



## Zebra Mussels

### What are zebra mussels?

Adult zebra mussels are small, freshwater mollusks (e.g.: clam-like organisms) named for their typical striped pattern on their shells. They are not native to Manitoba or North America. Adults have a shell and can range in size of a sesame seed and can grow up to 25 mm (1 in) long. Adult zebra mussel colour patterns can vary to the point of having only dark or light coloured shells and no stripes. Unlike our native mussels, zebra mussels attach themselves to solid surfaces, aquatic vegetation or each other with their byssal threads (Figure 1).



Figure 1. A cluster of adult zebra mussels attached to a rock.  
Photo credit: Manitoba Sustainable Development.

Larval zebra mussels are called veligers. They are so small they cannot be seen with the naked eye. Veligers are free-floating in the water and do not attach to hard surfaces until they reach the juvenile or shelled stage. Veligers do not swim on their own they move primarily by water movement. They can also be transported in undrained water found in watercraft, motors, and compartments or in water-related equipment such as bait buckets.

### Where did zebra mussels come from?

Zebra mussels are native to Eastern Europe and Western Russia. They were brought over to the Great Lakes in ballast water of ocean-going freighters. The ballast water containing aquatic invasive species such as zebra mussels was dumped into the Great Lakes. From there zebra mussels have been moved by human activity and have greatly expanded their range.



## **What are their breeding habits and life cycle?**

- Zebra mussels are prolific breeders. A female can produce up to a million eggs per year.
- Adults start to release eggs in spring when the water temperatures warm to 12°C
- The eggs are fertilized in water and become veligers (larval zebra mussels). Veligers may be in the water from late May through October.
- Veligers float in water for 2-3 weeks and can be moved by water currents throughout the water body. They are microscopic so cannot be seen with the naked eye.
- After 2-3 weeks veligers develop a shell and attach to any firm surface.
- Zebra mussels generally live 2-5 years.

## **What do zebra mussels eat?**

Zebra mussels are filter feeders, which means they strain small particles (plant plankton) from the water for food. Thousands of zebra mussels may consume so much plankton that there is not enough for the tiny microscopic animals (zooplankton) that young fish feed on to survive. A single zebra mussel can filter-feed one litre of water per day.

## **Does anything eat zebra mussels in Manitoba?**

Manitoba does not have any zebra mussels predators from their native range.

In North America, diving ducks can eat mussels. Fish species commonly found in Manitoba such as freshwater drum, lake sturgeon, channel catfish or common carp may learn to eat zebra mussels, even crayfish may also feed on them. However none of these Manitoban predators have evolved with zebra mussels. Generally these predators will not be able to eat enough to significantly reduce or eliminate zebra mussels from a water body.

## **How long can zebra mussels or veligers live out of the water?**

Zebra mussel veligers are fragile and generally die within minutes being out of water. Settled adult zebra mussels (the stage with a shell) attach to surfaces and can survive up to 30 days out of water depending on the air temperature and humidity. In the spring and fall when temperatures are cooler and there is more moisture in the air, adult zebra mussels can live extended period of time out of water.



## What problems do zebra mussels cause?

Zebra mussels can:

- impact fish populations
- increase water clarity, allowing sunlight to reach deeper into a water body which stimulates more aquatic plant growth and may lead to more frequent algal blooms
- clog water intake systems which results in increasing costs for industry, including power and water supply facilities
- reduce water-front property values of homes and cottages
- block cooling systems of watercraft engines, possibly causing engine damage
- starve and kill native mussels by attaching themselves in enormous numbers (Figure 2)
- interfere with swimming and beach-going by cutting the feet of swimmers and pets with their sharp-edged shells



Figure 2. Native mussel (forefront and lighter in colour) being starved by the attachment of numerous adult zebra mussels.

Photo credit: Manitoba Sustainable Development.

## How do zebra mussels impact fish populations?

From areas outside of Manitoba it has been found that zebra mussels interrupt the food chain which could negatively affect the growth and survivability of fish populations.



## **How are zebra mussels spread?**

Zebra mussels can be spread by many ways and by many different water-users. For example, zebra mussels can be moved by water-based aircraft, off-road vehicles, recreational and fishing equipment. The overland movement of watercraft and water-related equipment is the primary way aquatic invasive species such as zebra mussels move from one water body to another.

Larval zebra mussels, called veligers, are arguably the most concerning stage. Veligers cannot be seen but can be carried in water found in bait buckets, bilges, or any other water moved from an invaded water body to an un-invaded water body.

Adult zebra mussels can start to attach to submerged items in invaded water bodies such as watercraft hulls, nets, fenders, docks, swim platforms, boatlifts and aquatic plants - anything that is left in the water. Once attached, if not removed, adult zebra mussels can hitchhike on any of these items and be moved to new, un-invaded water bodies.

Items removed from a water body should be inspected by sight and touch. Very small adult zebra mussels attached to a surface, like the hull of a watercraft, can feel like sandpaper.

## **Where are zebra mussels found in Manitoba?**

In 2009, zebra mussels were found for the first time in the Red River watershed in Pelican Lake, Minnesota. In 2013 they were found in harbours in the south basin of Lake Winnipeg and are now considered established in the south basin. Zebra mussel veligers were found in the Manitoba portion of the Red River at Emerson Manitoba in June 2015 and in Cedar Lake by Grand Rapids, Manitoba the fall of the same year.

Zebra mussels are found in Lake Winnipeg, the Red River, Cedar Lake (by Grand Rapids) and possibly in Singush Lake in Duck Mountain Provincial Park.

## **If zebra mussels are in Manitoba now, isn't it too late to stop them?**

No, it's not too late to prevent the overland spread of zebra mussels to new water bodies. Preventing the spread of all aquatic invasive species such as zebra mussels can stop or delay unexpected economic costs to every Manitoban. Once zebra mussels establish they are nearly impossible to eradicate which can have permanent consequences to the enjoyment of the water body.



Everyone who uses Manitoba's water bodies must take personal responsibility and accountability for stopping the spread of aquatic invasive species such as zebra mussels. The steps Clean, Drain, Dry, Dispose, and if necessary Decontaminate, can prevent water bodies from being invaded. Stopping the spread will protect what we value about our water bodies.