Differential diets, growth rates, and survival of captive-bred hatchling Texas horned lizards (*Phrynosoma cornutum*) reintroduced at two locations in central Texas.

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INTRODUCTION

- Texas horned lizards have declined throughout their native range.[1]
- Several zoos have begun captive breeding programs of Texas horned lizards for the purposes of reintroduction to the wild.
- Reintroduction attempts of captive-bred animals can have limited success.[2]
- Failure to select suitable habitat could influence the reintroduction success of hatchling horned lizards, whose habitat requirements are poorly understood.[3]
- The goal of this study was to assess whether diet, growth rates, and short-term survivorship of hatchling horned lizards differed between two reintroduction sites in central Texas.

METHODS

MONITORING

- 254 captive-bred lizards were randomly assigned to 2 release sites at Mason Mountain Wildlife Management Area (Mason County, Texas) (**Fig. 1**).
- Lizards were tagged and located 3-4 times a week from Sep. to Nov. 2020 using uniquely labeled harmonic radar diode tags (**Fig. 2**).[3]

DIET

- Scat were opportunistically collected and dissected to assess diet at each site (**Fig. 3**).

GROWTH

- Weight and snout-to-vent length (SVL) were measured 1x a week.

SURVIVORSHIP

- Lizards were classified as "dead" if the tag was found attached to a deceased lizard or was recovered in fecal material of a predator.
- Lizards that could not be located or confirmed dead were assigned unknown fates.
- We estimated upper and lower survivorship to brumation for each site using the R "survival" package, assuming all unknown fates were either alive or dead.

Figure 1. Release Sites

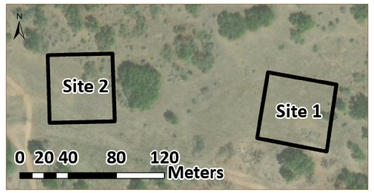
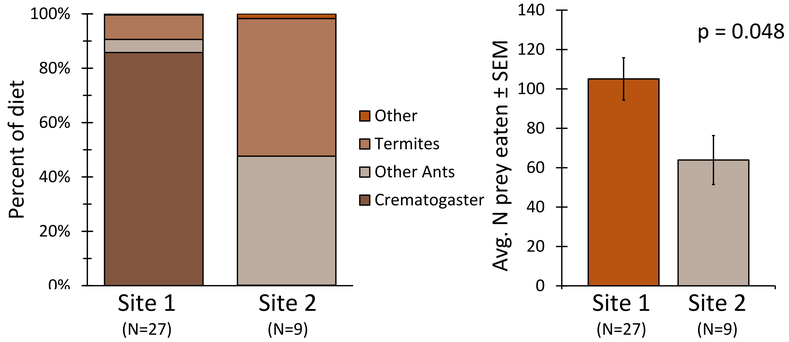


Figure 2. Hatchling horned lizard with harmonic radar diode tag

Figure 3. Horned lizard scat & exoskeleton fragments used to assess diet.

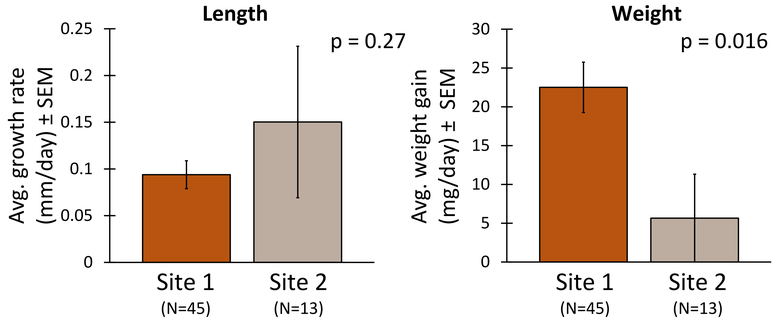
RESULTS

Figure 4. Diets of horned lizards at each release site.



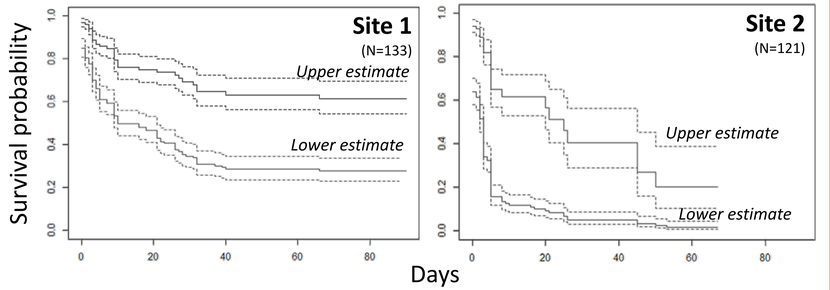
- Lizards at Site 1 ate primarily acrobat ants (*Crematogaster punctulata).*
- Diets of lizards at Site 2 were more diverse and contained few acrobat ants.
- On average, fecal samples at Site 1 contained more prey items than lizards at Site 2.

Figure 5. Average lizard growth rates at each site.



- There were no differences in the SVL growth rate, although Site 2 had higher variance (p<0.001)
- On average, lizards at Site 1 gained weight more quickly than lizards at Site 2.

Figure 6. Upper and lower survival estimates for each release site.



- Site 1 had higher survivorship to brumation than Site 2.
- Site 1 lower survival estimate is comparable with natural populations.[3]

DISCUSSION

Location may be an important factor in the short-term reintroduction success of hatchling Texas horned lizards

- Higher growth rates and survivorship at Site 1 suggest it is more suitable habitat.
- Ongoing studies suggest dietary differences between sites are consistent with differences in prey availability.
- Home ranges as small as 2m^2 may mean proximity of resources is as important as availability.
- Future studies will evaluate differences in other factors such as vegetation, thermal habitat, and soil hardness between locations.

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[1] Donaldson W, AH 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]** Griffith, B, JM Scott, JW Carpenter, & C Reed. 1989. Translocation as a species conservation tool: status and strategy. *Science* 245(4917): 477-480. **[3]** Vesy, MN, JL Watters, RW Moody, EM Schauber, JM Mook, & CD Siler. 2021. Survivorship and spatial patterns of an urban population of Texas horned lizards. *The Journal of Wildlife Management* 2021: 1-13. DOI: 10.1002/jwmg.22064.