



Zebra Mussels: Frequently Asked Questions: Published 01-04-2023

Friends of the Firesteel board members have been getting lots of questions about zebra mussels and how they may affect Lake Mitchell. We wanted to get science-based answers to these questions so we have compiled the questions and submitted them to Dave Lucchesi (SD Game Fish and Parks, Area Fisheries Supervisor) and Tanner Davis (SD Game Fish and Parks, Aquatic Invasive Species Coordinator) to get answers from the experts. Below are the questions and the answers.

Q: What does a Zebra Mussel look like and how can you tell if they have taken hold in a waterbody.

A: Below left is a photo of Zebra Mussels attached to rocks from Lake Cochrane and below right is a photo taken of the underside of a dock on Pickerel Lake. As you can see the right photo is a major infestation and the zebra mussels cover nearly every square inch of some attractive shallow surfaces such as the underside of a dock.



Q: Lake Mitchell seems to be clearer this year than recent past years. There were significant algae blooms in late June and early July but nothing really serious before and after that incident. Do you think that Zebra Mussels is why there were not more algae blooms before or after the June/July incident?

A: (Dave & Tanner) Water clarity was generally better than normal across much of southeastern South Dakota this summer. The dry spring and lack of nutrient-laden runoff from fields is most likely responsible for the improved water clarity. **Zebra mussels will consume blue-green algae, but typically select against it for other more palatable algae (i.e. green algae). Multiple studies have found an increase in blue green algae after the introduction of zebra mussels.** If you consistently had fewer, less severe blue green algal bloom over a 5–10-year period, especially if this is in contrast to the intensity of algal blooms elsewhere, then one might conclude that zebra mussels could be responsible for altering nutrient levels or some other dynamic and are impacting water clarity.



Q: Zebra Mussels eat green algae, not necessarily blue green algae. Is this a true statement? And Blue Green algae is the algae that is a problem on Lake Mitchell?

A: (Dave) Those statements are all true, except that they have been found to consume blue-green algae, but tend to select for green algae when available. Multiple studies have found an increase in blue green algae after the introduction of Zebra Mussels. *(SD GFP Wildlife Division Report 2021 Pg 14)

Q: Can Zebra Mussels Clean a Lake?

A: (Tanner) I would never advocate introducing zebra mussels into a system to aide in water quality. Zebra mussels do not “clean” a waterbody. They simply redirect available suspended solids to be more bioavailable near the lake floor or benthic layer of the water column. Zebra mussels present a few potential benefits to a system but overall, they are not or should not be a welcomed invasive species to any system.

Q: We know that Lake Mitchell has Zebra Mussels but we have yet to see any concentration of Zebra Mussels. Do you believe that this lake will become dominated by Zebra Mussels?

A: (Dave) I can only speculate here. I am surprised that large concentrations or “druses” of zebra mussels have not been found in Lake Mitchell given that they have been in the lake for several years and individuals have been found all the way from the upper to lower ends. Mike Hawkins, the Iowa fisheries biologist who gave the lake restoration presentation you attended last winter, mentioned that zebra mussel densities in some Iowa lakes are low and attributed that to the soft, mucky lake bottoms which are not a suitable substrate for zebra mussel colonization. Water clarity and light penetration can also impact the severity of infestations with dingier waters having lower zebra mussel densities. If you string two clear water summers together, maybe you will see an increase in zebra mussel density or maybe not! Response to infestation varies by water body and over time. Only time will tell!

Q: Do zebra mussels tend to live in shallow or deep parts of a water body?

A: Zebra mussels tend to live on structure so if the only structure in a water body is rock on the shores, docks, lifts, pump intake structures, and boats moored in the water close to shore then that is where the Zebra Mussels will predominately attach to and live.

Q: Are there other impacts good or bad with Zebra Mussels predominantly living in the shallower waters?

A: There is the impact of getting major concentrations of Zebra Mussels in an around beaches, docks, and access areas that can limit the safe use of those areas. People tend to cut their feet on the shells when swimming in areas of high mussel concentration. **Also, Zebra mussels can increase the level of phosphorous in these shallow areas as they filter algae but then defecate in this same area. This releases more phosphorous for further algae growth and consumption in the shallow areas.** If Zebra mussels do filter the water to a clearer state, there is the possibility that aquatic plants will fill into areas where sunlight now is able to reach the lake bottom. Zebra mussels often attach to aquatic plants so multiple issues can be created in shallow areas if Zebra mussels take hold.

Q: Will a lake lowering draw down structure, limit the growth of zebra mussels?

A: Assuming the draw down is used to drop the lake level in the fall by a foot or two, then yes, a lake lowering device could have a positive impact on limiting the growth of Zebra Mussels because lowering the water level is lessening the structure that the Zebra Mussels can attach to and not freeze during the winter. A freeze of exposed mussels will kill them.

Q: Based on other lakes that you have seen with Zebra Mussels; how does Lake Mitchell compare?

A: (Dave) The infestation on Lake Mitchell is light when compared to infestations in many other waters including Pickerel Lake, Lewis and Clark Lake, and Lake Sharpe. Zebra mussels are also denser on Lakes Cochrane and Kampeska. The newly reported infestations in Enemy Swim, Blue Dog, Clear Lake, and Pactola are in their infancy, but my guess would be that with the clear water and hard substrates of Enemy Swim, Clear and Pactola, those infestations have the potential to become quite dense.

A: (Tanner) Currently, Pickerel Lake, Lake Kampeska, and the Missouri River around West Bend on Lake Sharpe and downstream (Lake Francis Case, Lewis and Clark, and below Gavins Point Dam) would have the highest concentrations of zebra mussels. Lake Cochrane has been infested since 2020 and this year was the first-year reports have come back indicating an increase in density and lake homeowners reported people cutting their feet when recreating. Enemy Swim has only had 4 mussels reported so far, but this is the first year we have found any in the lake. Blue Dog docks were coming back with roughly 2-12 mussels on docks we inspected. South Rush has very few docks and staff were only able to find two mussels this year in the lake. We decontaminated 38 mussel fouled boats on Lake Pactola that were moored there all summer and renting a slip for the season. Boats had anywhere from 1-12 mussels on them on average, but we did have a boat with roughly 50 mussels on it. These mussels were all juvenile mussels that started mussel formation this year. As Dave mentioned, time will tell for what zebra mussel densities will look like on waterbodies recently found to be infested as each waterbody is unique.



Lake Francis Case: Zebra mussels concentrated on rock.

Additional Zebra Mussel Photos



Juvenile Mussels on Freshwater Clam



Zebra Mussels on Aquatic Plants



Adult Zebra Mussel: Size of Quarter