

INTRODUCTION

- The Sonoran Desert tortoise (*Gopherus morafkai*) is a Tier 1A Species of Greatest Conservation Need found here in the McDowell Sonoran Preserve.
- This species is under increasing pressure from climate change, human activities, and habitat degradation, which may affect their population numbers.
- Through generous support from the Arizona Game & Fish Heritage Fund, the McDowell Sonoran Conservancy is studying the local tortoise population for the first time.
- The 3-year study will give us a better understanding of tortoise movements and activity patterns in this area, as well as factors affecting the population.



OBJECTIVES AND PREDICTIONS

Goal 1: Track movements of Sonoran desert tortoises

- By tracking desert tortoise movements, we can gain a better understanding of how tortoises are using the Preserve and surrounding areas, gauge potential effects of development, and determine if recreation affects their movements. These data will help the Conservancy and the City of Scottsdale make better management decisions to protect the tortoises and the Preserve ecosystem.

Goal 2: Engage the community

- Long-term protection of regional connectivity requires the support of an educated community to help accomplish conservation and research goals and to advocate for science-based management of wildlife. By engaging nearby residents and other members of the public, we can raise awareness of wildlife in the area, as well as threats and opportunities facing those species.

Goal 3: Wildlife Corridors/Habitat Conservation

- As a long-lived species with slow recruitment, tortoises are more susceptible to loss from urban and environmental pressures. Relatively little is known about how urbanization affects tortoises and, hence, what mitigation measures might be most effective.

METHODS

- The study area for this research project is Scottsdale's McDowell Sonoran Preserve (Fig. 1).

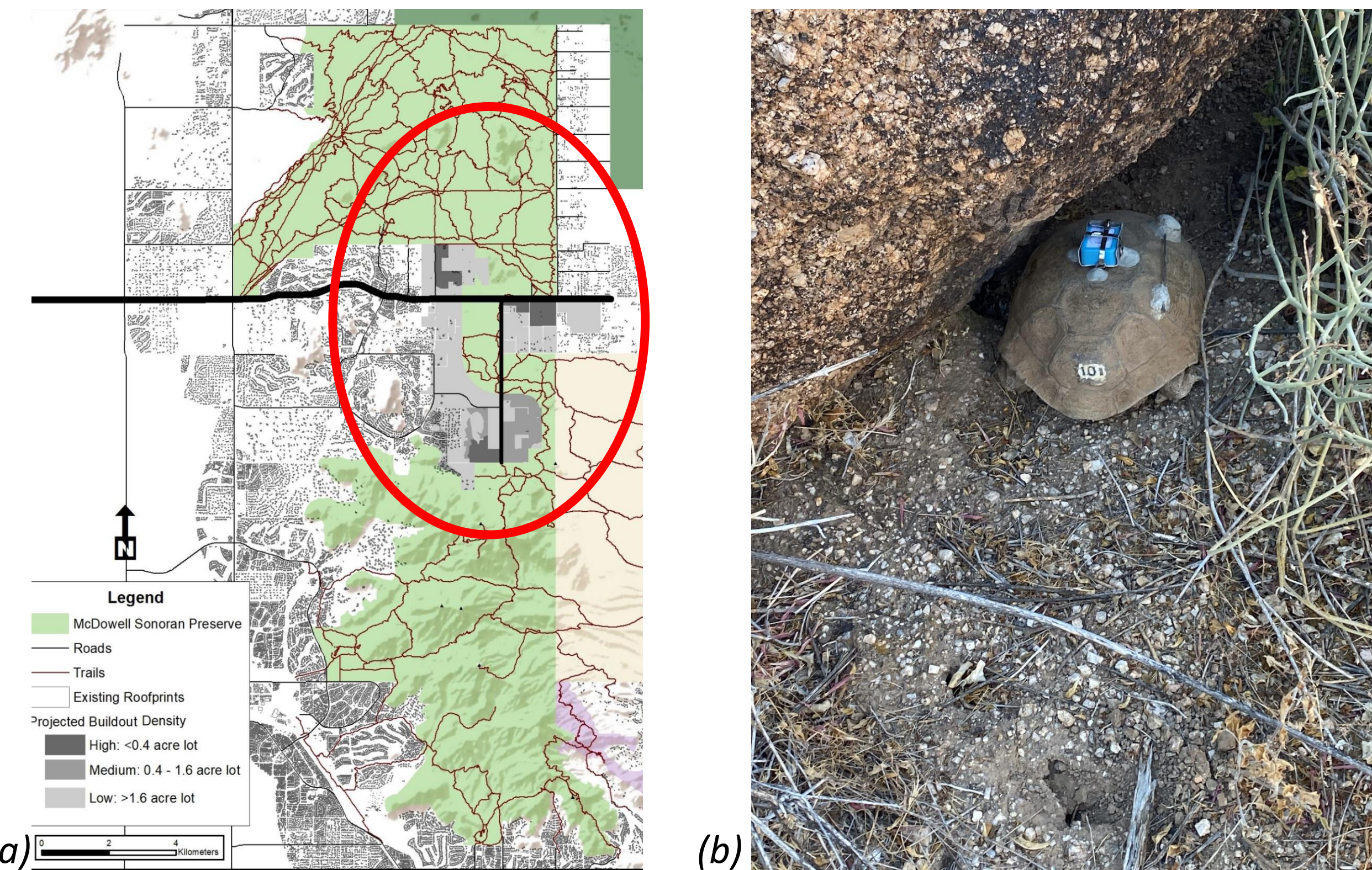


Figure 1. (a) The study area is located in the McDowell Sonoran Preserve (green), surrounded by urban development (grey) and separated by the Rio Verde Drive road (black line); (b) tortoise 101 at the entrance of its burrow in the Preserve.

Sonoran desert tortoise telemetry

- We have conducted 16 large-scale surveys in the Northern Preserve.
- We have attached VHF transmitters and GPS dataloggers to 25 tortoises. We have assessed and marked another 22 tortoises, three of whom are juveniles. Incidental trail reports account for another 25+ sightings.
- Full health assessments are carried out on all marked tortoises.
- The GPS dataloggers record every 30 minutes and are changed out and downloaded every three weeks during the active season to record fine scale movements.

Sonoran desert tortoise population survey

- We continue to document tortoise behavior, habitat and environmental variables during the surveys. This information populates an online map & database that can be accessed by our field leads and Game & Fish partners. It is not accessible to the public to protect location information for this sensitive species.



Figure 2. (a) A citizen scientist uses radio telemetry to locate a tortoise in the Preserve; (b) Tortoise 730 with a transmitter on the right side of the carapace so it can be relocated with telemetry and a GPS unit on top to collect daily movement data.

RESULTS

- We found that daily tortoise movement and distances travelled vary greatly by the individual. Some tortoises stay deep in their burrows and exhibit very little movement. Some exhibit a relatively high number of movements (Table 1).

Tortoise	Sex	Study Area	Start Date	End Date	# Days Tracked	# Movements	Average Movements	Minimum Movements	Maximum Movements
22	F	Brown's Ranch	3/30/2022	6/30/2022	92	38	3	1	9
99	F	Tom's Thumb	5/18/2022	6/30/2022	43	59	3	1	9
101	F	Pima Dynamite	3/28/2022	6/30/2022	94	12	2	1	3
102	M	Brown's Ranch	3/28/2022	6/30/2022	94	22	3	1	7
103	F	Tom's Thumb	3/31/2022	6/30/2022	91	62	2	1	10
130	M	Tom's Thumb	4/13/2022	6/30/2022	78	67	3	1	7
202	F	Tom's Thumb	3/31/2022	6/30/2022	91	62	3	1	6
203	F	Brown's Ranch	3/30/2022	6/30/2022	92	108	5	1	15
210	M	Tom's Thumb	4/13/2022	6/30/2022	78	55	3	1	13
220	M	Tom's Thumb	4/6/2022	6/30/2022	85	13	1	1	2
390	F	Granite Mountain	4/7/2022	6/30/2022	84	43	2	1	8
401	F	Tom's Thumb	4/13/2022	6/30/2022	78	180	5	1	15
403	M	Granite Mountain	4/7/2022	6/30/2022	84	155	5	1	13
420	F	Pima Dynamite	3/28/2022	6/17/2022	81	5	1	1	2
430	M	Tom's Thumb	4/6/2022	6/30/2022	85	66	3	1	15
702	F	Granite Mountain	4/7/2022	6/30/2022	84	24	2	1	4
730	F	Brown's Ranch	3/28/2022	6/30/2022	94	109	3	1	13
999	M	Tom's Thumb	3/31/2022	6/30/2022	91	9	2	1	3

Table 1. Summarized movement data of 18 Sonoran desert tortoises in the McDowell Sonoran Preserve from March – July 2022.

- We also tested motion-triggered trail cameras to detect tortoise activity at two den sites. Through this initiative, we have documented tortoise movement, feeding, and courtship behavior. This initiative has highlighted the importance of Sonoran desert tortoises to the desert ecosystem by capturing photo evidence of other species using the burrows they create (Fig 3). We intend to use these photos as an opportunity to educate and engage the community.

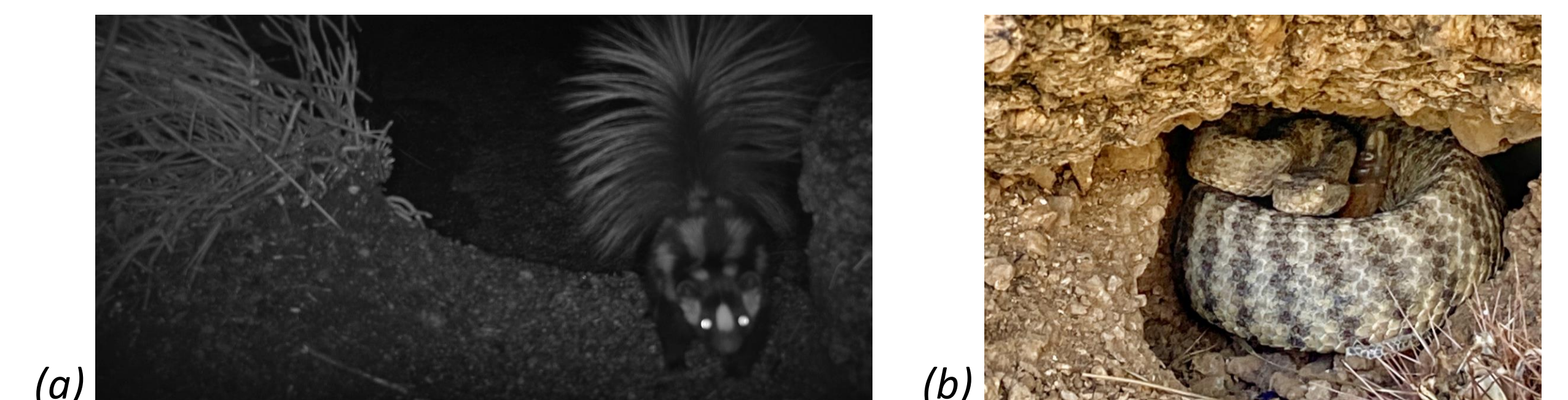


Figure 3. Photos of a (a) western spotted skunk and (b) western diamondback rattlesnake using a tortoise burrow.

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