

# The Importance Of Atlasing; Utilizing Amphibian And Reptile Data To Protect And Restore Michigan Wetlands



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# Michigan Wetlands and Herpetofauna

- Wetlands support a wealth of biodiversity such as the amphibians and reptiles that rely on them for survival.
- Michigan contains expansive areas of wetland including several that are considered unique to this region.
- These habitats are becoming rare due to habitat loss and degradation and require protection and management.
- The presence and distribution of herpetofauna on a landscape can be used as a tool for prioritizing wetland protection as well as monitoring the health of these special Great Lakes ecosystems.



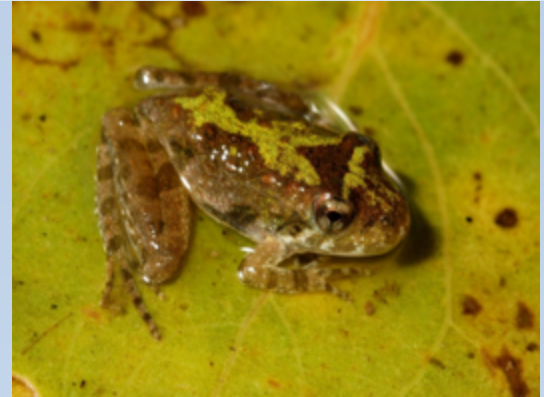


# Why are Herps Important to Wetlands?



# Their Role

- Critical components of aquatic and terrestrial systems.
- Fill niche roles essential to the maintenance of biodiversity and ecological functionality.
- Mid-level position in food web and indicator species.
- Consume exotic and invasive species.
- Species richness, density, age class, and distribution can be used to assess health of ecosystems and evaluate need for and success of restoration projects.





# Biphasic

- Aquatic and terrestrial life stages.
- Most rely on the presence of water for at least one life cycle stage (larval stage, breeding, etc.).



# Complex habitat requirements

- Many are seasonally wetland dependent.
- Necessitate the protection of habitat blocks with mosaics of different wetland types and adjacent intact upland habitat.
- Restoring landscapes to meet needs of herpetofauna creates balanced, healthy ecosystems.







# Nearly 60 Species of Herpetofauna in Michigan

- 14 Species of Salamanders
- 14 Species of Frogs and Toads
- 11 Species of Turtles
- 2 Species of Lizards
- 18 Species Snakes





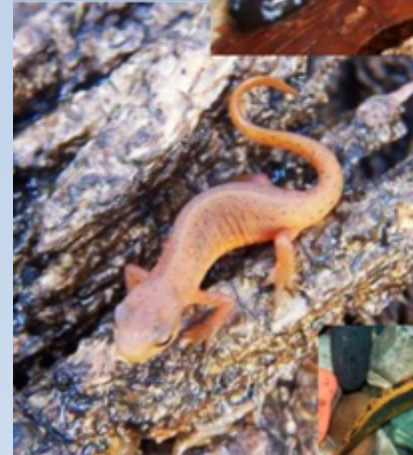
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# Salamander Species & Status

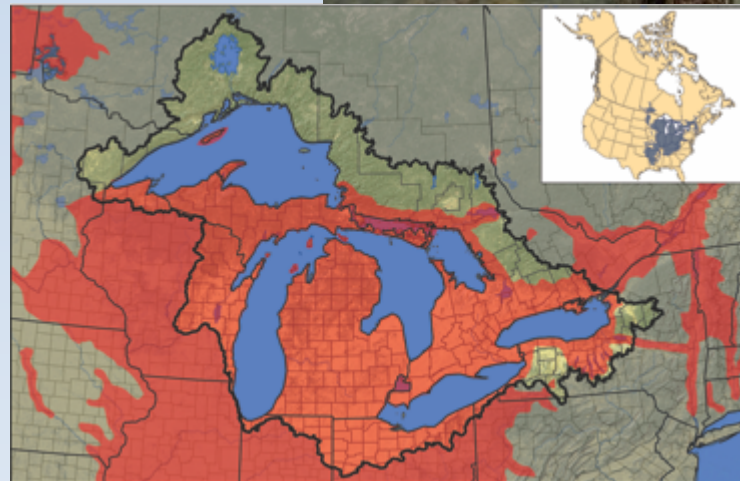
Salamanders Species	State Rank	Wildlife Action Plan
Western Lesser Siren	SC	SGCN
Mudpuppy	SC	SGCN
Blue-spotted Salamander		SGCN
Unisexual Ambystoma	N/R	SGCN
Spotted Salamander		SGCN
Marbled Salamander	T	SGCN
Small-mouthed Salamander	E	SGCN
Eastern Tiger Salamander		SGCN
Red-spotted Newt		
Central Newt		
Four-toed Salamander		SGCN
Red-backed Salamander		
Dusky Salamander	N/R	SGCN
Two-lined Salamander	N/R	SGCN





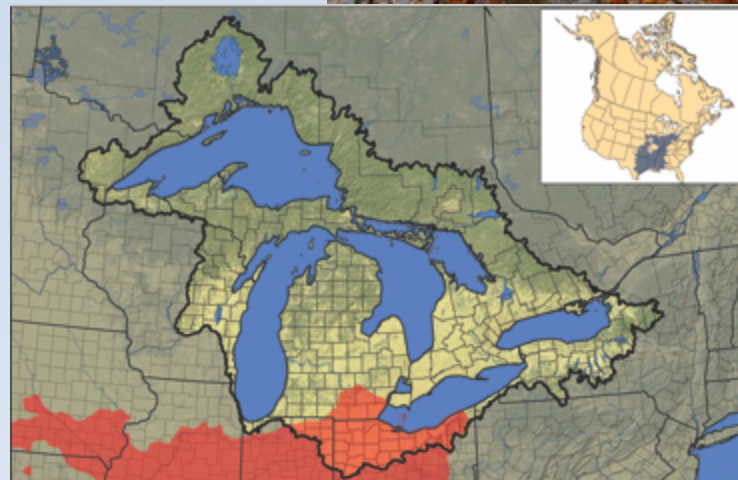
# Mudpuppy

- Michigan's largest salamander and the only fully aquatic species.
- Can live over 30 years and don't reach sexual maturity until 7-10 years.
- Obligate hosts to State Endangered (and Federal candidate) Salamander Mussels.
- Declines and die-offs known to be caused by application of lampricide chemicals, habitat degradation and loss, and direct persecution.



# Small-mouthed Salamander

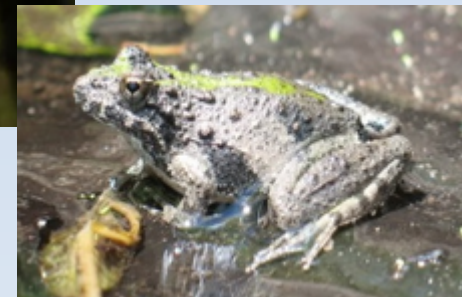
- Most abundant in lowland floodplain forests but also occur in open habitats.
- Known to hybridize with other *Ambystoma* species.
- While common in southern parts of the range, limited populations in Michigan call for preservation of woodlands with suitable breeding habitat.





# Frog and Toad Species & Status

Frog and Toad Species	State Rank	Wildlife Action Plan
Eastern American Toad		
Fowler's Toad	SC	SGCN
Green Frog		
Mink Frog		SGCN
Bullfrog		
Pickerel Frog	SC	SGCN
Leopard Frog		SGCN
Wood Frog		
Cope's Gray Treefrog		
Eastern Gray Treefrog		
Blanchard's Cricket Frog	T	SGCN
Northern Spring Peeper		
Western Chorus Frog		SGCN
Boreal Chorus Frog	SC	SGCN



# Fowler's Toad



- Inhabits open woodlands, sand prairies, meadows, beaches, and dunes. Closely associated with sandy soils.
- Threatened by degradation of critical beach and dune habitat by intensive recreational use, particularly off-road vehicles and availability of breeding sites. Agricultural chemicals have also been blamed for their decline.

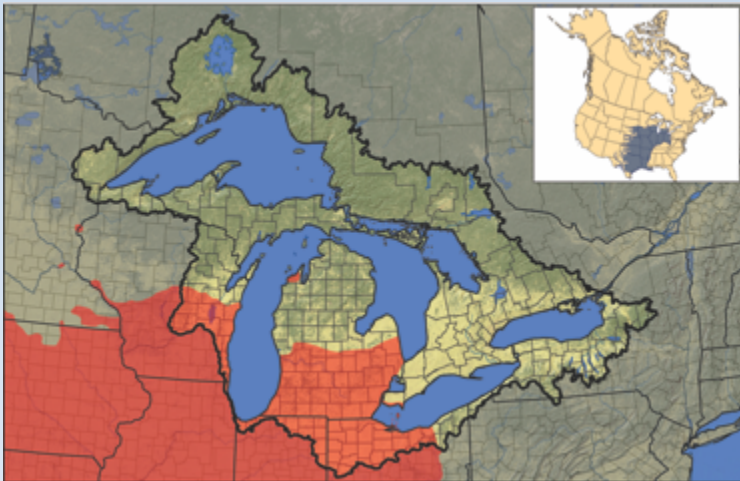




# Blanchard's Cricket Frog



- Usually found on edges of permanent bodies of water such as ponds, bogs, lakes, and slow moving streams.
- Declined drastically in the 1970's-1980's from northern parts of range.
- Populations declines thought to be caused by pesticides and other pollutants in aquatic habitats, climatic fluctuations, and landscape altering invasive species.



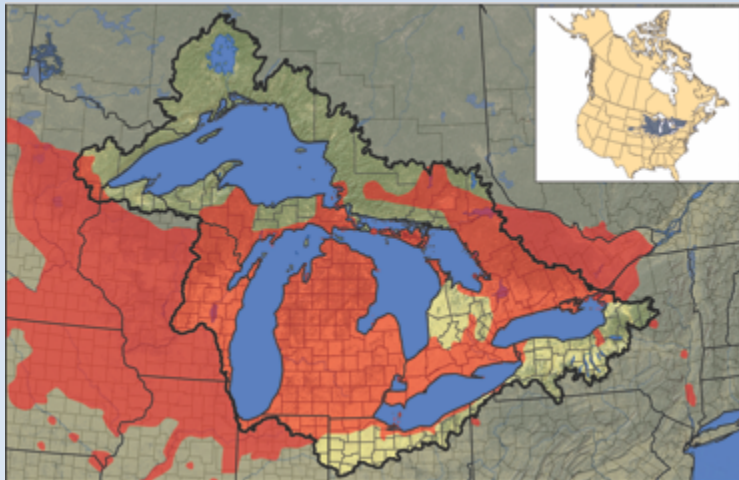
# Turtle Species & Status

Turtles Species	State Rank	Wildlife Action Plan
Eastern Snapping Turtle		
Eastern Musk Turtle		SGCN
Western Painted Turtle		
Midland Painted Turtle		
Blanding's Turtle*	SC	SGCN
Spotted Turtle	T	SGCN
Wood Turtle	T*	SGCN
Eastern Box Turtle	T*	SGCN
Red-eared Slider		
Northern Map Turtle		
Eastern Spiny Soft-shell		





# Blanding's Turtle

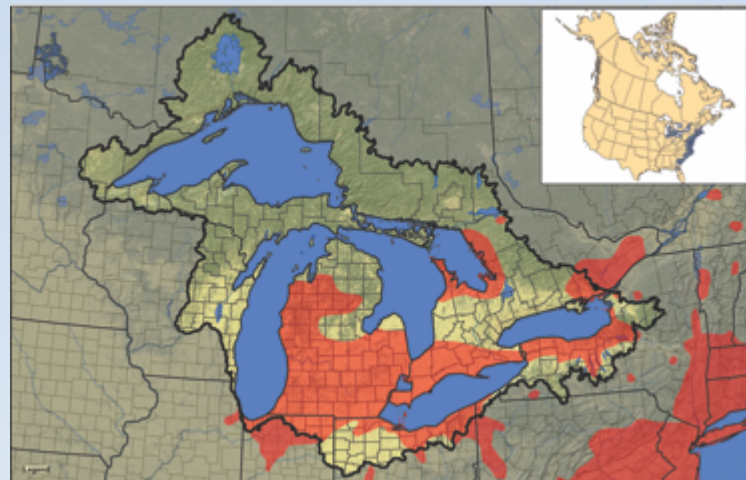


- Utilize a wide variety of habitats, often based on time of year.
- Michigan likely supports some the highest populations in the species range.
- Known to live 80+ years.
- Habitat fragmentation, road mortality, and subsidized predation act as a major drain on Blanding's.



# Spotted Turtle

- Found in wetlands with clear, shallow waters with a mud or muck bottom and ample aquatic and emergent vegetation.
- Large loss of preferred wetland habitats due to agricultural conversion and urbanization.
- Illegal collection also large threat.





# Snake Species & Status

Snakes	State Rank	Wildlife Action Plan
Kirtland's Snake	E	SGCN
Queen Snake	SC	SGCN
Butler's Garter Snake	SC	SGCN
Eastern Ribbon Snake		SGCN
Eastern Garter Snake		
Copper-bellied Water Snake	E	SGCN
Northern Water Snake		
Northern Brown Snake		
Northern Red-bellied Snake		
Northern Ring-necked Snake		SGCN

Snakes	State Rank	Wildlife Action Plan
Eastern Smooth Green Snake	SC	SGCN
Eastern Milk Snake		
Blue Racer		SGCN
Black Rat Snake	SC	SGCN
Western Fox Snake		SGCN
Eastern Fox Snake	T	SGCN
Eastern Hog-nosed Snake		SGCN
Eastern Massasauga Rattlesnake	SC/T	SGCN



# Butler's Garter Snake



- Similar in appearance to Eastern Garters and can be distinguished by the unique head shape and 3 distinct yellow/orange stripes.
- Prefer wet meadows and prairies, marshy pond and lake edges and other moist habitats.
- Earthworms make up a large part of diet.
- Primary threat to populations is loss of habitat





# Eastern Fox Snake

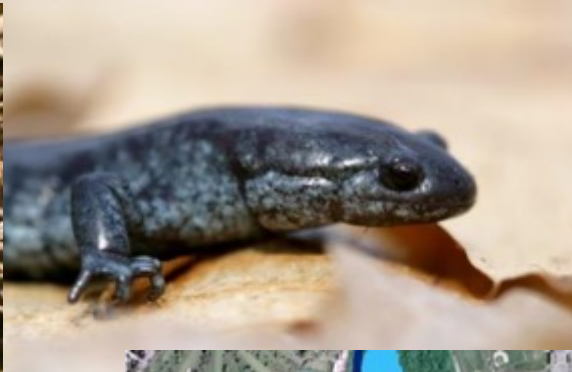


- Range lies entirely within the Great Lakes basin, primarily occupying shoreline marshes, vegetated dunes, and beaches.
- While not truly aquatic, they are strong swimmers and will travel long distances over water.
- Fate of this snake tied to health of coastal marsh systems.



# Conservation: Where the Herps?

We are only as accurate as our data is current. We can only protect what we know occurs. We only know what occurs, if we take the time to look and document. Many sites get missed in database reviews not because species are not there, but data was not recorded or not entered.



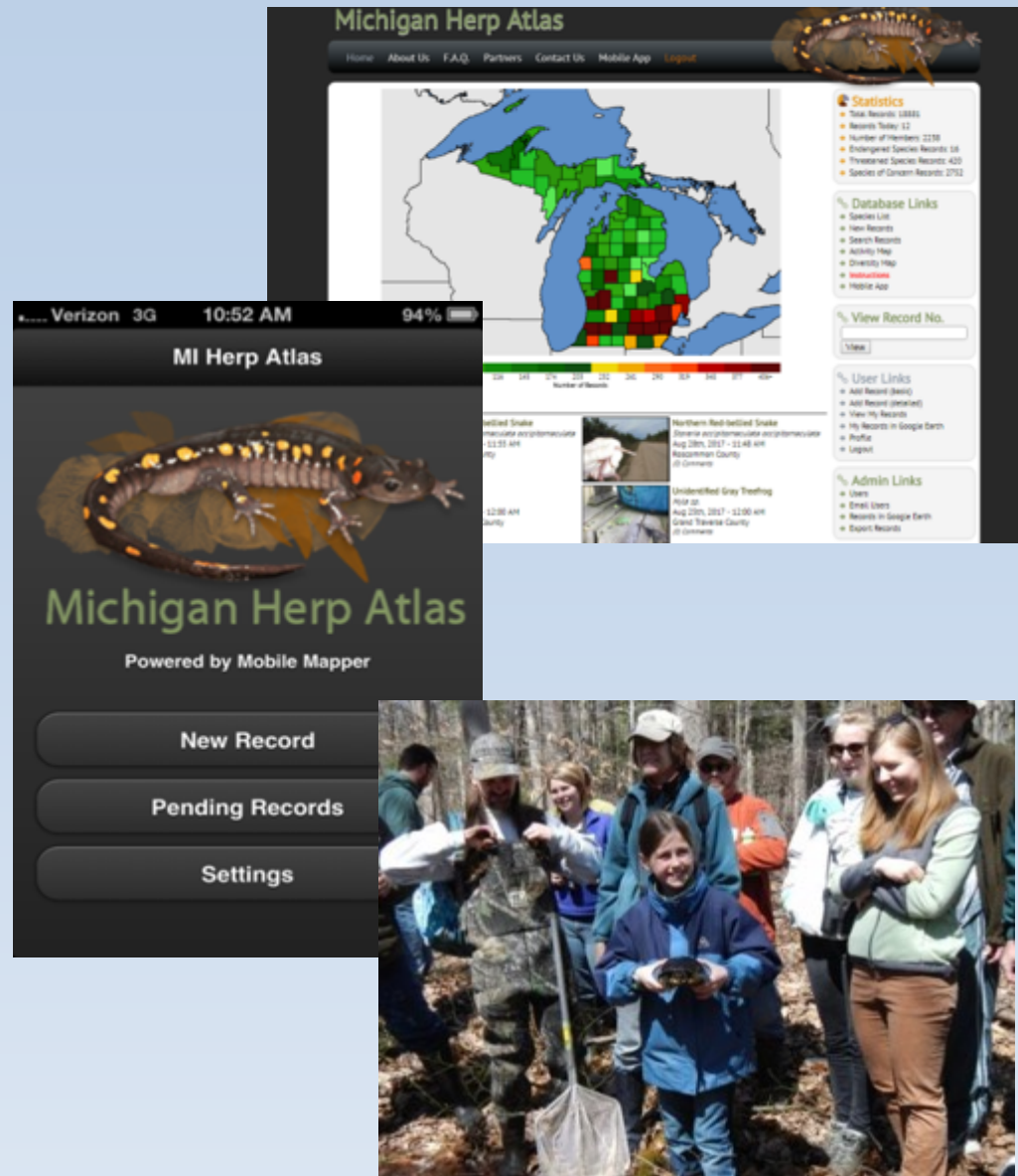


# Herpetofauna focused Databases: An Under Utilized Tool for Wetland Conservation



# The Michigan Herp Atlas

- Online database and smartphone app.
- Over 1,000 contributing members.
- Over 250,000 records gathered between various sources.
- Most comprehensive herpetofauna database in the state.





# Background

- Started by MDNR in 2004 to address a lack of data for Michigan.
- Public-Private partnership to optimize project partnership and data protection.
- Document distribution and changes in populations statewide.



# Goals

- Improved species protection and enforcement.
- Improved collaboration and data sharing.
- Greater understanding of species habitat use and needs.
- Contributions by everyone to build on species data for MI herps and resolve data gaps statewide on amphibian and reptile species, distribution, viability, and stressors.





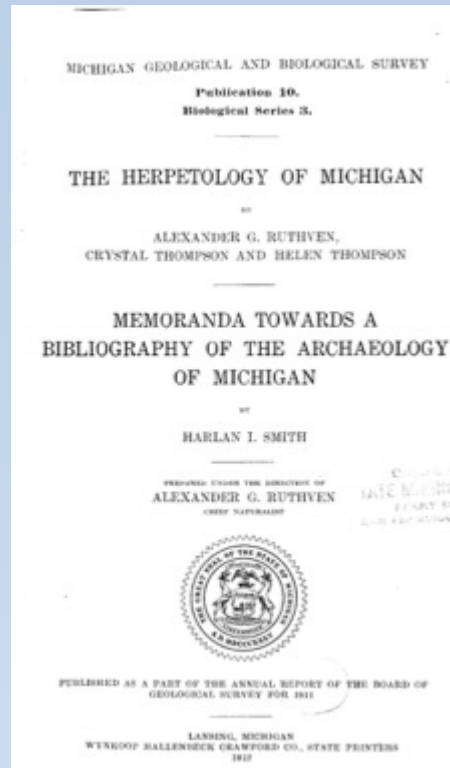
# Additional Herp Data Sources

## Databases

- Herp Mapper
- i-Naturalist
- Natural heritage Database
- Museum collections

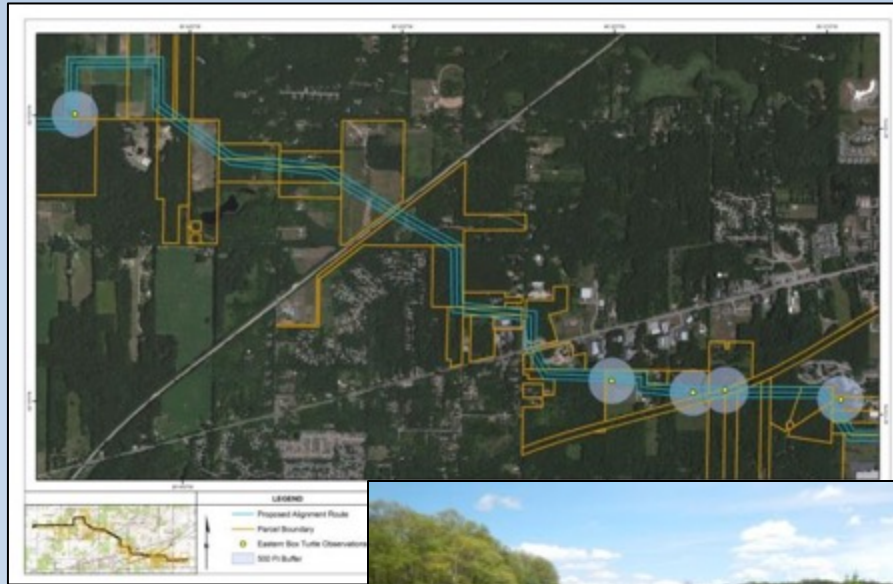
## “Untapped” Data

- Field notes
- Technical reports
- Archived and recent research
- Recorded incidental observations and bycatch



# Opportunities for Use

- Data is key to any effective conservation effort or management plan.
- Integrating data into analyses can:
  - Provide innovative tools for assessing wetland condition and health.
  - Determine important ecological hotspots and potential corridors.
  - Identify locations of data gaps and population declines.
  - Help evaluate response of invasive species control.





# Opportunities for Use

- Integrating data into analyses can:
  - Implement impact minimization and avoidance.
  - Determining potential impacts to wetland systems.
  - Identify locations of vernal pools or other critical habitat.
  - Evaluate potential wetland mitigation or restoration sites.



# Case Study

- Information from databases can be used as an important metric to guide restoration and evaluate outcome of major restoration projects.
- Flowing Wells Dam Removal: Kalkaska, MI
  - Historical herp data from various sources was used to help guide initial inventory work and restoration activities. Project is a model of effective novel community and species driven restoration.
  - Comparison between pre- and post-restoration wildlife monitoring demonstrated a shift from wetland to riparian communities.







HERPETOLOGICAL RESOURCE & MANAGEMENT



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