

MWPARC Travel Grant Recipient: Michelle Souza, Eastern Michigan University

Advisor: Dr. Katherine Greenwald, Eastern Michigan University

Thanks in part to funding from the MWPARC Travel Grant, I was able to complete the field work component of my research which investigates the impact of habitat isolation on genetic diversity in Marbled Salamanders (*Ambystoma opacum*) on Kelleys Island. This season I was able to collect photographic and tissue samples from 35 salamanders. The tissue samples will be used to compare the genetic data from samples collected in 2005 to examine changes in effective population size and other metrics of genetic diversity. We are investigating adverse genetic effects such as inbreeding and genetic drift caused by isolation, fragmentation, and habitat degradation. The photographic images will be used as part of a mark-recapture study to estimate census population size, sex ratio, and juvenile recruitment.

Fieldwork was conducted in May, June, and July, at Kelleys Island State Park. The Park has mature deciduous forest with wetlands that allow for breeding; marbled salamander larvae overwinter in the pond and complete metamorphosis in spring and summer. Adult salamanders live in the adjacent forests in burrows and under rock slabs and logs. Searches were conducted in wetland adjacent woodlands at the same locations as searches conducted in 2005, by flipping cover objects. An on-site field station was set-up, consisting of tissue sampling and photography stations. A photo box was built with a reflective backdrop and LED lights to limit glare. Once individuals were collected, biometric data, photographs, and tissue samples were taken, before returning them to the field.

Images will be processed using I3S (Interactive Individual Identification System) program Straighten (v. 1.0) and Pattern+ (v. 4.1). Double digest Restriction-Site Associated DNA sequencing (ddRADseq) will be used to genotype individuals of the two temporally sampled populations. This research will allow us to determine the long-term viability of population and assessing its probability of extinction. From this study we will show how the temporal re-sampling of an isolated population with no immigration can provide evidence of genetic changes that have occurred due to isolation which can inform management of peripheral populations with potentially unique adaptations. I am grateful for the support of my research, and I look forward to presenting my findings in the future.



Field collected Marbled salamanders awaiting processing.



CMR image of adult male Marbled Salamander.



CMR image of juvenile female Marbled Salamander.



Weight collection of adult female Marbled Salamander.



Snout-vent length collection of juvenile female Marbled Salamander.



Tail tissue sample collection from adult male Marbled Salamander.



Tail tissue sample collection from adult female Marbled Salamander.



Tail tissue sample stored in microtube of 95% ethanol solution.

