



**GRAND COUNCIL
TREATY #3**
The GOVERNMENT of THE ANISHINAABE NATION in TREATY #3



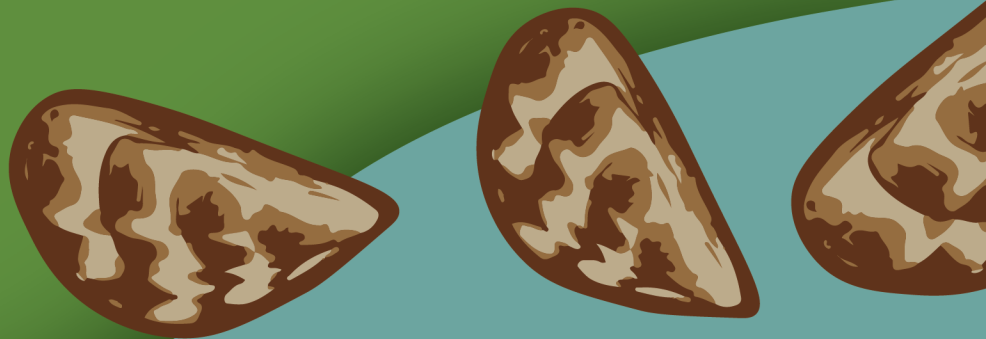
**Invasive
Species
Centre**

ENVIRONMENTAL MONITORING SUMMARY REPORT

2024 Invasive Species Monitoring: Zebra Mussels
**REPORT PREPARED BY THE TERRITORIAL PLANNING UNIT OF
GRAND COUNCIL TREATY #3**

REPORT PREPARED:

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**PLEASE DIRECT ANY QUESTIONS OR COMMENTS REGARDING THE CONTENT IN THIS
REPORT TO MICHAELA NOVAK, MICHAELA.NOVAK@TREATY3.CA.**

Why We Monitor

The Grand Council Treaty #3 Territorial Planning Unit (TPU) coordinates invasive Zebra Mussel monitoring across the Treaty #3 territory, following the guidance and traditional protocols of the Treaty #3 communities within the territory. The TPU works to protect, conserve, and defend the traditional lands and waters of the Anishinaabe Nation of Treaty #3.



WHAT IS A ZEBRA MUSSEL?

Invasive Zebra Mussels (*Dreissena polymorpha*) are small, striped freshwater mollusks that were introduced to Canada from the Eurasian Seas in the 1980's. Zebra Mussels have two life stages; veligers (larvae) and adults. While veligers are microscopic, adults can grow up to 5cm during their 15-year lifespan.

By the time they are one year in age, females can release upwards of one million eggs each spawning season. In the span of one month, the developing veligers drift to new locations and can quickly spread throughout any connected waterbodies. The Zebra Mussels use their foot equipped with a cluster of long strands called byssal threads to help them secure a strong attachment to underwater structures, often outcompeting native freshwater mussels, predators, and removal methods (Non-Native Species Secretariat, 2018).

WHAT ARE THE IMPACTS CAUSED BY ZEBRA MUSSELS?

Zebra Mussels that have successfully spread into lakes and rivers can have significant environmental impacts. As filter feeders, they often remove phytoplankton from the waterbody, which severely diminishes a critical food source for many local species. Even more, toxins that they filter from the water are retained in their tissues and can end up causing illnesses in predators that consume them.

Their high reproductive rate and strong foot attachment allows for a rapid infestation causing biofouling, such as coverage of boat hulls and blockages in water pipes. Their microscopic size during the veliger stage allows them to pass through small openings, including intake pipe filters.

WHERE ARE ZEBRA MUSSELS FOUND?

Invasive Zebra Mussels are a threat faced by ecosystems worldwide. No waterbodies in the Treaty #3 territory are confirmed hosts to established populations*, but waterbodies surrounding the territory are Lake Winnipeg, Lake Superior, and several in Minnesota. The detection of veliger presence within the territory began in 2018 when a single veliger was found in Shoal Lake, followed by the U.S. portions of Lake of the Woods and Rainy Lake in 2019 and 2021. In 2023, the TPU found a single veliger in Christie Creek, a tributary of Rainy Lake.

A waterbody is deemed to host an established population of Zebra Mussels when there are veligers and reproductively capable adults present. A population ranging in ages indicates that the species' requirements are met, and the habitat can sustain Zebra Mussels throughout their lifecycle (from development to reproduction). As requirements change throughout a mussel's

* Includes Canadian portions of binational waterbodies. While no established populations were identified in the transboundary waters, the Minnesota Department of Natural Resources has confirmed establishment of Zebra Mussel population(s) in the Rainy-Lake of the Woods basin since 2013.

lifetime, certain habitats may only be able to support a specific life stage, for example, **a waterbody may have confirmed Zebra Mussel presence but not an established population of Zebra Mussels.**

HOW CAN INVASIVE ZEBRA MUSSELS BE CONTROLLED?

The removal of Zebra Mussels is very difficult. Physical removal requires scraping off the mussels from the substrate, with caution taken to ensure the removed mussels do not re-enter the waterbody from which they were removed or enter a new one. While the introduction to a new waterbody must occur within 5 days for optimal reproductive viability, adult Zebra Mussels can seal their shells and survive up to 30 days of air exposure (Province of Manitoba, 2023; Fisheries and Oceans Canada, 2023). High-pressure and high-temperature washing of the boat hull immediately after it is unlaunched strongly decreases the spread potential of invasive species. All gear and equipment (e.g., fishing rods, life preservers, live wells and bait buckets, paddles/oars, trailers, trolling motors and props) that are exposed to the waterbody should be decontaminated this way.

How We Monitor

OUR MONITORING METHODS



In 2024, the TPU visited sites across Treaty #3 and collected samples using an 80 micron mesh plankton net that was towed through the

water. Methods for collection included vertical tows for depths greater than 7m, horizontal tows for depths less than 7m, and shoreline tosses for any tows that required a greater length. All the net tows were pulled at a speed of ~1m per second. The TPU collected samples in early summer and fall, when the water temperatures were optimal for Zebra Mussel reproduction.

The TPU prioritized sample areas in Treaty #3 communities, as well as high-traffic public boat launches and docks. Treaty #3 communities were considered a priority due to potential impacts on community infrastructures, whereas high-traffic public boat launches and docks were considered a priority due to their potential to act as an entry point for Zebra Mussel veligers into Treaty #3 waters. Last year, in fall 2023, the TPU detected Zebra Mussel presence in Rainy Lake when a single veliger was found in a tributary of Rainy Lake; therefore, the 2024 sampling prioritized Rainy Lake and other nearby binational waterbodies. Whenever possible, Treaty #3 youth and other youth groups participated in the sample collection process. All samples collected in 2024 were sent to the Invasive Species Centre (ISC) to test for the presence of invasive Zebra Mussel veligers.

Note: all samples were analyzed for presence of Zebra Mussel veligers and/or Spiny Waterfleas (*Bythotrephes longimanus*). While this report will highlight and discuss all the results, the spread of Spiny Waterfleas is well documented; therefore, a focus is placed on the monitoring of zebra mussels.

2024 INVASIVE SPECIES MONITORING REPORT: ZEBRA MUSSELS



The photos above were taken during the 2023 and 2024 monitoring seasons and show the TPU staff completing monitoring efforts with help from the MNRF Youth Rangers. Not only were these youth supporting the collection of samples for aquatic invasive species testing, but they also helped gather water chemistry data from the testing sites.

SETTING UP SAFE MONITORING PROTOCOLS

To ensure monitoring efforts are safe and productive, the TPU utilized two different sanitation methods to kill and remove potential Zebra Mussel veligers on the monitoring equipment. These methods are the hot water method, and the vinegar method.

The hot water method submerges all equipment in hot water ($>60^{\circ}\text{C}$) for at least 10 minutes. The TPU used this method when moving between waterbodies, and between each sample collection day, including when the equipment was returning to the same waterbody upon its next use.

The vinegar method submerges all equipment in a 5% acetic acid solution (white vinegar) for a minimum of 24 hours, followed by a thorough rinse with water. This method was used between sampling in each of the four Treaty #3 geographic directions, and between the summer and fall rounds of collection.

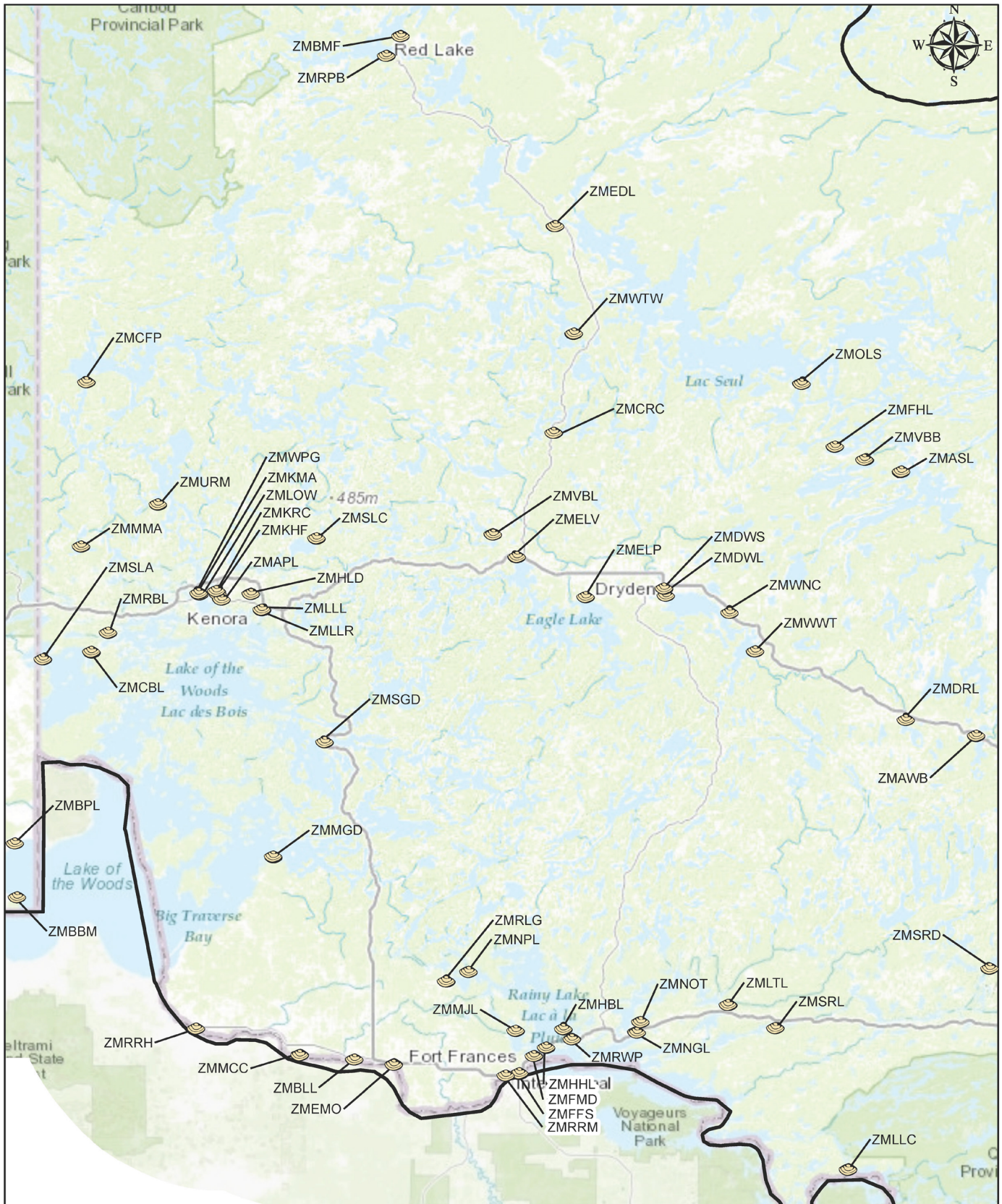
Findings

RESULTS OF THE 2024 MONITORING EFFORTS

Between June 18 and October 2, 2024, the TPU collected 103 samples from 58 unique sites across 31 waterbodies within the Treaty #3 territory. The samples were sent to the ISC for visual analysis to confirm the presence of Zebra Mussel veligers. Due to issues in the shipping process, 90 samples were analyzed. 13 samples, collected between June and July, were compromised and unable to analyze; the majority of these sites were resampled in the fall. The analyses returned favourable results; **zero Zebra Mussel veligers were identified in the samples**. Due to the 13 compromised containers, some sites had only partial samples analyzed.

A full, in-depth 2024 Zebra Mussel Monitoring Report, complete with a results table for all samples, is also available to view or download [here](#). For any further inquiries about the results, or to inquire about the sites tested, email Michaela.Novak@treaty3.ca.

2024 INVASIVE SPECIES MONITORING REPORT: ZEBRA MUSSELS



Zebra Mussel Veliger Testing Locations - 2024

0 25 50 100
Kilometers



Map Created By: GCT3, GIS Specialist, R. Parsons
 Map Created: January 14, 2024
 Coordinate System: NAD 1983 UTM 15N
 Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Conclusion

SUMMARY OF THE 2023 MONITORING SEASON

Over the course of the 2024 monitoring season, the TPU sampled 31 waterbodies across Treaty #3 for the presence of invasive Zebra Mussels and Spiny Waterfleas. Ultimately, the Invasive Species Centre's laboratory analyzed 90 samples from 57 unique sites. No Zebra Mussel veligers were identified in the samples. 17 samples, collected from 9 waterbodies, were positive for presence of Spiny Waterfleas. All waterbodies with positive results are known as hosts; no new introductions of Spiny Waterfleas were identified.

WHAT DO THE RESULTS MEAN?

While zero detections of Zebra Mussel veligers is the desired result, it is not definitive evidence that there are zero present in the sampled waterbody. A single negative result relates solely to the sample; a waterbody can host Zebra Mussels and receive a negative test result if no individuals are caught during the sampling process. In addition, a positive veliger sample result does not definitively indicate a successful introduction/invasion; reproductively capable adults must be found as well. Adult Zebra Mussels were not the target of the experiment and therefore not identified at any site.

NEXT STEPS & FUTURE MONITORING EFFORTS

Further efforts are required concerning invasive species in Treaty #3. The TPU continues to expand and increase monitoring in waterbodies across the territory for adult Zebra Mussels and veligers. While the TPU's 2024 sampling results were negative, the 2023 results found the first confirmed veliger in the Canadian portion of Rainy Lake. The origin of the veliger remains unknown; possibilities include an undiscovered established population of invasive Zebra Mussels active in the Minnesota portion or attachment to a watercraft that travelled through. The TPU will continue to sample for the presence of invasive Zebra Mussels, prioritizing Treaty #3 communities, and high-risk potential introduction locations (e.g., public boat launches, binational waterbodies).

To increase the prevention and reduce the spread of aquatic invasive species within Treaty #3, the TPU will install and maintain three decontamination units (i.e. boat wash stations) between the hub cities over the next few years. This upcoming summer, 2025, the TPU will deploy the first unit in the Kenora area. TPU staff and trained volunteers will operate the unit, and its use will be free of charge.

The TPU is progressing in the creation an information booklet of the invasive species present within the Treaty #3 territory! The booklet will be available in both Anishinaabemowin and English languages, and is on-track for release in summer 2025. Increased education on the pathways and the impacts of invasive species is required to prevent and slow their spread. As opportunities arise, the TPU will continue taking on new projects, partnerships, and monitoring methods as directed by the Nation.

Review the full 2024 Zebra Mussels Monitoring Report [here](#). For any further inquiries, please email the TPU's Invasive Species Coordinator, Michaela.Novak@treaty3.ca