Massasauga Research in Ohio

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MAFWA Director’s Mtg.
Maumee Bay State Park
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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.

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
- 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

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

2002 - 2003
72 (95% CI: 49 – 124)

2015 - 2017
33 (95% CI: 18 – 51)

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

Estimated Population Size

2015: 12 visits.
87.4 pers. hrs.
34 captures of 16 ind.

2016: 22 visits.
63.5 pers. hrs.
19 captures of 12 ind.

2017: visits.
24.3 pers. hrs.
14 captures of 11 ind.

Wynn, Lipps, Smeenk, Martin
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*
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Color and pattern diversity of Eastern Massasaugas in Ohio.

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