Massasauga Research in Ohio

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Ohio Biodiversity Conservation Partnership

The Ohio State University

MAFWA Director's Mtg.
Maumee Bay State Park
2019-06-25

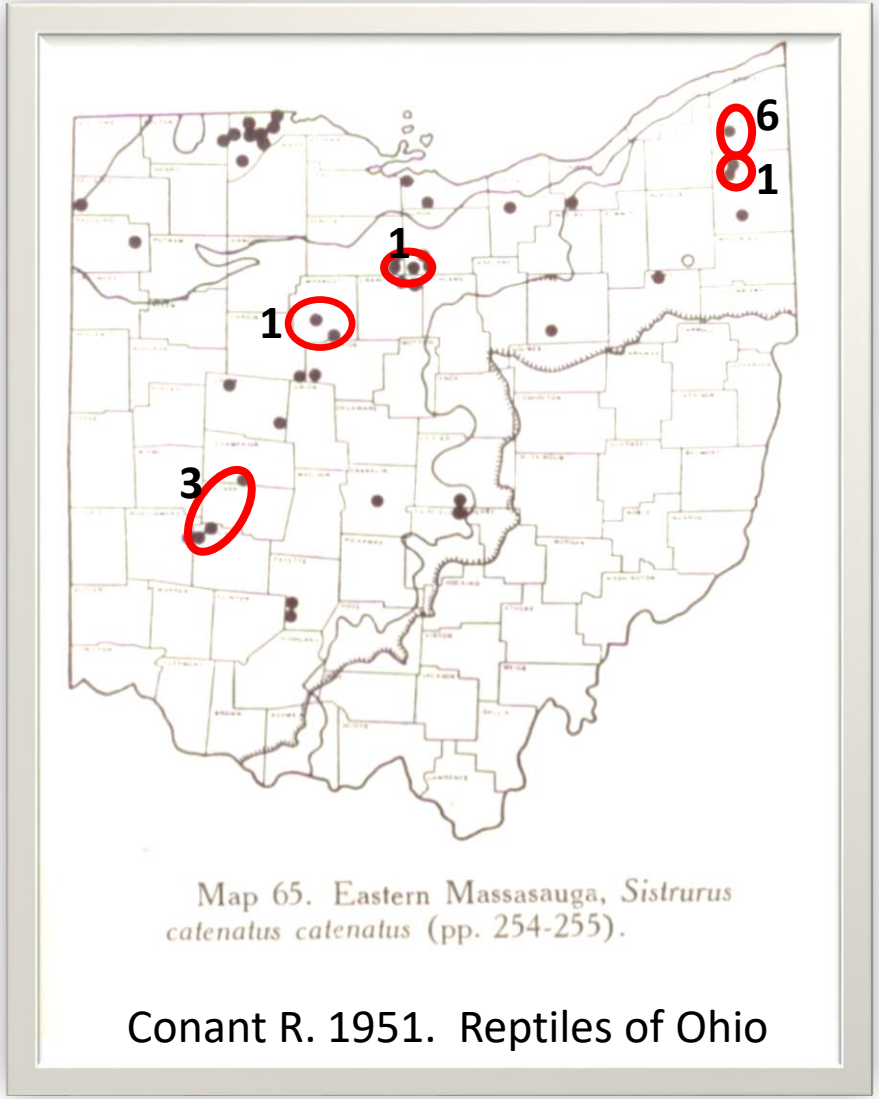
The Eastern Massasauga

- Family Viperidae, Subfamily Crotalinae: the “Pit Vipers”
  - Temperature sensitive facial pits
- Up to 30.5”
- Stocky
- Blotched

- MW distribution
- “Early successional” disturbance-dependent
- Overwinter in burrows, submerged
- 3-yrs. sexual maturity

E. Massasauga in Ohio

- Previously throughout glaciated OH.
- Today limited to 5 areas, 12 sites.
- All sites monitored, C-M-R.



Map 65. Eastern Massasauga, *Sistrurus catenatus catenatus* (pp. 254-255).

Conant R. 1951. Reptiles of Ohio

Massasauga Research in Ohio

- Doug Wynn: 30 years of monitoring at Killdeer Plains Wildlife Area
- Jeff Davis: Survey/monitoring of small, isolated pops in SW OH
- Greg Lipps: Northern Ohio surveys, monitoring. Habitat assessments.
- Lisle Gibbs lab (OSU): Genetics
  - Connectivity among local populations estimated using genetic data – Grand River Lowlands and Killdeer Plains in OH
  - Do small populations suffer a genetic cost using genome scale data? – Ohio and range-wide (US and Canada)
  - Genetic basis of adaptive differences between populations (Ohio and range-wide)

Habitat & Homerange

Lipps GJ and Smeenk NA. 2017. Ohio Conservation Plan: Massasauga, *Sistrurus catenatus*.

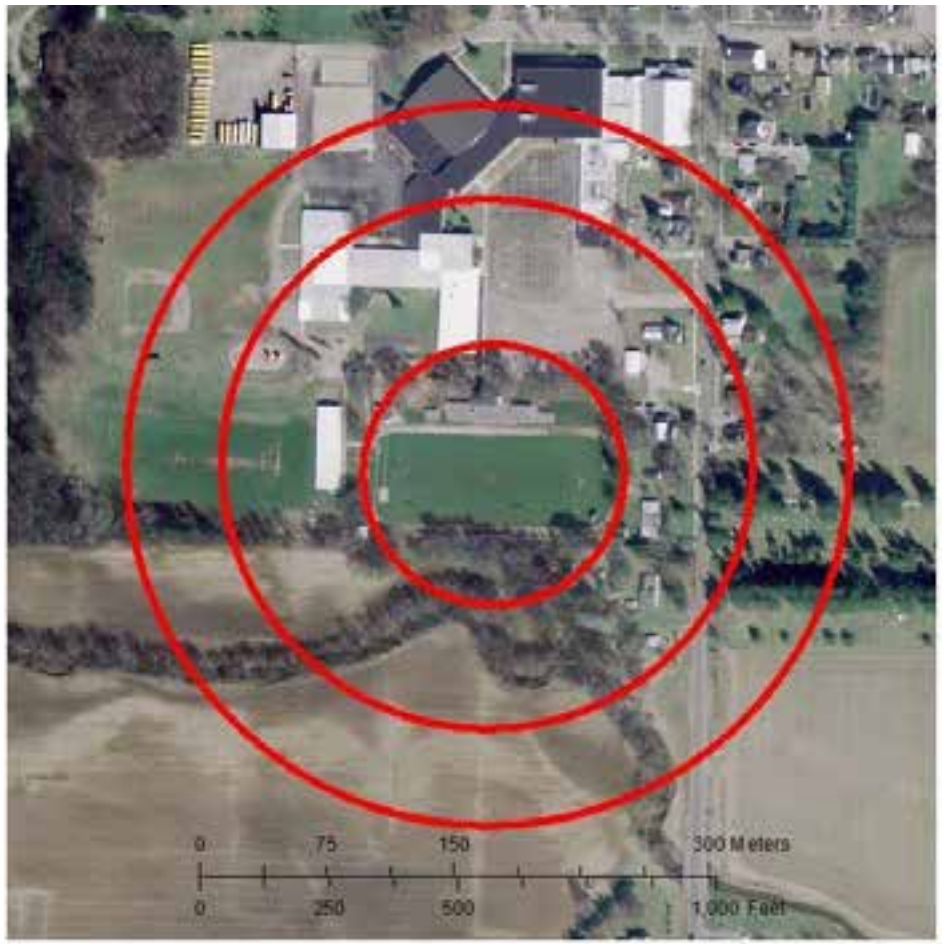
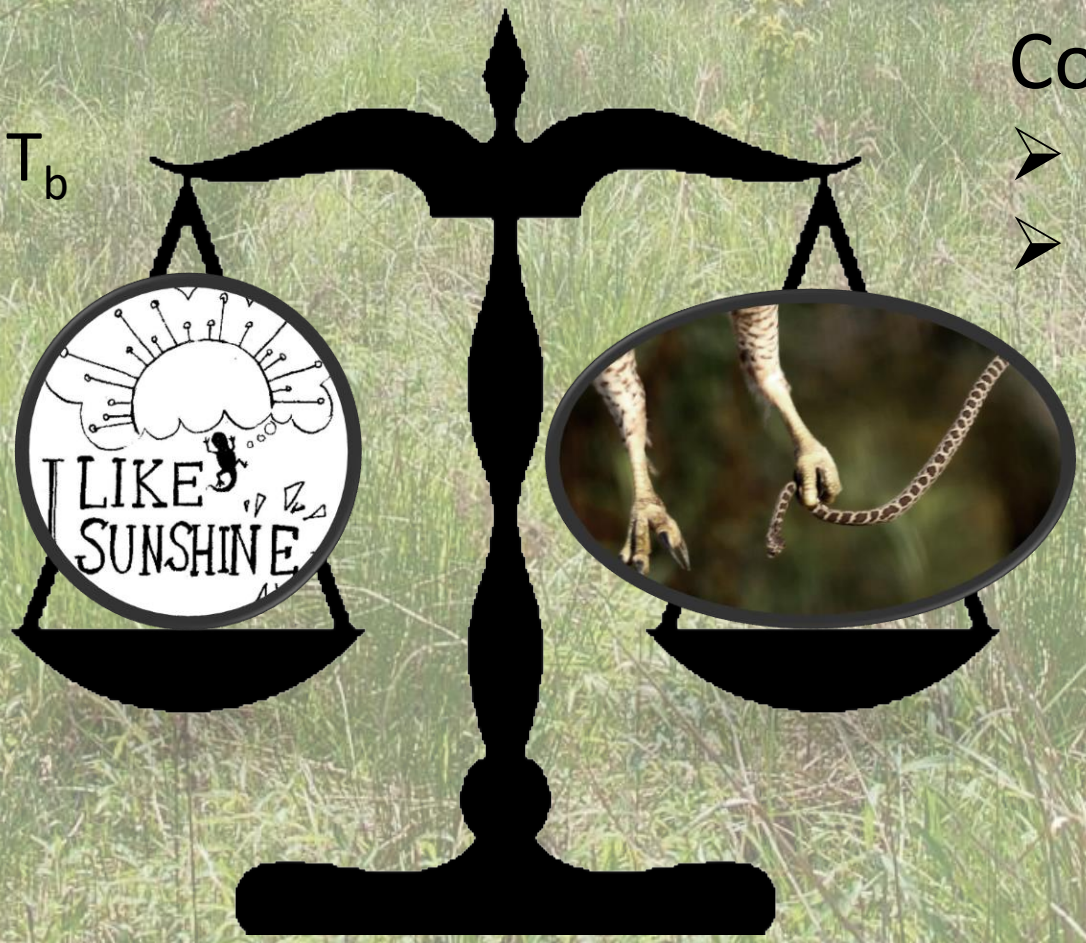


Figure 7. Homerange. Concentric rings around a football field (for scale) illustrate the mean home range sizes reported for Massasaugas (from smallest to largest): 1.86 ha (gravid females); 7.69 ha (non-gravid females); and, 14.26 ha (males).

What is the ideal habitat?

Open Herbaceous

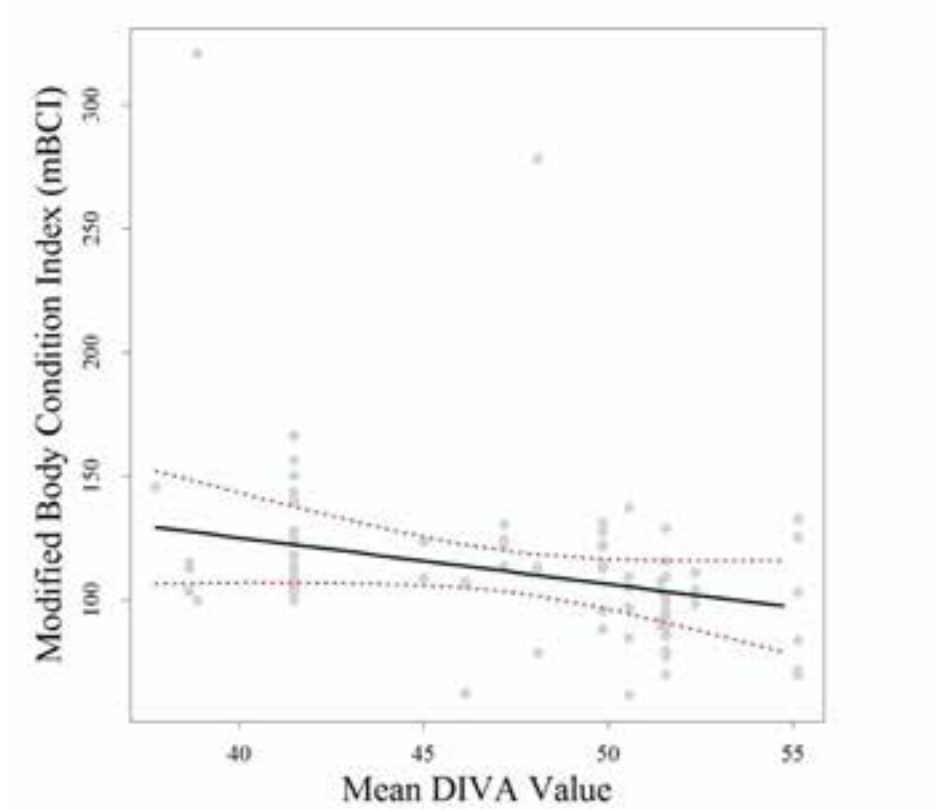
- Maintain optimum T_b
- Maximize prey

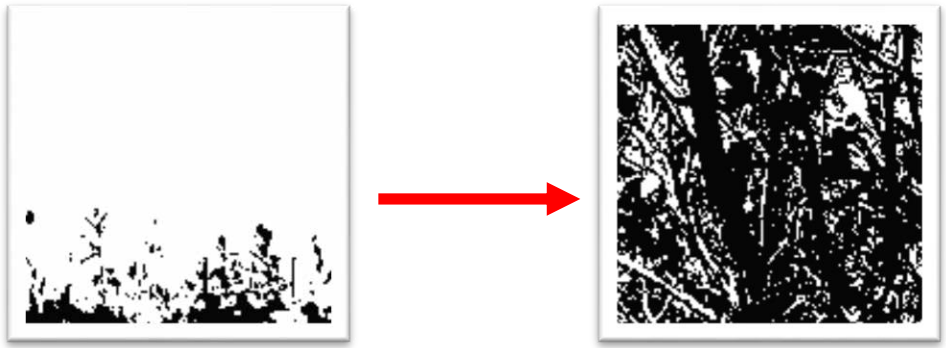


Cover & Refuge

- Predator avoidance
- Overwinter survival

DIVA: Digital Image Vegetation Analysis

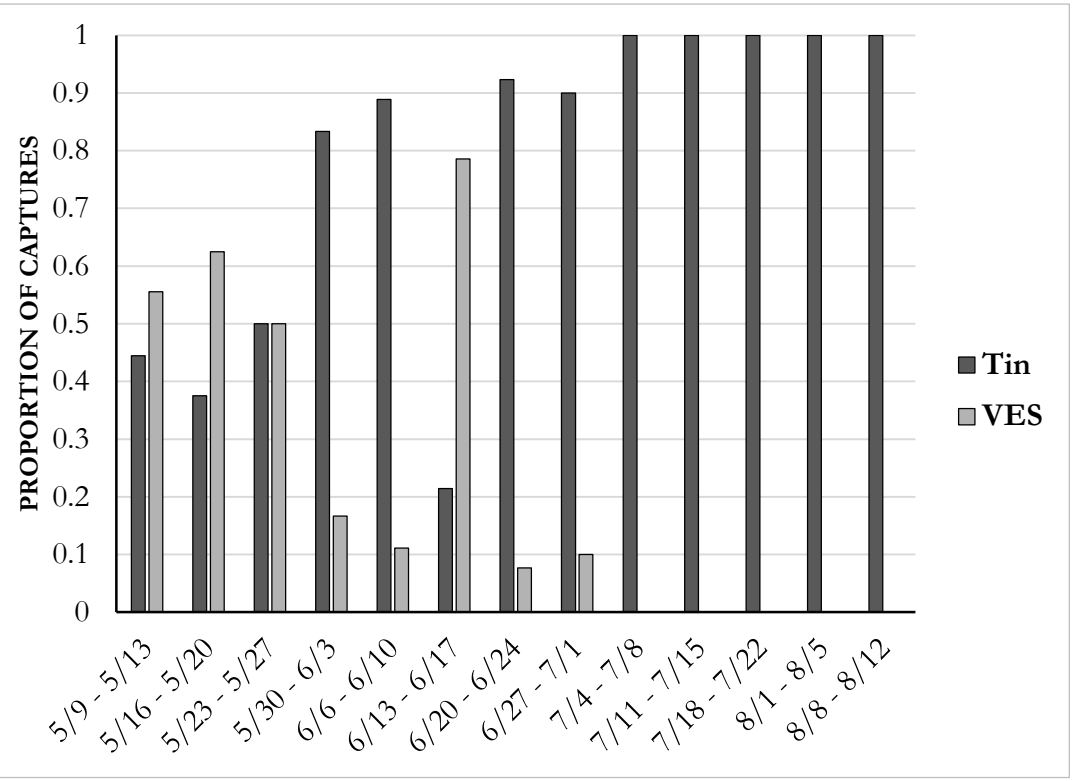




Methods

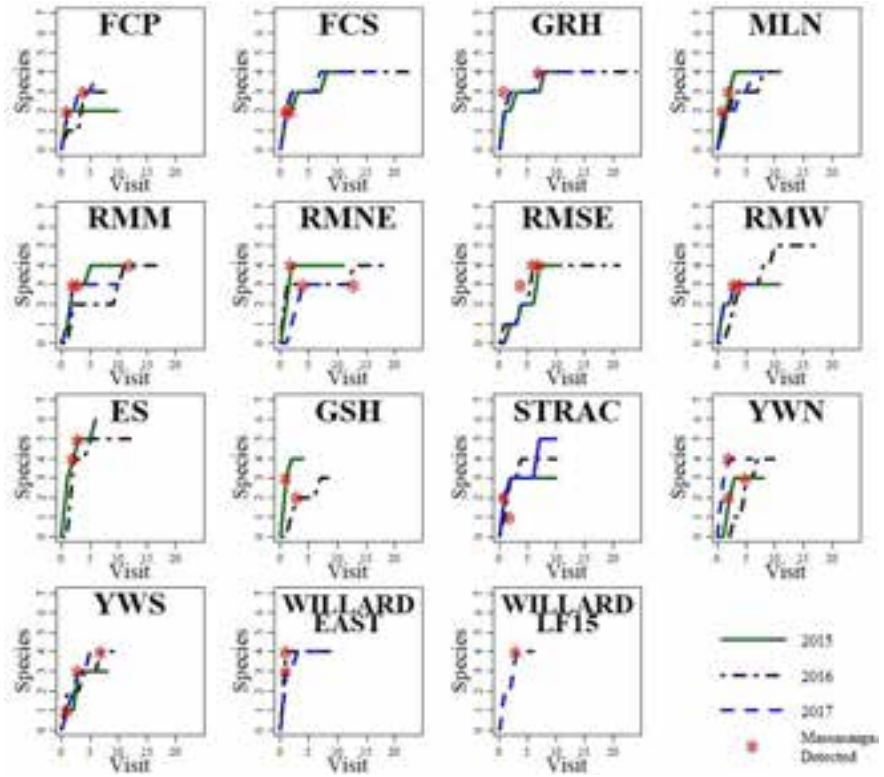
Tin works!

Season-long, but best in summer

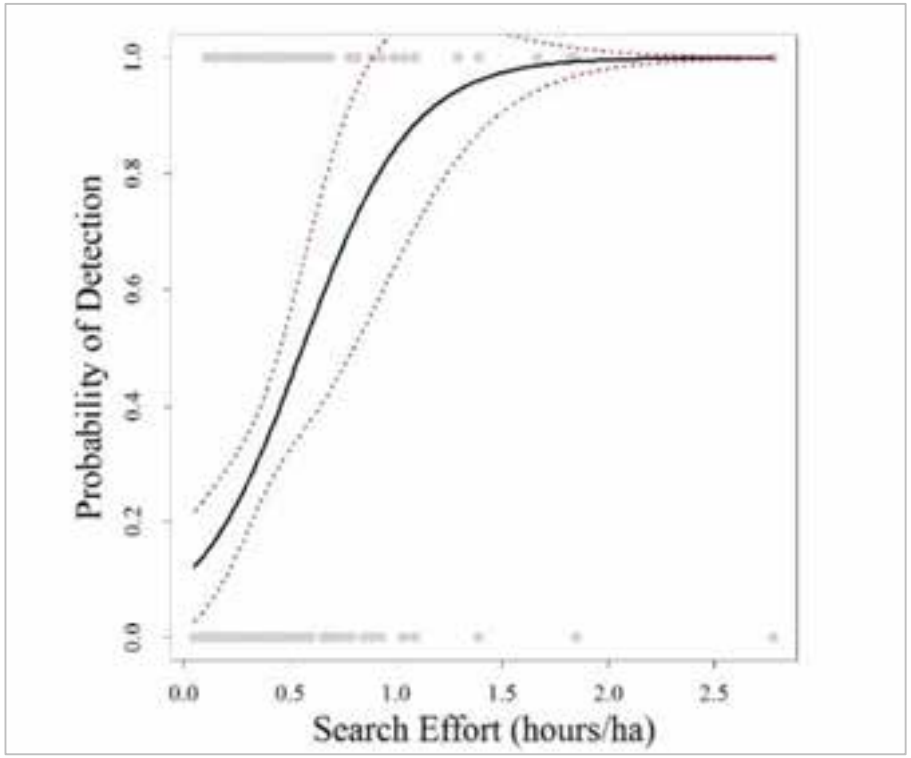


Detecting Massasaugas

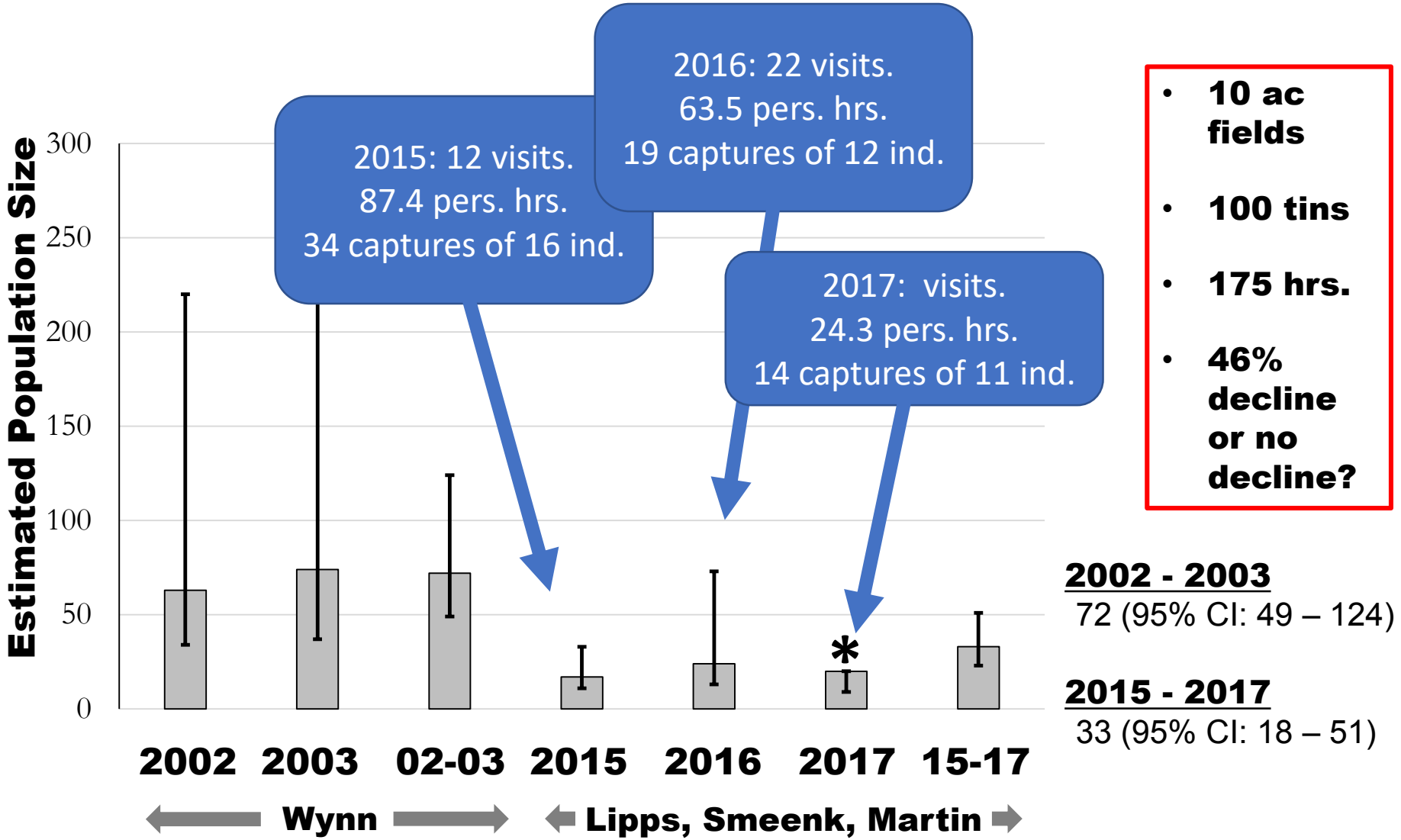
Generally detected c. 3 visits



Detection P >0.9 with 1.5 person-hrs. + tin



Rome State Nature Preserve



- **10 ac fields**
- **100 tins**
- **175 hrs.**
- **46% decline or no decline?**

2002 - 2003
72 (95% CI: 49 – 124)

2015 - 2017
33 (95% CI: 18 – 51)

And Relative Abundance doesn't work either

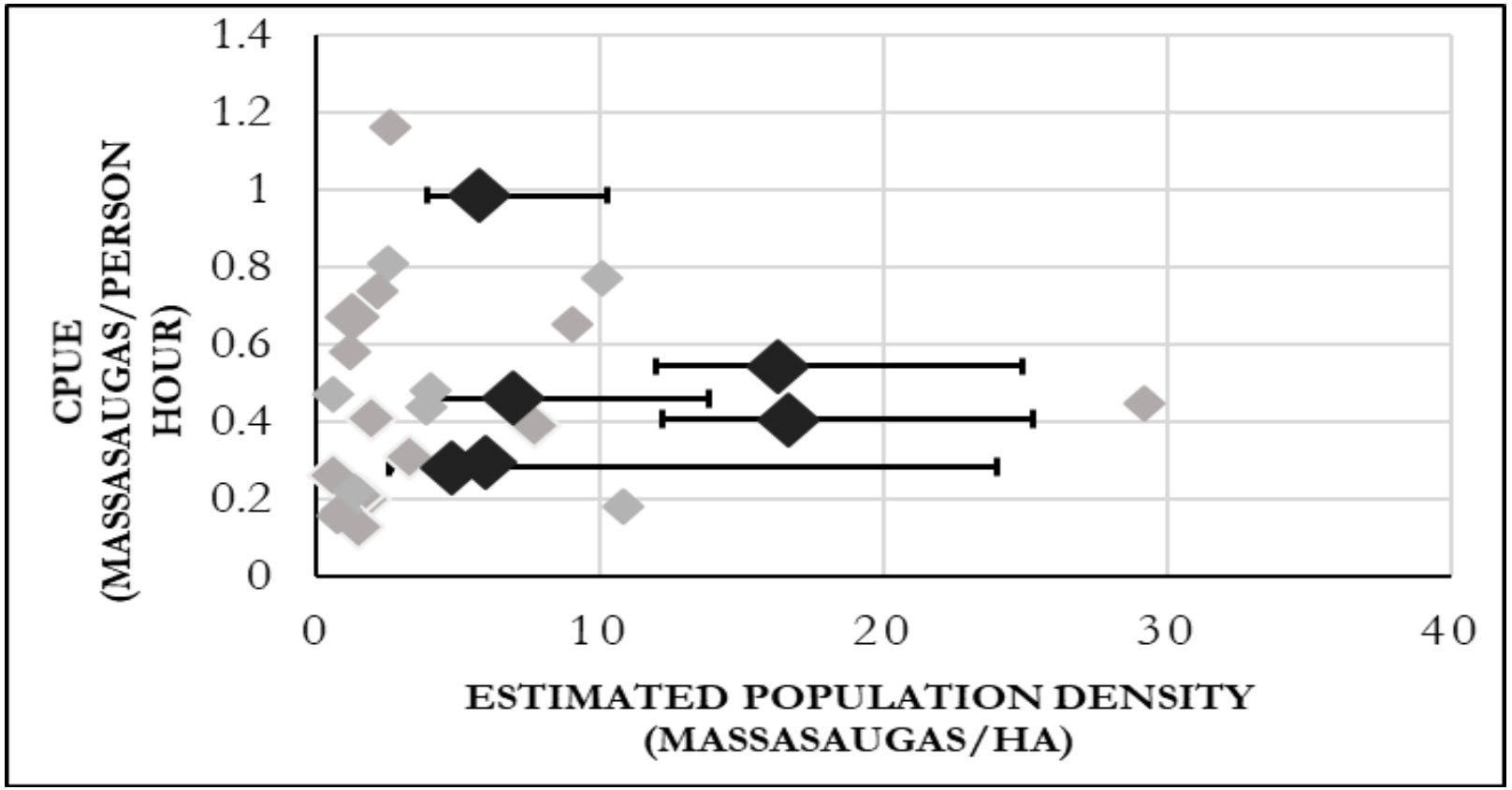
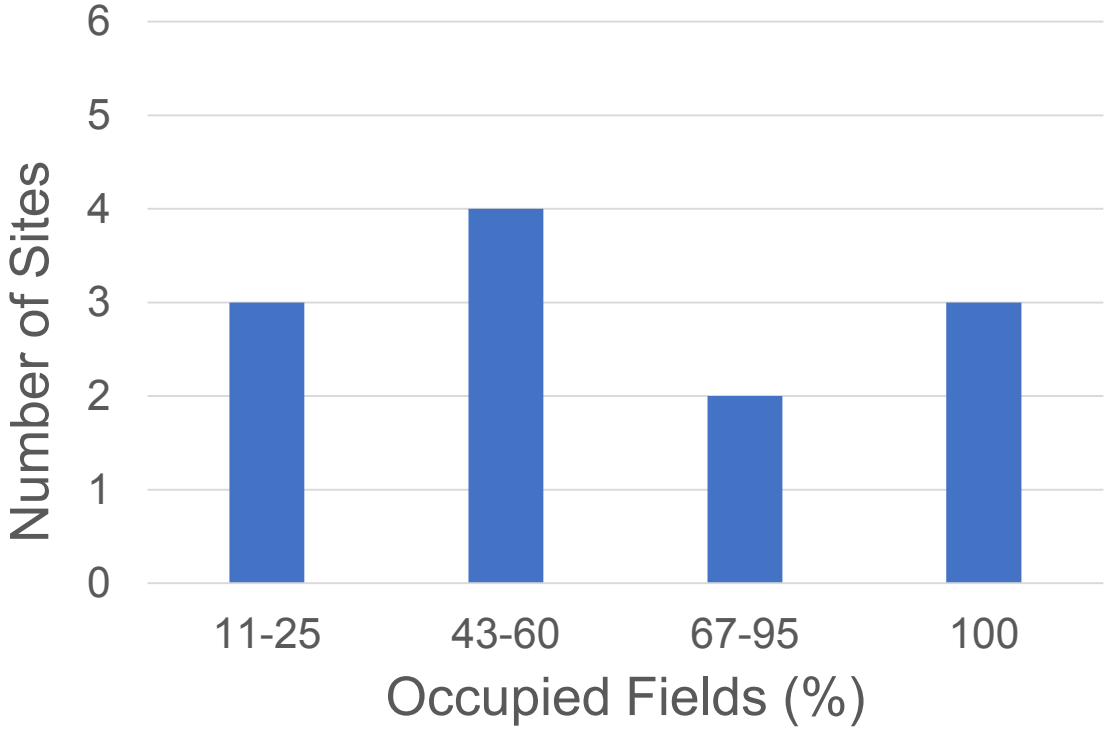
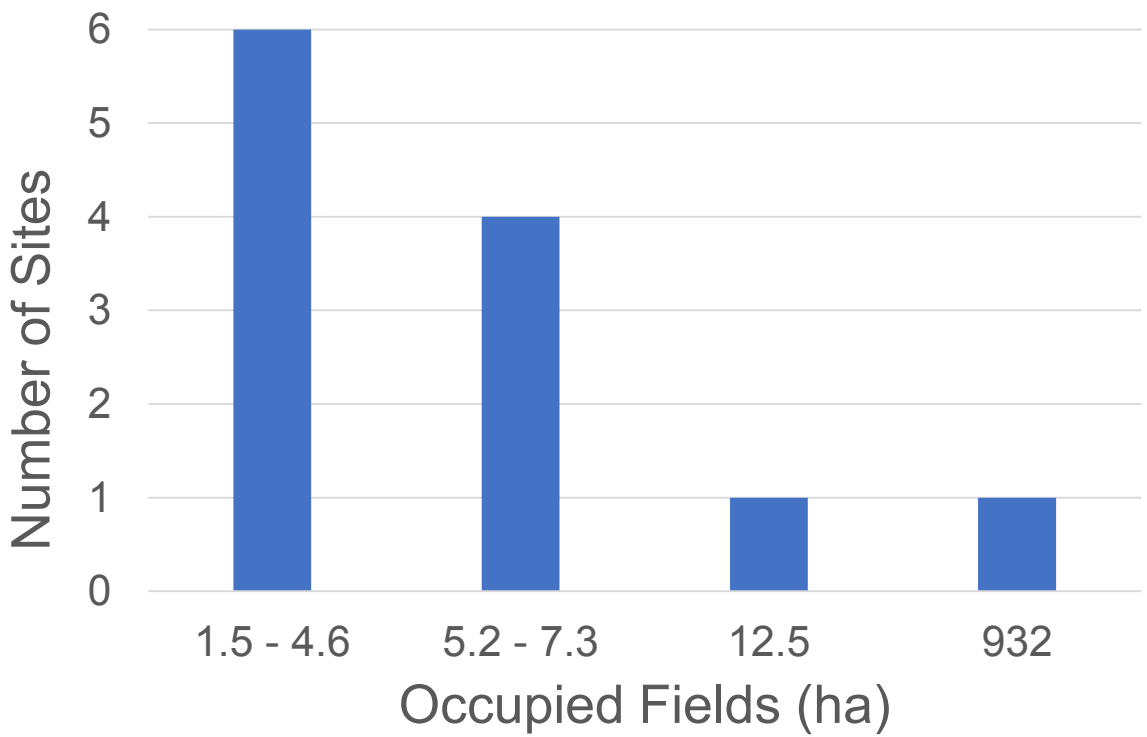


Figure 7. There is no relationship between the estimated population density (Massasaugas/ha) and catch per unit effort (Massasaugas/person hour). The lack of relationship suggests that relative abundance is a poor predictor of the actual number of snakes present. Grey diamonds represent CPUE from all sites (2015 – 2017) while black diamonds indicate mean by site with 95% CI.

What we know:

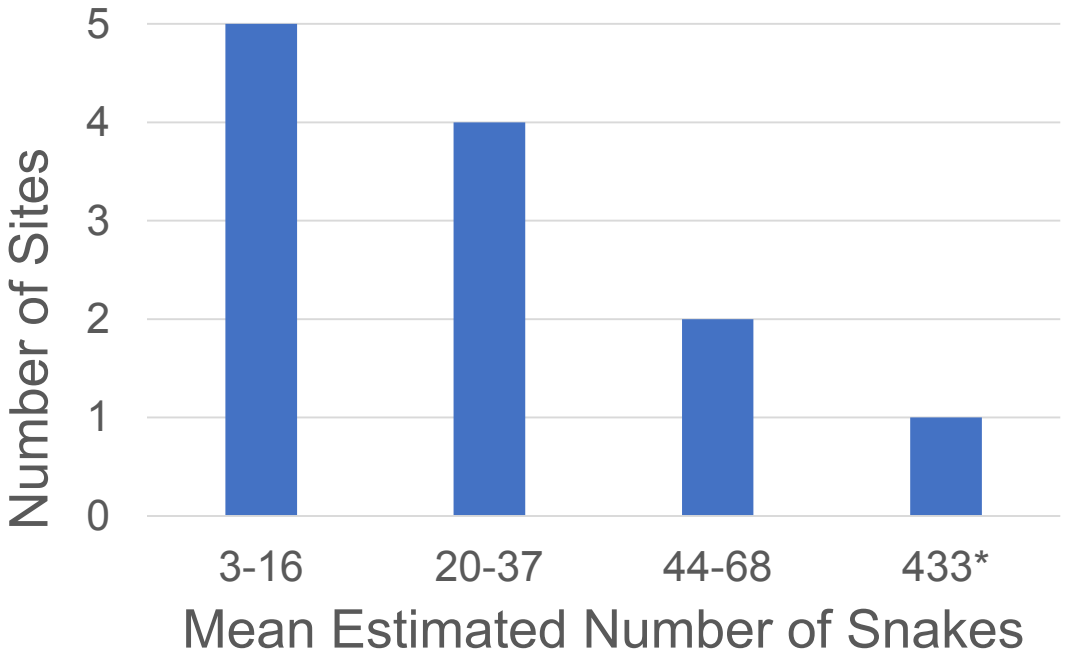
- 110 occupied fields totaling 1,130 ha
  - Mean occupied fields/site = 51%
  - 75% of sites have <28 ha of available habitat

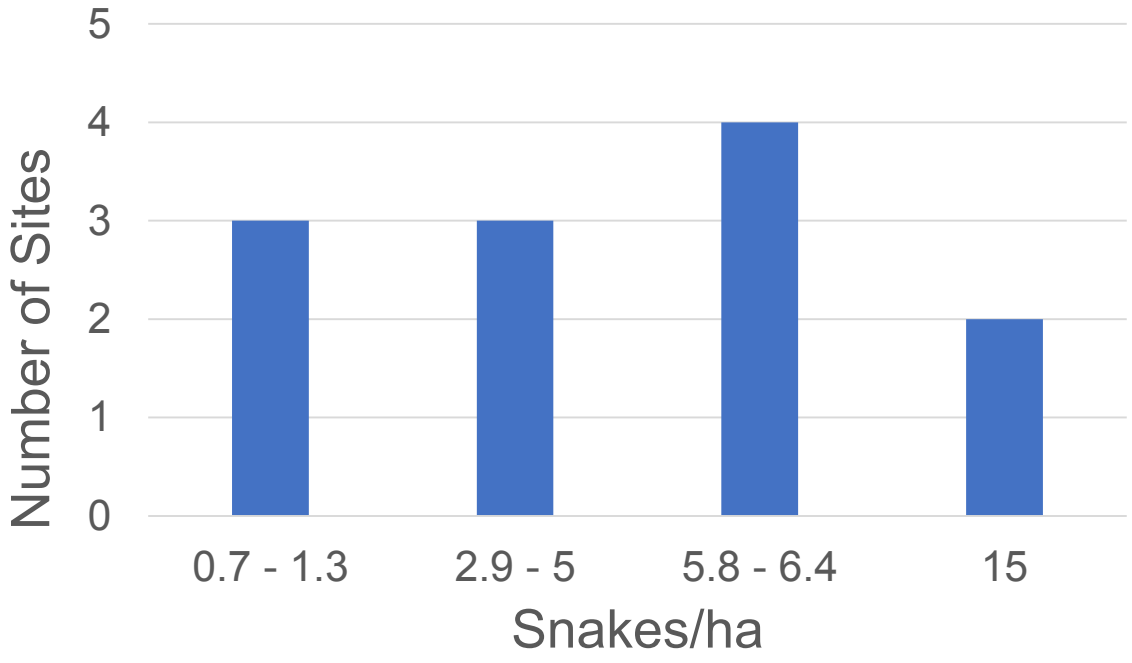




What we know:

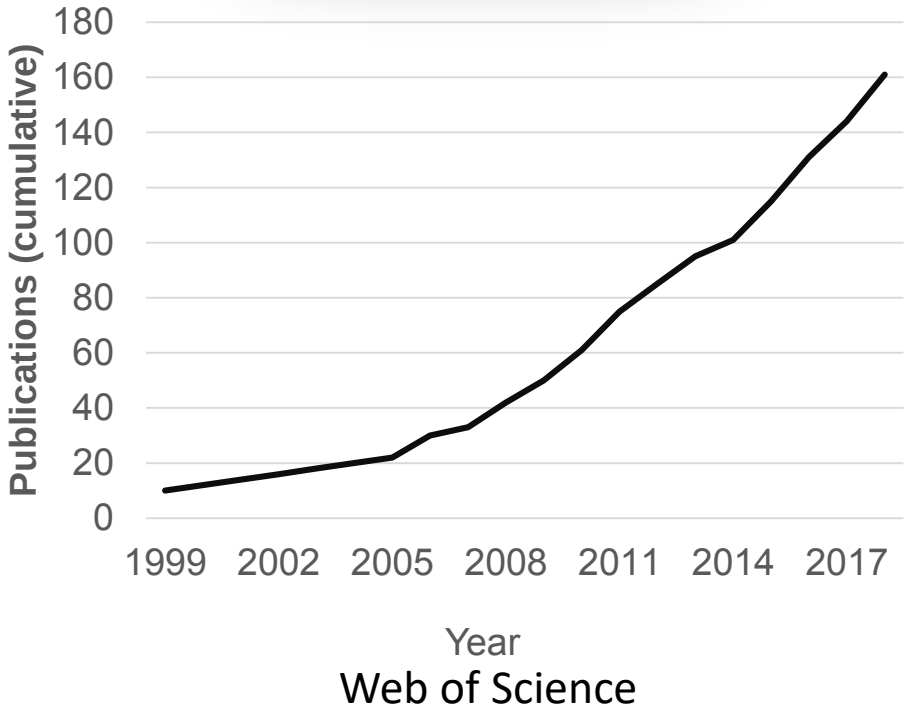
- Few snakes, but high density.
  - Mean “population” size = 59
  - Mean density = 5.75 snakes/ha





What we know:

- Snake will colonize adjacent areas.
- Large habitat patches + Low road density associated with largest pops.
- Woody succession + Invasive plants are greatest threats/challenges.
- We know a lot!
  - Life history = “recoverable” species.



What we don't know:

- *Ophidiomyces ophiodiicola* (Snake Fungal Disease)
  - Differences in *prevalence, resistance* and *susceptibility* (M. Allender, pers. comm.).
  - Conservation, Management implications are unclear.

Watersnake, *Nerodia sipedon*

E. Massasauga, *Sistrurus catenatus*

Acknowledgements

This project is supported by the State Wildlife Grants Program, administered jointly by the U.S. Fish and Wildlife Service and the Ohio Division of Wildlife with funds provided by the Ohio Biodiversity Conservation Partnership between Ohio State University and the Ohio Division of Wildlife.

Special thanks to: Jeff Davis, Doug Wynn, and Scott Martin for data; Kate Parsons, Lisle Gibbs, Brett Rodstrom, and Adam Wohlever.

Color and pattern diversity of Eastern Massasaugas in Ohio.

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