Trail disturbance on reptiles in the Phoenix Mountain Regional Parks

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Introduction & Objectives

- Open space in parks can offer habitat and refuge for urban wildlife.
- Our research objectives were to investigate how reptile diversity and abundance, and vegetation cover vary in relationship to multi-use trail types at two county parks.

Methods

- Reptiles and vegetation surveyed at McDowell Mountain and Usery Mountain Parks (**Fig. 1**).

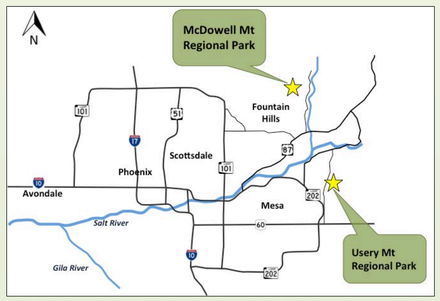


Figure 1: Map of mountain parks

- Reptiles surveyed via visual encounter within 10m x 20m transects during July and August 2013 (**Fig. 2**).
- We surveyed 20 high and 20 low use trails, paired with 40 off-trail transects 150 m away (**Fig. 2**).

Figure 2: On-trail surveys (left photo) and off-trail surveys (right photo).

- We measured 14 vegetation characteristics using point-intercept, line-intercept, cover classes, and direct counts.
- Abundance was defined as max number seen during surveys and evaluated using parametric and non-metric tests. Habitat variables were reduced using Principle Component Analysis (PCA). Species-habitat relations were explained using regression analyses.

Results – Reptile Abundance

- We encountered 235 reptile sightings of 10 species; common side-blotched lizards (*Uta stansburiana*) were the most abundant (**Fig. 3**).

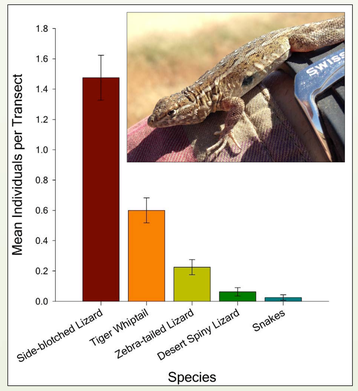


Figure 3: Mean reptile species richness.

- Parks had similar lizard abundance (P=0.233, T=1498.0; Mann-Whitney Rank Sum Test).
- Trails with high and low use had similar lizard abundance (t=0.776, P=0.443; Student t-test).
- There tended to be species-specific differences (**Fig. 5**).

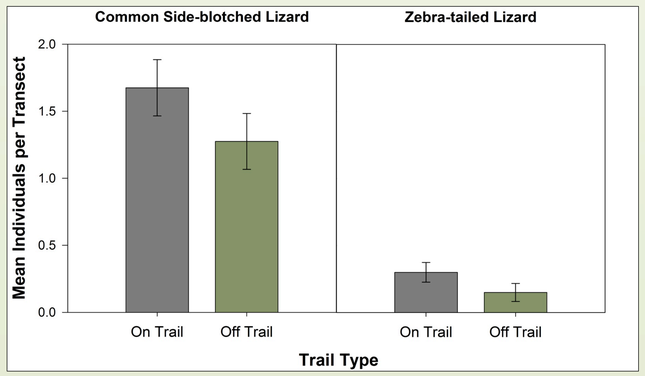
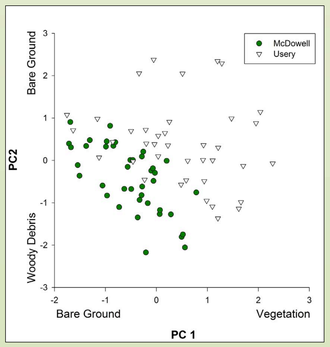


Figure 5: Mean (±SE) abundance of common side-blotched lizard (W=129.0, P=0.094) and zebra-tailed lizard (W=39.0, P=0.129).

Results - Habitat

- Habitat variables were reduced to 4 main factors explaining 63% of variation (PCA). Factors described vegetation and ground cover.

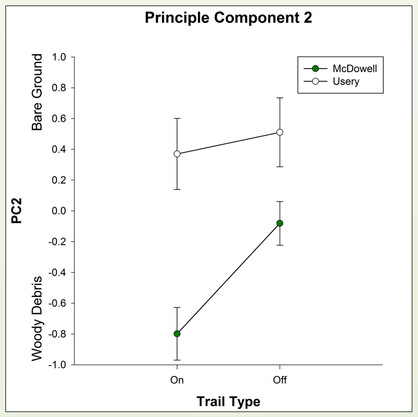


- McDowell Mtn Park had less vegetation (PC1) and more woody debris cover than Usery Mtn Park, which was characterized by veg/shrub cover (PC1) and woody debris, bare ground (PC2) (**Fig. 6**).

Figure 6: PC1 represents vegetation and shrub cover, and PC2 represents bare ground and openness.

Results – Species Habitat Relations

- Zebra-tailed lizard occurrence was negatively associated with PC2 (X^2=11.203 P=0.004, 80%), meaning that lizards were found more often in areas containing ground cover and woody debris (**Fig. 7**).
- Other species-habitat models were inconclusive.



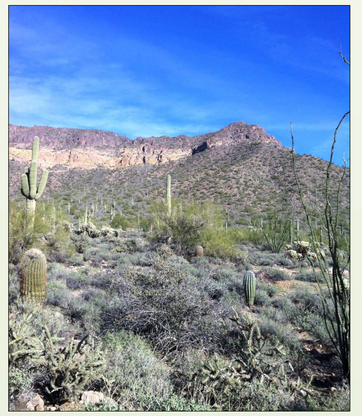


Figure 7: PC2 per park per trail type depicting differences among park habitats.

Discussion and Future Work

- McDowell Mountain Park sustained a major fire July of 1996, sparked by lightening, explaining why parks differ in vegetation cover.
- Results indicate that reptiles (lizards) are not avoiding trails and even some species may prefer the habitat around trails.
- We plan to expand the project by including surveys at additional Mountain Parks.
- This project will allow CAP researchers and students to engage with the recently formed Conservation Alliance which seeks to study, restore, and promote the Phoenix Mountain Park system.

Acknowledgments

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