

Mudpuppy (*Necturus maculosus*) Assessment and Habitat Restoration along the Huron-Erie Corridor: Conservation of the Obligate Host for the Endangered Salamander Mussel (*Simpsonaias ambigua*)

¹Amanda Bryant, ¹Megan English, ²Dr. Katherine Greenwald, ³Richard Kik IV, ²Dana Leigh, ¹David Mifsud, ¹Maegan Stapleton, ²Amber Stedman, ¹Sean Zera

¹Herpetological Resource and Management, ²Eastern Michigan University, ³Belle Isle Aquarium

Introduction

We will survey Mudpuppy populations along the Huron to Erie Corridor (HEC) in order to assess the effects of habitat fragmentation. This monitoring will also measure the effectiveness of ongoing restoration efforts in addition to implementing new restoration activities.

Objectives

1. Determine spatial distribution, abundance, health and population genetic structure along the assessment area
2. Assess whether physical barriers or factors impede Mudpuppy dispersal
3. Evaluate the efficacy of eDNA as a Mudpuppy survey technique
4. Evaluate success of ongoing restoration and implement new restoration projects
5. Increase public awareness of Mudpuppies as an indicator species

Habitat Restoration

Goal:

Implementation of rocky habitat structures critical for Mudpuppy breeding and refugia to increase local population size and support long-term viability

Locations:

- Lake St. Clair Metropark and Lake Erie Metropark for pre- and post-restoration analysis
- St. Clair River (Port Huron) and Belle Isle (Detroit) for comparison to previously restored locations



Jay Redbond

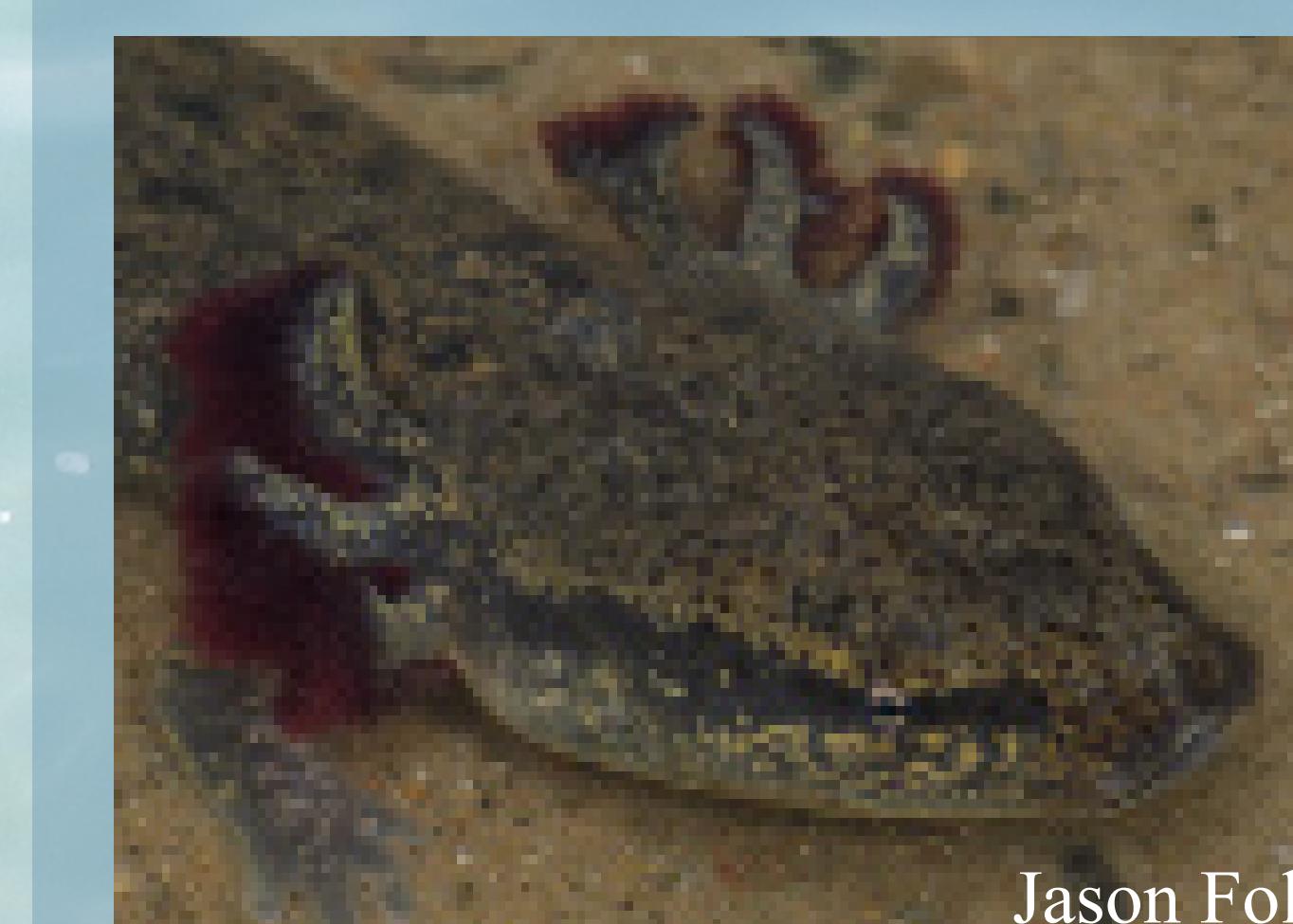
Population Genetic Assessment

Goal:

Characterization of current genetic structure of populations at local and broad geographic scales and evaluation of utility of eDNA surveys

Field Sites:

- Huron River-characterization of local population genetic structure
- HEC and surrounding Midwest region-characterization of broad population genetic structure



Target Species

General Characteristics/Ecological Importance

- Michigan's largest salamander
- Fully aquatic
- Long-lived
- Environmental quality indicator
- Obligate host for *S. ambigua*

Habitat

- Permanent bodies of cold water
- Hidden under large rocks, logs, and other objects

Status

- Historically abundant with significant recent declines including mass die-offs
- Species of Greatest Conservation Need (SGCN) in MI, WI, & MN
- Proposed for elevation to Special Concern in MI

Causes of Decline

- Habitat loss/alteration
- Lampricide application

Initial Results

- 2014 - 2015: Nearly 40 sites and 170 trap locations yielded 21 Mudpuppies from 7 separate sites
- Multiple individuals found in the St. Clair River at established and newly restored locations
- Consistent with previous genetic studies, overall sequence diversity was found to be low. Most diversity found among populations, indicating sampled areas experience low levels of migration

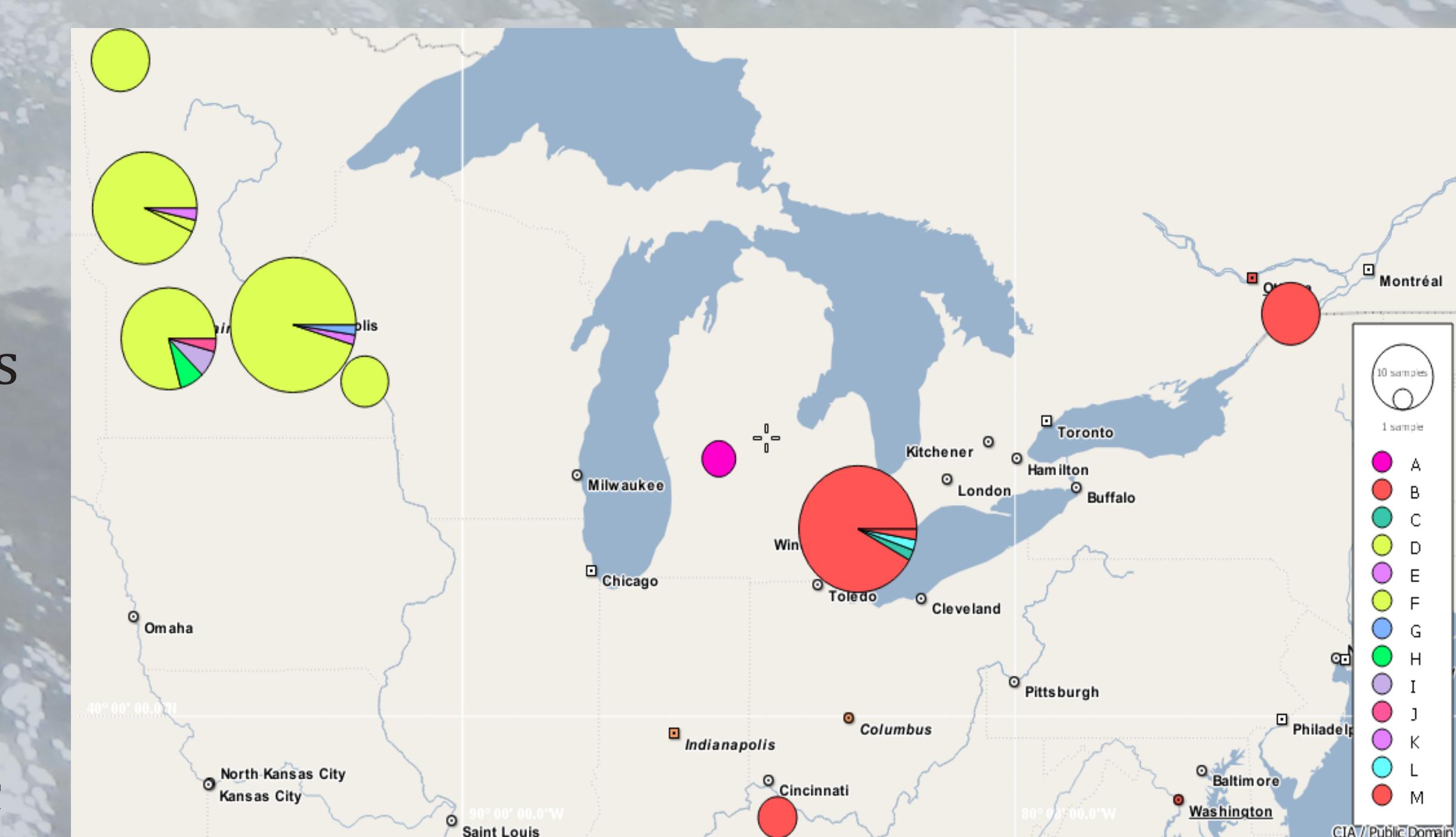


Figure 1. Haplotype diversity at nine sampling locations. Oval size is proportional; to sample size. Numbers refer to pairwise Fst groupings.

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