

# Midwest Partners in Amphibian and Reptile Conservation (MWPARC) Student Travel Grant Report 2024

**Awardee:** Alyssa Roberts

**Professional association:** St. Cloud State University

**In one or two paragraphs, describe the work you participated in that was facilitated by this award.**

I used environmental DNA (eDNA) survey methods to detect the Four-toed salamander (*Hemidactylium scutatum*). I compared this method with survey methods traditionally used to detect this species while collaborating with the Minnesota Department of Natural Resources (MNDNR). This study took place at 27 wetland sites across Northeastern Minnesota. Water samples were collected and filtered on-site at each wetland during the salamander's nesting and larval seasons. Following eDNA sample collection, traditional survey methods were conducted. Traditional nest search surveys took place in the spring (late April – early June), and larval surveys took place in the summer (late June – July). The money provided from this travel grant helped me travel to field sites to collect traditional survey data during the 2024 nesting season.



Using a novel species-specific assay that I developed, I performed qPCR to detect and amplify *H. scutatum* DNA fragments if present in water samples. I used Bayesian occupancy modeling to compare traditional methods to eDNA methods during the nesting season with several covariates. Larval season analyses were limited due to most of the wetlands having dried before larval surveys could take place. I learned that capturing eDNA from a wetland during the nesting season results in low detection probabilities for this species. We can improve detection by increasing the number of water samples collected from wetlands, and the number of replicates used during qPCR. These results could possibly lead to a better understanding of how to use eDNA to detect an elusive species of salamander in Minnesota.

**How has this work aided you in achieving your career goals?**

Working on this project has allowed me to improve my collaboration skills while working with professionals of a government agency. This work has also allowed me to add to my field and lab skill sets, including field study design, measuring and describing aspects of wildlife habitats, developing and understanding eDNA methods, and analyzing datasets. I truly appreciate the support MWPARC has given me to achieve these goals.

**Image description:** Alyssa holds a Four-toed Salamander.