Using Targeted Poisoning of Red Imported Fire Ants to Improve Texas Horned Lizard Habitat

Kira N. Gangbin[1], Rachel Alenius[1], Madison Upton[3], Diane Barber[3], Nathan Rains[2], Mark Mitchell[2], and Dean A. Williams[1]

Department of Biology, Texas Christian University[1]; Texas Parks and Wildlife[2]; Fort Worth Zoo[3]

BACKGROUND

- Texas horned lizards are hypothesized to be declining due to the introduction of the red-imported fire ant (RIFA) [1]
- RIFA directly predate hatchling horned lizards and outcompete native ants
- Native small ants are the primary component of a hatchling horned lizard's diet
- Broadcast bait historically effective at reducing RIFA populations, but also known to reduce native ant species[2]

Different ant and termite species that are important components of a hatchling diet (small ants and termite) and adult diet (large harvester ant)

Objective

- Assess whether implementation of a targeted ant poisoning: 1) Reduces RIFA populations, and 2) Causes no significant reduction in ant species important for a hatchling's diet

STUDY DESIGN

- Study Site: Mason Mountain WMA is a state-owned property in Central Texas that has hosted reintroduced Texas horned lizards since 2015
- Four plots: 2 Untreated & 2 Treated in 2022, 1 Untreated & 3 Treated in 2023
- Baiting repeated once a month (May – Aug both years)
- Pitfall traps repeated once per month (May – Oct in 2022; Jun – Sept in 2023)
- Pitfall trapping always conducted 2 weeks after baiting

Bait Stations

Place hot dog slice on upside-down deli cup, 5 m apart in 10x10 grid

↓ Wait 30 min for ant recruitment

Identify ants present. If at treatment site, apply 1 teaspoon of Amdro® (ant poison) if RIFA present

↓ Wait 30 min for ants to take bait

Using deli cup, pick up hot dog, poison, and ants

↓

Identify ants to genus or species

Pitfall Traps

Buried 10 mL test tube pitfall traps in 5x5 grid, spaced 5 m apart centered in baiting location

↓ Leave for 4 days

Collected pitfall traps

↓

Identified ants to genus or species

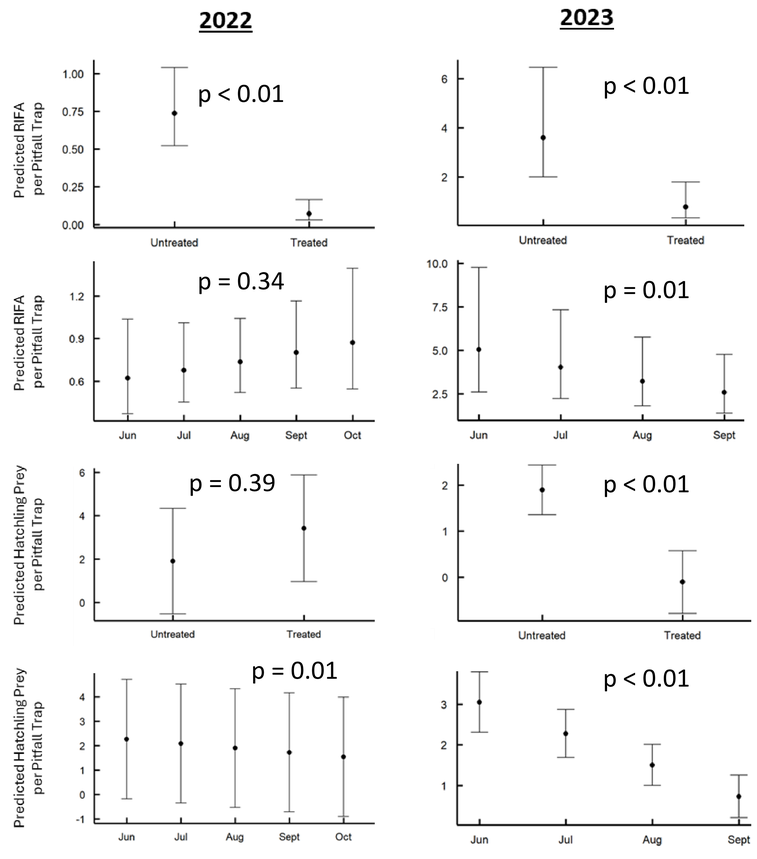
DATA ANALYSIS

- Constructed Generalized Linear Mixed Models (GLMMs) fit to different distributions

	2022	2023
Pitfall RIFA Abundance	Negative binomial 1	Zero-inflated generalized Poisson
Pitfall Hatchling Food Abundance	t-family	t-family
Bait Station, RIFA Abundance	Binomial	Zero-inflated binomial

RESULTS

Do pitfall traps show that targeted poison reduces RIFA and does not affect ant species important to a hatchling's diet?



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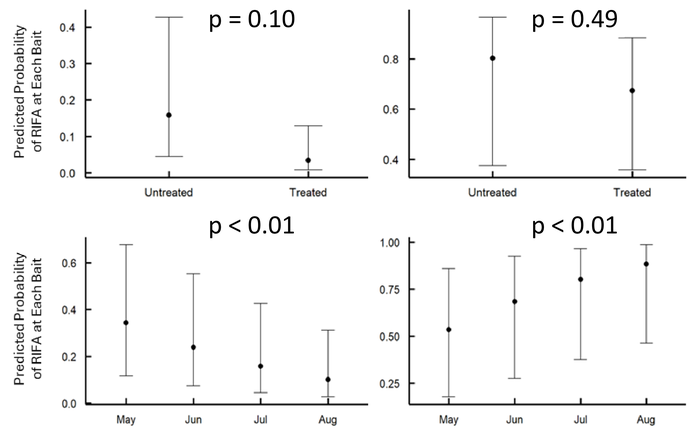

DISCUSSION

- Treatment may have caused a decrease in RIFA both years
- Hatchling food abundance was not affected by treatment in 2022, but was significantly reduced in 2023
- Seasonality often decreases ant activity, except in bait stations for 2023
- High variability suggests we need a larger sample size to better detect potential treatment effect

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[1] Donaldson W., A.H Price, & J. Morse. 1994. The current status and future prospects of the Texas horned lizard (*Phrynosoma cornutum)* in Texas. *Texas Journal of Science* 46(2): 97-113. **[2]** McNaught M.K. et al. 2014. Effect of broadcast baiting on abundance patterns of red imported fire ants (Hymenoptera: Formicidae) and key local ant genera at long-term monitoring sites in Brisbane, Australia *Journal of Economic Entomology* 107(4): 1307-1315