Added a multi-purpose mussel sniffing dog
- Expanded monitoring through HCTF
- Increased inspection officers to 68 (from 35)
- Added \$3 million to cover these costs.
- **NOT ANNOUNCED – Still not illegal to bring a boat in and launch without an inspection!**

And in March, we did see significant movement on our calls. The province added two new inspection stations and extended their hours to generally daylight hours. The inspection station in Golden is supposed to be open 24 hours/day, as the busiest travel route. They also added a mussel-sniffing dog. They increased the number of inspections from 35 in 2016 to 68. And they announced \$450,000 to the Habitat Conservation Trust Fund for increased mussel monitoring in our lakes. Altogether, this adds \$3 Million to the program. Unfortunately, it is still not illegal to bring a boat into the province and launch it without an inspection.



Here is what the provincial inspection regime looked like this summer.

Provincial Inspection Stations

Year	2015	2016	2017
Inspections	4,351	24,100+	35,000+
High-Risk	70 (1.6%)	673 (2.8%)	2,045(5.8%)
Contaminated	15 (0.3%)	17 (0.07%)	24 (0.07%)

Increased inspections in 2017 by 145% over 2016.

One in every 1,458 boats is carrying adult invasive mussels.

Imagine if one in every 1,458 air travelers was carrying a bomb...

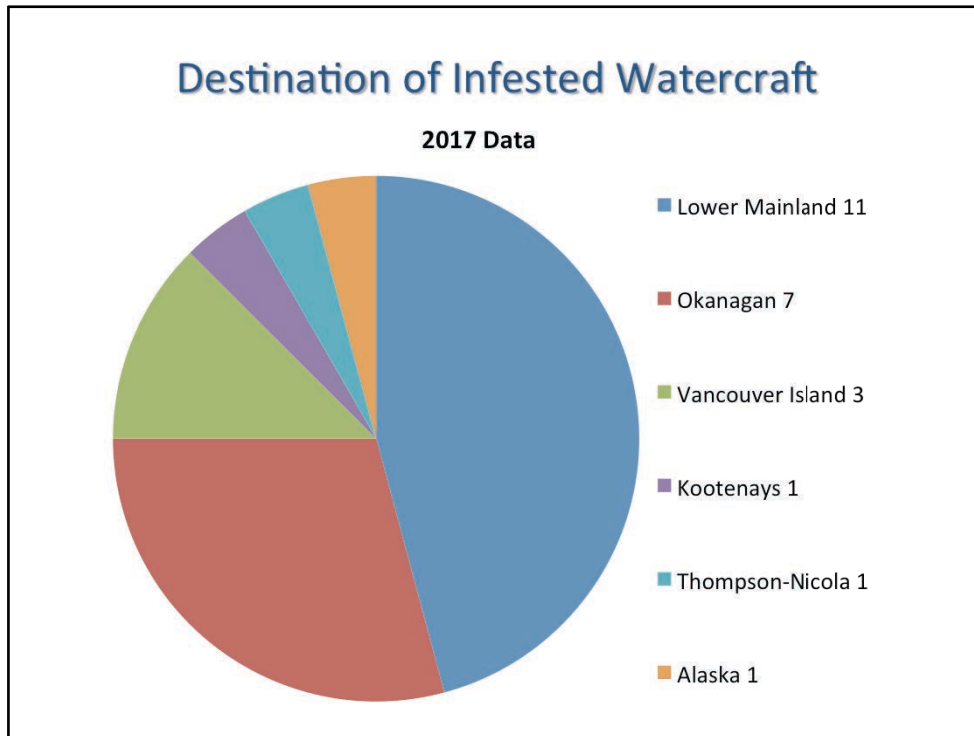
So in 2015, the province began a trial inspection regime, with roving inspection stations at several locations in the province. In 2016, they made some of the stations static, and hired more people, with longer hours. In 2017, they doubled the number of inspectors, increased the inspection station hours, and inspected 145% of the boats compared to 2016. What's interesting, is that with a large sample size, over two years, the percentage of mussel fouled watercraft is similar.

Provincial Status Report

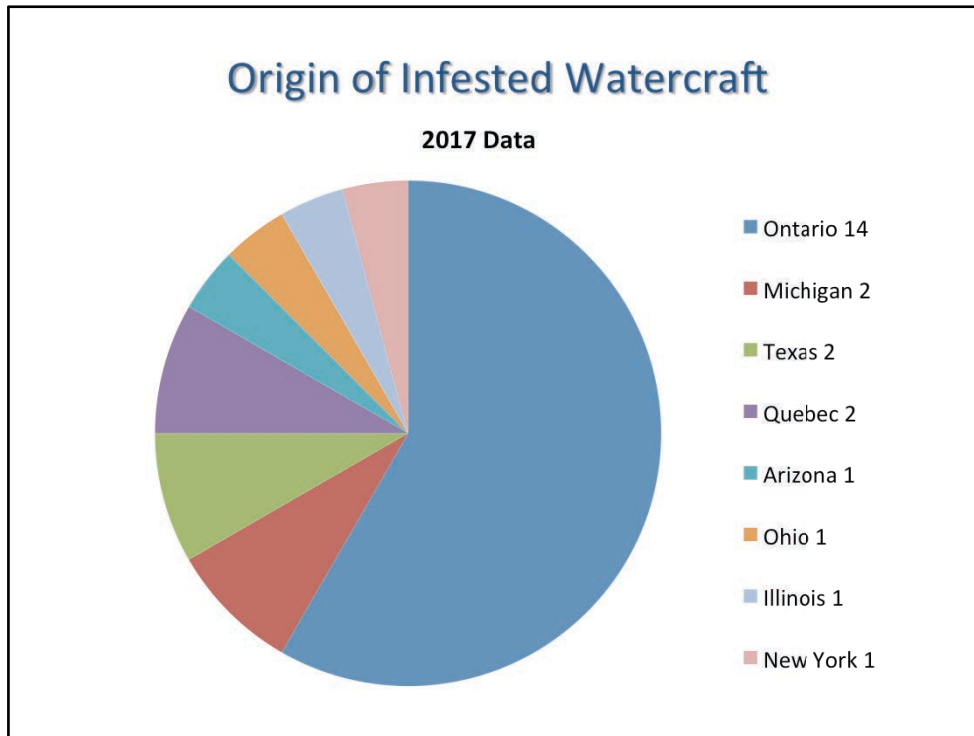
21 August – 16 October

Reported	Also Means
81% Compliance Rate	19% non-Compliance Rate
76% of non-compliant, non-motorized	4.5% of total = non-compliant motorized
Non-compliance = low-risk	Non-compliant = 1,596 motorized
24/35,000 had adult invasive mussels	2,045 high-risk, 276 Decontaminated (and 192 quarantined = 1/182)
1/1,458 is infested with ADULT mussels	Statistically, 1 infested boat failed to stop
1/17 watercraft are high-risk	Statistically, 94 high-risk failed to stop (of those, 9 would have been quarantined)
304 Notifications from CBSA	0.86% of the total*

*Unknown if CBSA inspection data is included in the 35,000, or if more inspections were done, and not reported.



Here is the 2017 data for where the infested boats were headed. You will note that 29% of them were coming here to the Okanagan.



Here is the 2016 data for where those high-risk boats were headed. You will note that 23% of them were coming here to the Kooteneys, and 14% going to the Okanagan. So combined, that's 37% of high risk boats headed for the Columbia River basin.

OBWB 2017 Call to Action from B.C. Prevention

- Require all watercraft entering BC to report for inspection prior to launching
- Expand inspection and decontamination options and increase signage
- Expand full-status COs
- Review use of mussel-sniffing dogs
- Funding for regional Invasive Species groups
- Province-wide, non-boater education campaign

In a February letter to the province, we called on the government to:

Require all watercraft entering BC to report for inspection prior to launching

Add invasive infestations as a specified hazard under provincial Emergency Management – which would ensure funds are available to try to contain any new infestation.

Enhance monitoring network

Expand watercraft inspection station hours and dates of operation (previously 10 hours/day)

OBWB 2017 Call to Action from B.C. Prevention

- Engage prof. regulatory bodies to inform members of best practices
- Coordinate with feds for more action for containment, and prevention
- Call on feds to amend air transport regs
- Amend pleasure craft operator card – Clean, Drain, Dry
- Coordinate with other western provinces on call to federal action

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OBWB 2017 Call to Action from B.C. Preparation

- Build contingency fund for rapid response and containment
- Assist local governments, utilities purveyors with vulnerability assessments
- Provide centralized inspection and decontamination facilities in at-risk areas
- Funding for research for containment/eradication materials, and pre-approvals
- More research funding for effects on native species, economy, infrastructure, detection, control and eradication

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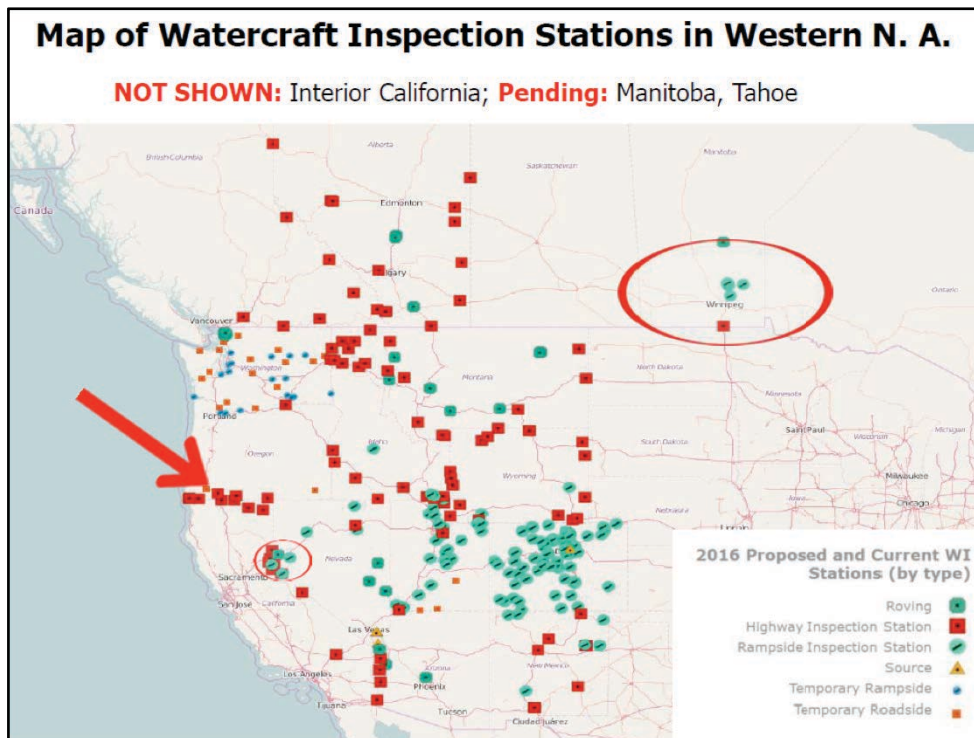
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Enhance monitoring network

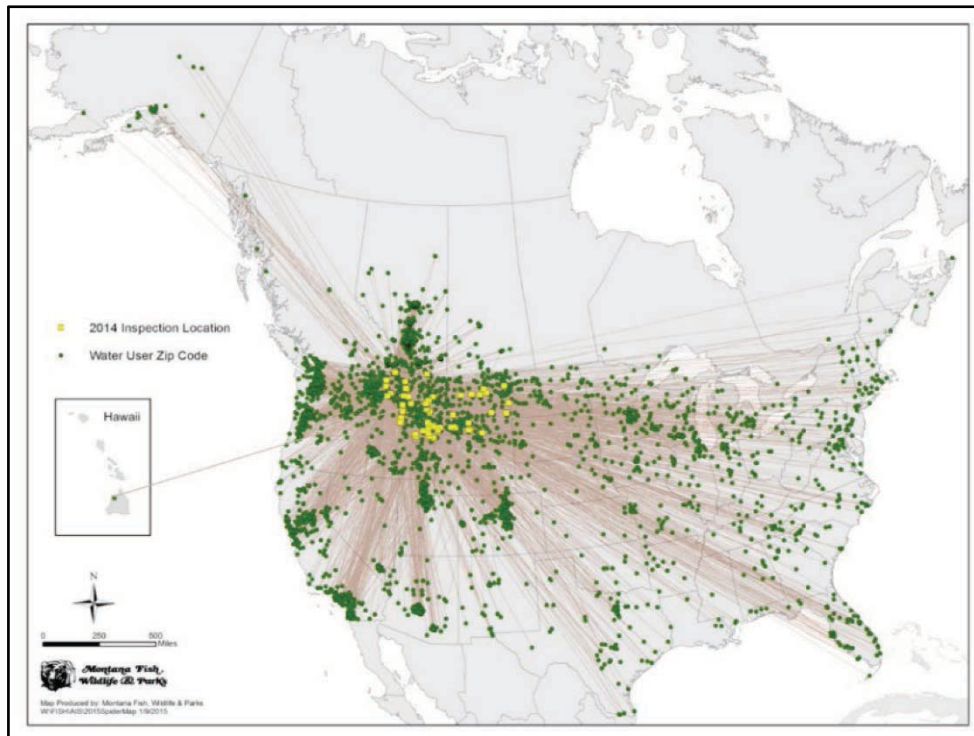
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OBWB 2017 Call to Action from DFO

- Allocate targeted funding to match provincial efforts
- Develop joint-work plan with CBSA for mandatory watercraft inspections
- Send senior staff to PNWER forum to coordinate efforts (This actually happened)
- OBWB requests a response letter as soon as possible (Nothing yet)



I also wanted to take a minute to explain that boaters might be stopped a number of times as they move through different jurisdictions, and each time you'll potentially be subject to the same questions, and potentially even multiple decontaminations. Here is a rough layout of the inspection stations in the pacific northwest in 2016. And as complicated as that might look,



This is a map of all the boat traffic heading just through Montana's inspection stations in 2014. So you can see how complex it is to try to inspect all the boats heading into uninfested areas. Other jurisdictions also have different legislation, and in some of the states, if you have a high-risk boat, but you're headed for B.C., they won't decontaminate you, they'll just call BC, and let the province know you're coming.

R.A.P.P

REPORT ALL POACHERS AND POLLUTERS

CONSERVATION OFFICER 24 HOUR HOTLINE

1-877-952-RAPP (7277)

Cellular dial - #7277

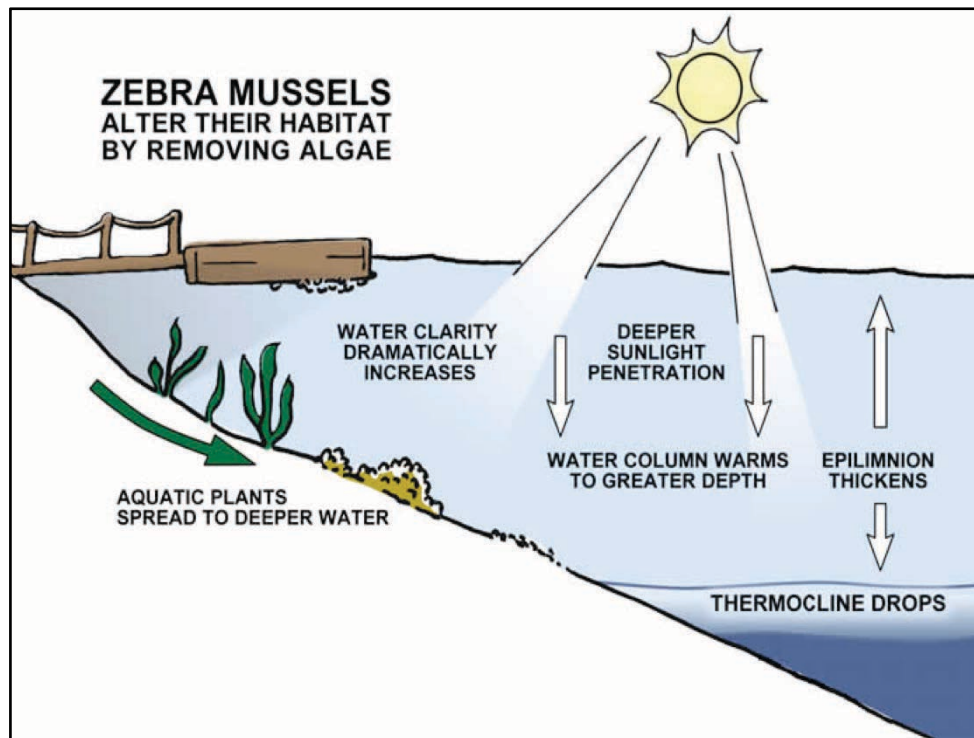
So, we ask that you also raise awareness of the threat, and that you maintain a lookout for any boats that might look like they are infested with these mussels. Also, keep an eye on the water in your area. If you see something that you think could be a zebra or quagga mussel, call the RAPP line to notify the provincial authorities.

THANK YOU



James Littley, Operations and Grants Manager
James.littley@obwb.ca 250-469-6270

Thank you again for inviting me to speak, and I'd be happy to take any questions.



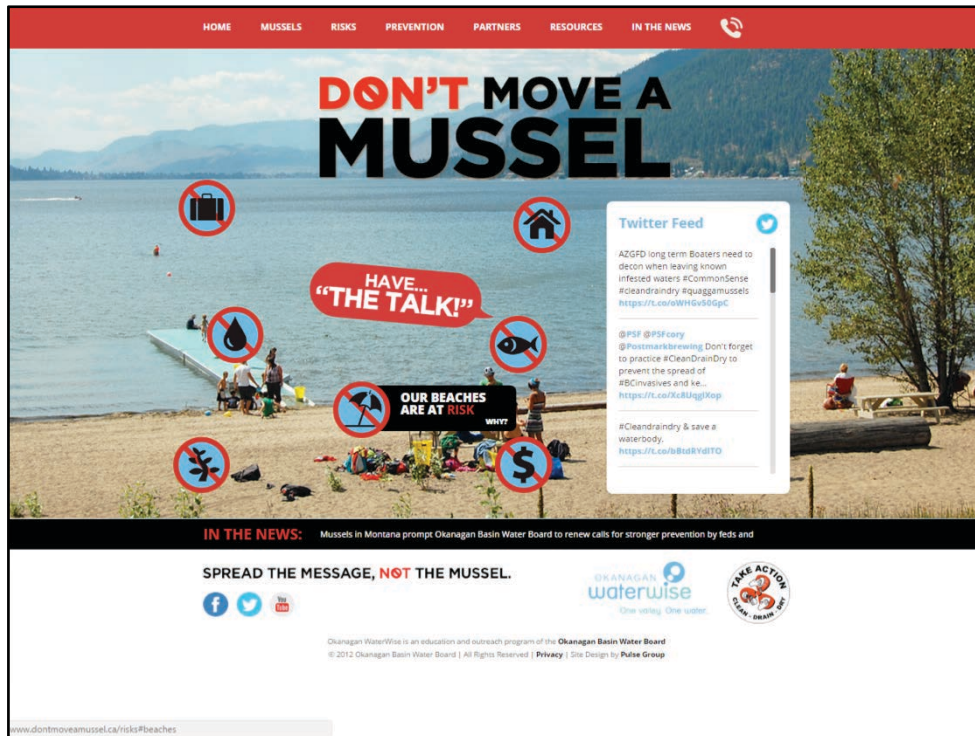
These mussels are selective filter feeders. They super-filter the water, which robs the nutrients two-levels down in the food chain from fish, Killing zooplankton, so they starve out the animals that the fish usually eat, including juvenile fish, reducing or eliminating native fish populations. They also increase the clarity of water, which causes a rise in temperature, which reduces the depth zone where fish can survive. They are also selective in that they reject some toxins and spit them back into the water. Of course, much of this is our drinking water, putting its quality at risk. The clearer water also allows aquatic plants to spread into deeper water. In fact, milfoil is one of the few species that thrives after a mussel invasion. Milfoil, also provides better conditions for junk fish, and reduces the viability of native fish like salmonids.



Of course, millions of mussels also excrete excess nutrients into the water, and after about four years of consuming all the healthy food, creating crystal clear water, the first generation begins to die off, leaving huge amounts of biomass and toxins, like botulism and E Coli. In the great lakes, in 1999, scientists counted 311 birds that had died from botulism. By the following year, there were 8,000. Every year since then, there have been thousands of migratory birds washed up, killed by botulism, that is thought to be directly related to Zebra mussels.



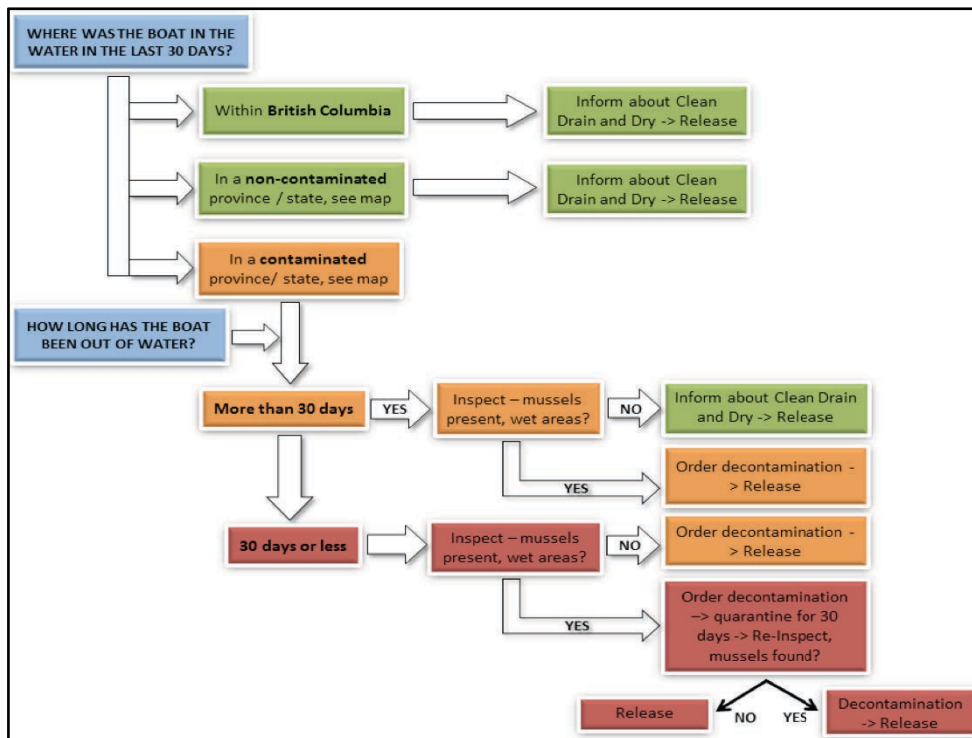
Of course, the advantage of the Clean, Drain, Dry behaviour is that it will stop all invasive aquatic species, not just zebra and quagga mussels.



For the last few years, the OBWB has been raising public awareness about this threat. We have placed billboards, run radio and print ads and of course, we have the Don'tMoveAMussel.ca website.



We have also partnered with communities throughout the Okanagan valley to put information at boat launches to remind people to clean, drain and dry their boats. On a larger scale, we've been working with the province, providing some inspection training to local marina operators, and we're been collaborating with the Invasive Species Council of BC, and the Pacific Northwest Economic Region, who estimates an invasion could cost \$500 million each year to the pacific northwest. So we have been very busy trying to spread the message and increase action.



So, if you're bringing a boat into the province, there are some things you should know that will help make sure you're in compliance with the laws, and that you're not spreading the mussels. This is the flow chart that the inspectors follow at the stations. The best thing to do is not take a boat from infested waters into BC. But, if you do bring a boat to BC, make sure you clean, drain and dry the boat, and if you were in an infested lake, leave it out of the water for 30 days after drying it. **(Go Through the Flow Chart)**