

What are Aquatic Invasive Species (AIS)?

- Not native
- Animal, plant or pathogen
- Prolific reproduction
- No effective natural or native predators



 Poses a significant risk to the economy, environment and/or human health





















Invasive Mussels



- Quagga and Zebra
- Native to the Black/Caspian seas
- Discovered in North America in 1988
 - Trade & Transport
- Rapid spread across midwest and east









Invasive Mussels...

- Can live up to 30 days out of water
- Filter feeders (up to 1 liter per day per mussel)
 - remove phytoplankton, zooplankton, algae
- No feasible control options
- Free-floating microscopic larval form (veligers)



Mussel impacts on the economy

- Filling intake pipes, irrigation lines, dam operations
- Clogging screens
- Requiring new capital and maintenance costs
- Increased costs to users
- Crop & food production; drinking water & waste water Alberta water-operated infrastructure is valued at \$14 billion

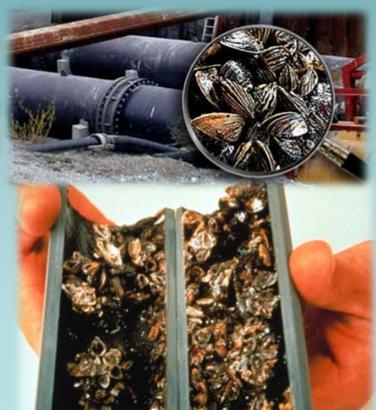
















Mussel impacts on the Environment

- Filter enormous amounts of plankton, affecting entire food web
- Smaller and fewer fish
- Outcompete native species
- Link to avian botulism
- Accumulate toxins
- Create toxic algal blooms







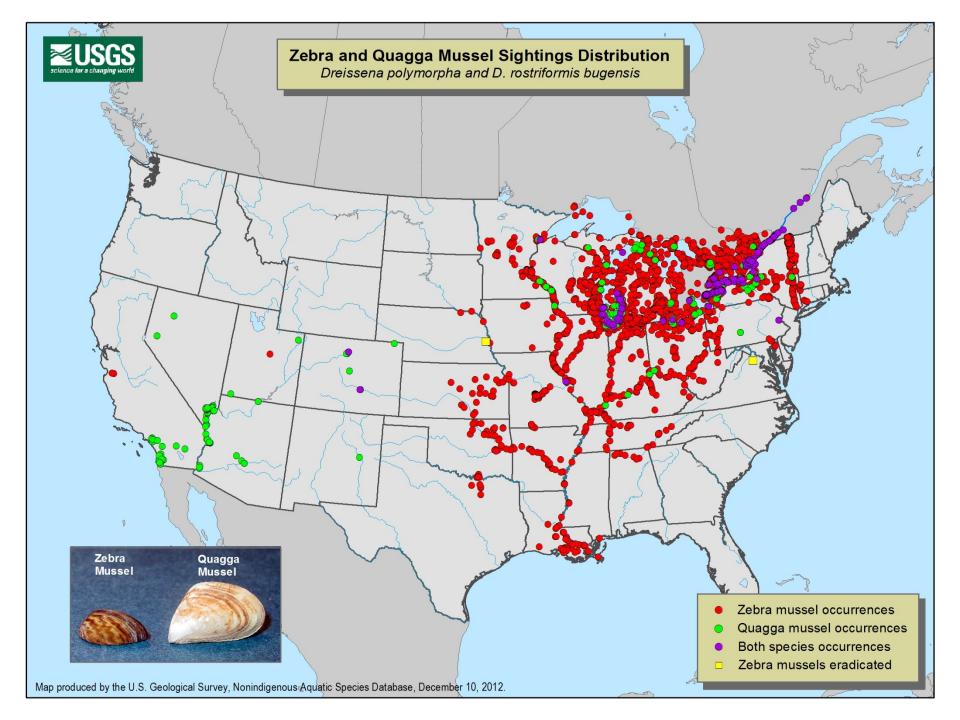


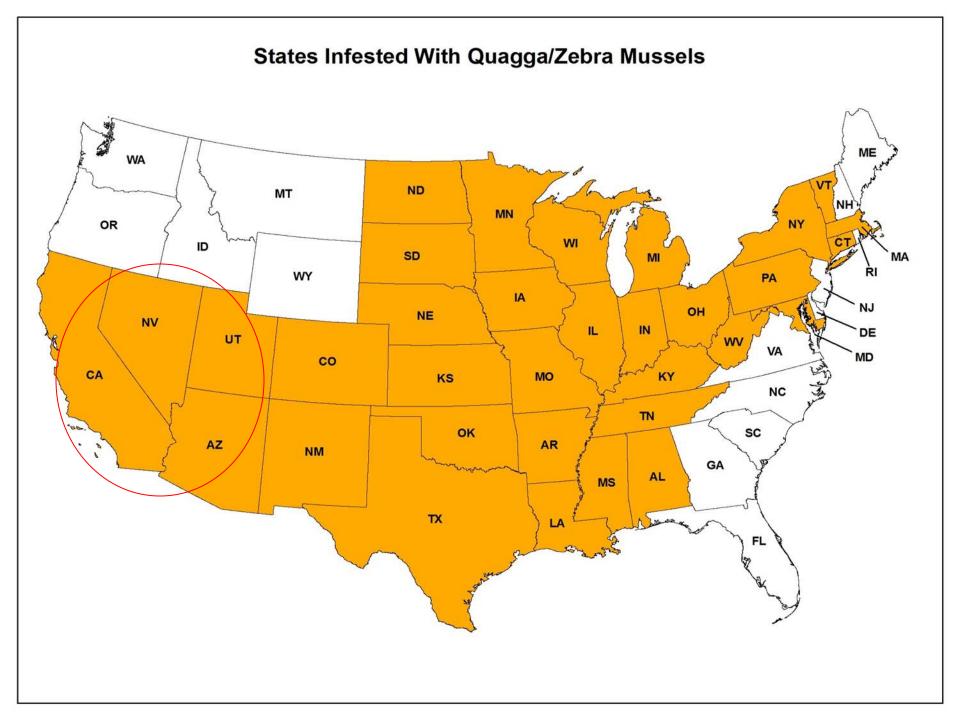
How are invasive species transported?

Hitch hiking!

- Boats & Trailers
- o Sea planes
- o Water trucks & pumps
- o Water-related construction equipment
- o Ballast Water
- o Aquarium Releases
- o Wading Gear

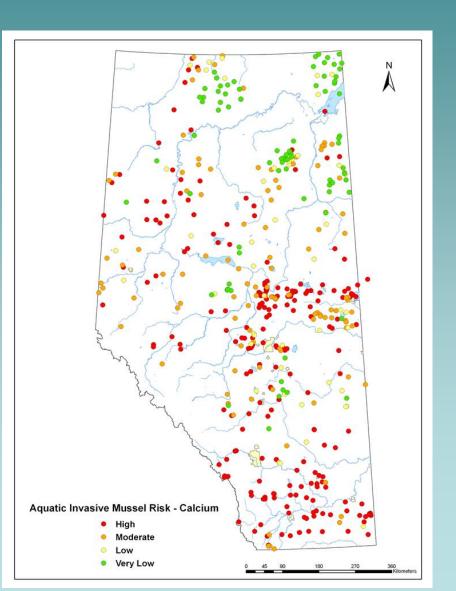




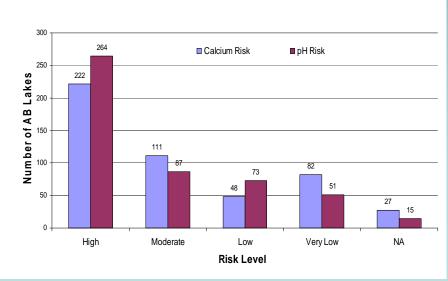




Will mussels like it here?







Zurawell, R. Dreissenid Mussel Establishment Risk Map. June 2013



Economic Impact:



Estimated annual costs of an invasive mussel infestation in Alberta

Impact category	Annual cost
Power generation	\$5,938,487
Drinking water systems	\$20,839,921
Boat maintenance	\$390,600
Recreational fishing	\$21,830,892
Water management structures	\$1,793,500
Water diversion intakes	\$1,797,500
Lakefront property	\$13,789,500
Non-use	No quantified at this time
Total	\$66,380,400

NEW! AIS prevention program in Alberta

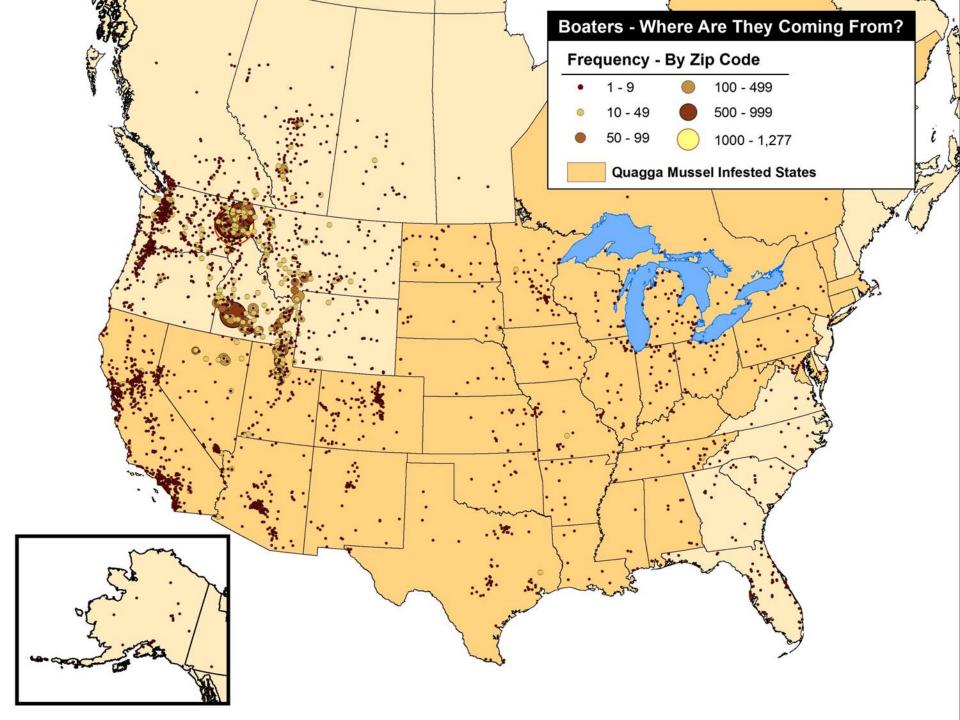
- Highest risk = recreational boaters
- Pilot project summer 2013
- Alberta AIS program in development
 - 1) Awareness and information
 - 2) Watercraft inspections
 - Milk River, Crowsnest, Cardston
 - 3) Monitoring and reporting
 - 4) Emergency response
 - 1-855-336-BOAT
 - 5) Legislation and policy
 - Provincial
 - Federal











Monitoring for mussels

- Juveniles (veliger sampling) & adult (artificial substrates) mussel monitoring
- Summer 2013: existing efforts (40+ waterbodies)
- Next steps:
 - Explore options for analysis
 - Add boat traffic data
 - Build partnerships
 - Explore addition of aquatic plants & invertebrates









AIS response protocol for Alberta



1-855-336-BOAT

Radio Control Center

Inquiry

ESRD Info Center/ AIS Coordinator Fisheries Officer (FWO, CO, etc.)

Support from decontamination staff

AIS ALERT: ESRD, AARD, SolGen, TPR, CBSA, Parks Canada

1-855-336-BOAT

Current Policy

Alberta Weed Control Act

6: Eurasian watermilfoil (prohibited noxious weed)



- 42: Zebra Mussels (Restricted possession)
- 32(2): Threats to fish health
 - Ministerial Order



THE Ministerial Order

- Quagga and zebra mussels
- Authority to stop, inspect, decontaminate, quarantine
 - Fish & Wildlife Officers
 - Parks Conservation Officers
 - Forestry Officers
 - RCMP
 - Commercial Vehicle Inspectors*
 - Traffic Sheriffs*
- Federal DFO regulations proposed



Environment and Sustainable

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ENVIRONMENT AND SUSTAINABLE RESOURCE DEVELOPMENT

Fisheries (Alberta) Act RSA 2000, Chapter F-16

MINISTERIAL ORDER

34/2013

SPECIFIED SPECIES QUARANTINE ORDER

I, Dana Woodworth, Deputy Minister of Environment and Sustainable Resource Development find that:

Fish identified as specified species in this Order pose an ecological threat to other fish in Alberta;

the protection of Alberta's waters from contamination by a specified species is in the public interest;

specified species have infested the fisheries of other North American jurisdictions leading to unwanted changes in natural habitats;

a vehicle, aircraft, boat or other watercraft or railway car that has been in contact with a specified species is at risk of introducing said specified species into Alberta's fisheries;

Alberta's fisheries are at risk of infestation by specified species; and,

therefore, pursuant to sections 32(2), 32(3) and 33 of the Fisheries (Alberta) Act, RSA 2000, c F-16, make the order in the attached Appendix, being the Specified Species Quarantine Order.

Dana Woodworth
Deputy Minister of Environment and
Sustainable Resource Development



What are our neighbours doing? MANDATORY WATERCRAF INSPECTION Kotcho L TURN HERE Williston L Natalkuz L **H**ungry Horse Charlotte L Horsefly L Kinbasket L Owikeno L Tatlayoko L Chilko L Adams L Campbell L Lillooet L Okanagan L Harrison I Great Central I Cowichan I Arrow Lakes Slocan L 50 KM 50 Miles

The time to act is NOW

- Huge impacts = huge costs to province
- Prevention is key
- 30+ high risk boats in 2013
- Response protocol is essential
- Currently in development:
 - Province-wide program
 - AWC AIS project
 - Decontamination protocol
 - Partnership opportunities
 - Approach to boat inspections





