The Effect of Margaritifera margaritifera on Nitrates in Hastings NE

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Our area is very agriculturally centered and various chemicals find their way into our water affecting our drinking water. Hastings, Nebraska will soon have to deal with a large plume of nitrate rich water entering the well area and has been taking measures to pump high nitrate water into storage lagoons where it can be treated. In August of 2018, a sample from a Hastings Municipal water well was tested for nitrates. It was tested and found to have 10.7 ppm nitrates. The federal standard for nitrates in drinking water is not to exceed 10 ppm. In an experiment conducted in New York state, scientists studied the ability of freshwater mussels (bivalves) to filter water and reduce particulate matter. They discovered the mussels could remove a substantial amount of particulate matter in a short period of time. Since freshwater mussels can filter large amounts of water, we were interested if mussels could also remove nitrates from local ponds. We collected water from three locations around the Hastings, Nebraska. We also collected high nitrate water samples from test well in Hastings Utilities. We added three mussels to water samples from each source. We also set aside a water sample from each location as a control. We measured conductivity, nitrates, pH, and dissolved oxygen to understand the mussels effect on the water quality. We concluded that these mussels successfully filter most particulate matter and are are able to reduce nitrates in all water samples. The use of mussels could be applied as a cost effective and environmentally healthy way to treat high nitrate water from waterways.

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