

ZEBRA & QUAGGA MUSSELS

These freshwater bivalves are native to the Black Sea region of Eurasia. They were first introduced to the Great Lakes in the late 1980s by trans-Atlantic ships discharging ballast water that contained adult or larval mussels. They spread widely and as of 2019, can be found in Ontario, Quebec, Manitoba, and at least 24 American states.

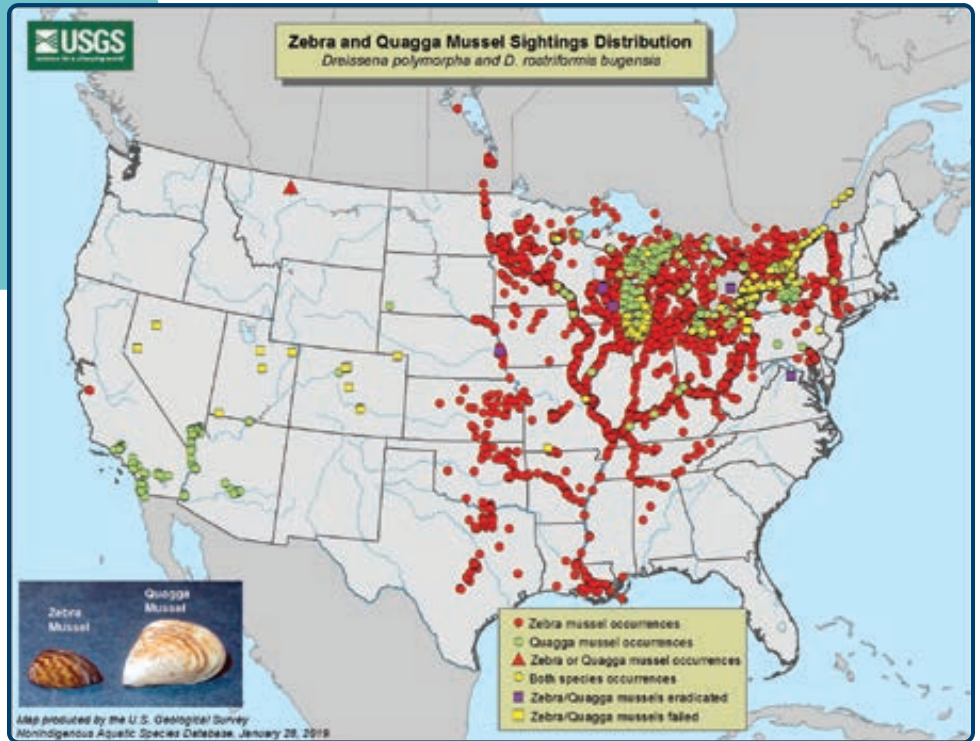
Though zebra and quagga mussels have not yet been detected in the waters of BC, Saskatchewan, Alberta, or the territories, the threat of introducing these invasive species to Yukon waters is real!

Identification

Zebra and quagga mussels — or dreissenid mussels — look very similar. Quagga mussels are slightly larger, rounder, and wider than zebra mussels, which are about the size of a fingernail. Both species range in colour from black, cream, or white, with varying amounts of banding. Both mussels also possess byssal threads, which are strong fibers that allow the mussel to attach itself to hard surfaces; these are lacking in the Yukon's native mussel, the Yukon Floater. The Yukon Floater does not attach to surfaces like the invasive dreissenid mussels do.

Ecological Characteristics

Habitat: Zebra mussels are very adaptable and can survive in a wide range of environmental conditions. They can be found in near shore areas out to a depth of 110 metres, while quagga mussels may be as deep at 130 metres.



Zebra and quagga mussels prefer depths of 2-12 metres and 10-30 metres respectively, in freshwater lakes, rivers, reservoirs, ponds, and quarries, but have been reported in brackish waters as well.

Reproduction: Females can produce up to one million eggs each year. Fertilized eggs hatch in water temperatures of 12 °C into free-floating veligers (larvae) within 2-3 weeks. These veligers produce a calcium-based shell and then settle on hard surfaces.

Dispersal: Dreissenid mussels may disperse naturally as free-swimming larvae with water currents or as adults attached to other organisms, aquatic infrastructure, or boats. The primary transport vector within North America is recreational boating.



Depending on the temperature and humidity, dreissenids can survive up to 30 days out of water.

Impacts

Ecological: Zebra and quagga mussels pose a serious threat to the biodiversity of aquatic ecosystems, competing for resources with native species like phytoplankton and zooplankton, which form the basis of aquatic food webs.

Zebra mussels selectively filter feed to remove large masses of certain green and brown algae, which results in toxic algal blooms that impact water quality and clarity.

Economic: Dreissenid mussels create massive colonies that can block water intakes and interfere with municipal water supplies, agricultural irrigation, and power plant operations. This often results in millions of dollars per year being allocated to removal and management. For example, the estimated impact of introducing invasive mussels to BC is projected to be at least \$43 million annually.

Social: Dreissenid mussel colonies can take over beaches, leaving the shoreline covered in razor sharp shells that render it unusable for recreational purposes. Algal blooms can also affect property values and tourism.



Did you know that 2 out of 5 boats entering Yukon come from jurisdictions that are home to zebra mussels?!

INVASIVE



≤ 3.5 cm

Amy Benson, U.S. Geological Survey, Bugwood.org

ZEBRA MUSSEL

Dreissena polymorpha

Shell Characteristics

D-shaped shell with variable light and dark banding. Fingernail sized shell is often about 0.5 cm wide and 2.5 cm long.

Distinguishing Features

Has bysall threads and will attach to hard surfaces. Has straight mid-ventral line and bilateral symmetry.

INVASIVE



≤ 4 cm

Amy Benson, U.S. Geological Survey, Bugwood.org

QUAGGA MUSSEL

D. rostriformis bugensis

Shell Characteristics

D-shaped shell is about 2cm long and may have banding that ranges from black, cream to white. Often paler toward the edge of the hinge. *space*

Distinguishing Features

Has bysall threads and will attach to hard surfaces. Is asymmetrical without a straight mid-ventral line.

NATIVE



≤ 15 cm

Matt Bowser

YUKON FLOATER

Anodonta beringiana

Shell Characteristics

Large shell varies in colour from dark brown in older adults to lighter brown or olive green in young mussels. Shell is more rounded in shape than many mussels.

Distinguishing Features

Gun-metal blue interior of shell. No bysall threads and does not attach to surfaces.

Practice:

CLEAN
plants, animals
and mud from
your boat and gear



DRAIN
your boat and
gear onto land



DRY all parts
of your boat and
gear completely



Rule of Thumb:
if it touches the water it
needs to be cleaned.



Prevention

Once established, invasive dreissenids are nearly impossible to fully eradicate from a water body. Prevention is the most effective solution to protecting waters from invasive mussels. You can help prevent these mussels from establishing by practicing **CLEAN DRAIN DRY**.

Remember, this goes for all types of watercraft and gear — motorboats and trailers, canoes, kayaks, rafts, paddle boards, paddles/oars, life jackets, etc.

Reporting in the Yukon

Early detection of aquatic invasive species is critical. Early detection of aquatic invasive species sightings to the Government of Yukon Fisheries Unit at 1-800-661-0408, ext. 5721 or fisheries@gov.yk.ca. If possible, take a photo, a sample for identification, and note the location.

YISC also encourages reporting using the iNaturalist app at [iNaturalist.ca](https://www.inaturalist.ca).

References & Links

- Canadian Council on Invasive Species. Clean Drain Dry. <https://canadainvasives.ca/programs/clean-drain-dry/>. Accessed 2021, April, 21
- Department of Environment. Aquatic Invasive Species. <https://yukon.ca/en/aquatic-invasive-species>. Accessed 2021, April, 21.
- Ministry of Environment. Mussel Defence Program. <https://www2.gov.bc.ca/content/invasive-mussels/invasive-mussel-defence-program>. Accessed 2018, August, 28.
- Therriault et al. 2012. Risk Assessment for Three Dreissenid Mussels (*Dreissena polymorpha*, *Dreissena rostriformis bugensis*, and *Mytilopsis leucophaeata*) in Canadian Freshwater. <http://www.dfo-mpo.gc.ca/library/348700.pdf>



Keeping Yukon Natural

For more information on aquatic invasive species in the Yukon, visit <https://www.yukoninvasives.com/index.php/en/take-action/clean-drain-dry>

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