

Preserving the Connection: Habitat Connectivity in McDowell Sonoran Preserve

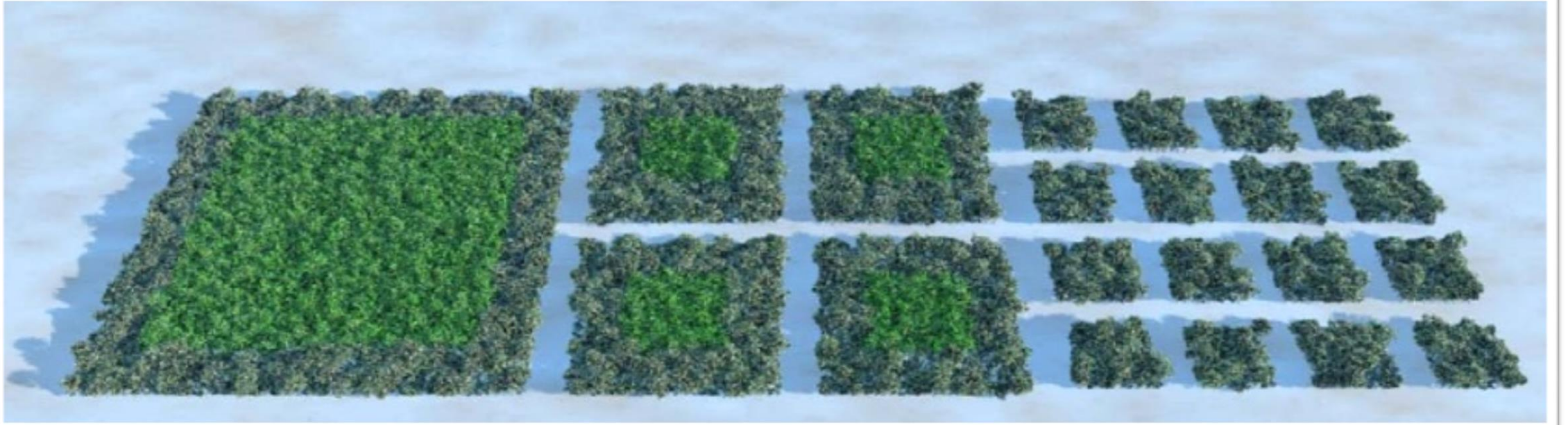
Ralph Lipfert, Tiffany A. Sprague, Helen I. Rowe,
Scott C. Sprague, Katherine C. B. Weiss, Jan Schipper



Photo credit: Lynne Russell

Introduction

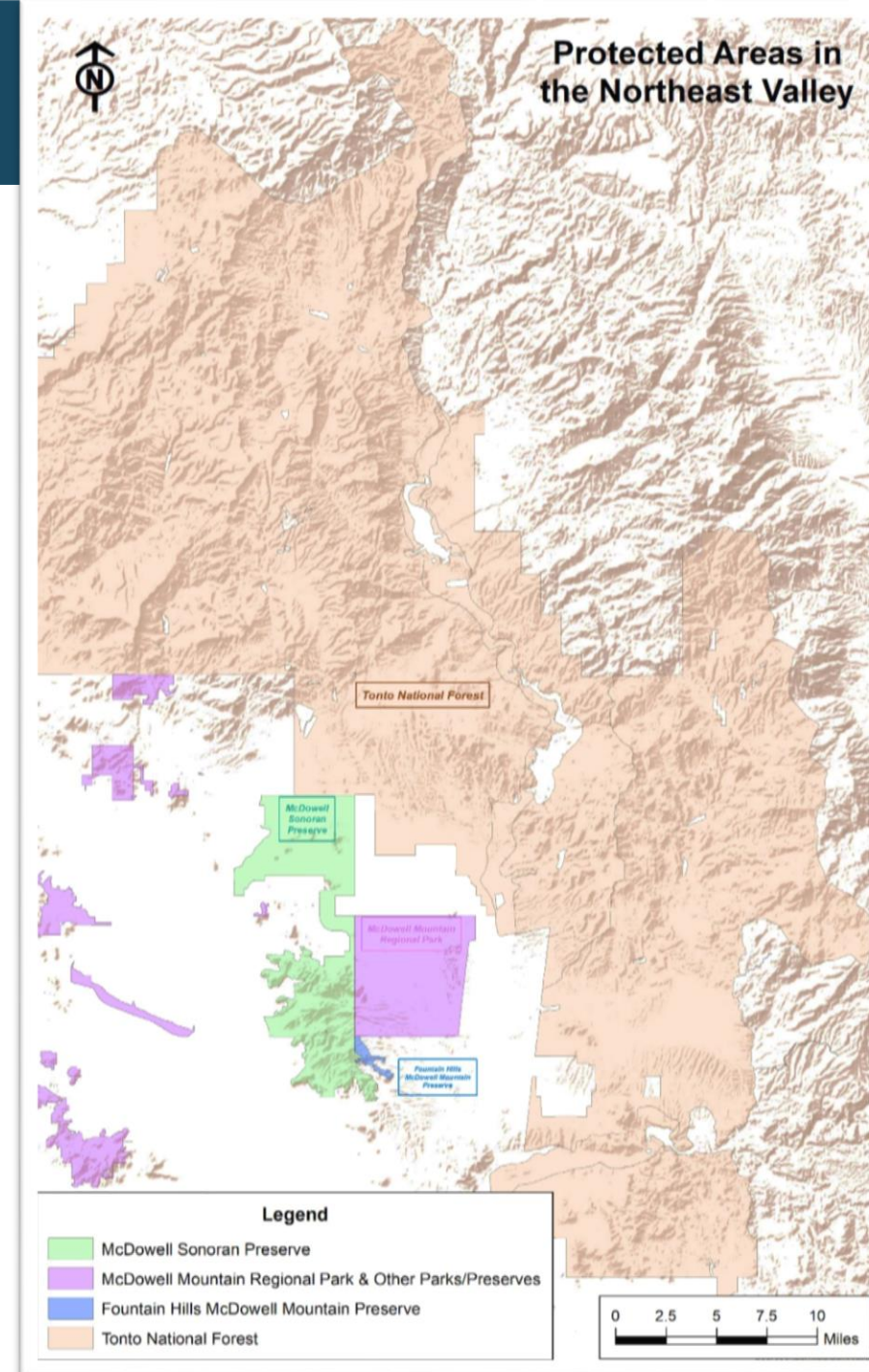
Habitat fragmentation



Contain more species types  Contain less species types

Introduction

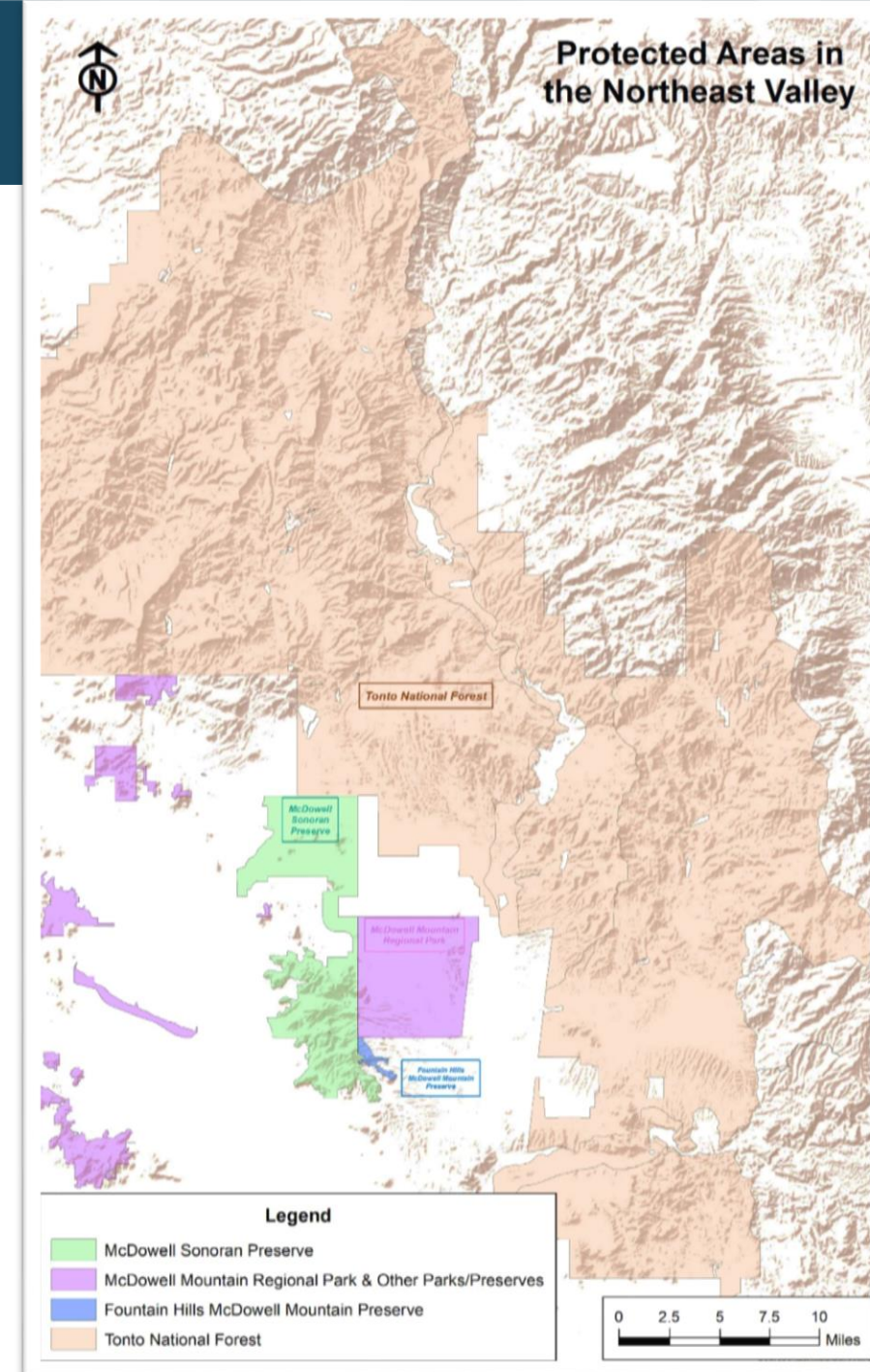
Regional connectivity



Introduction

Regional connectivity

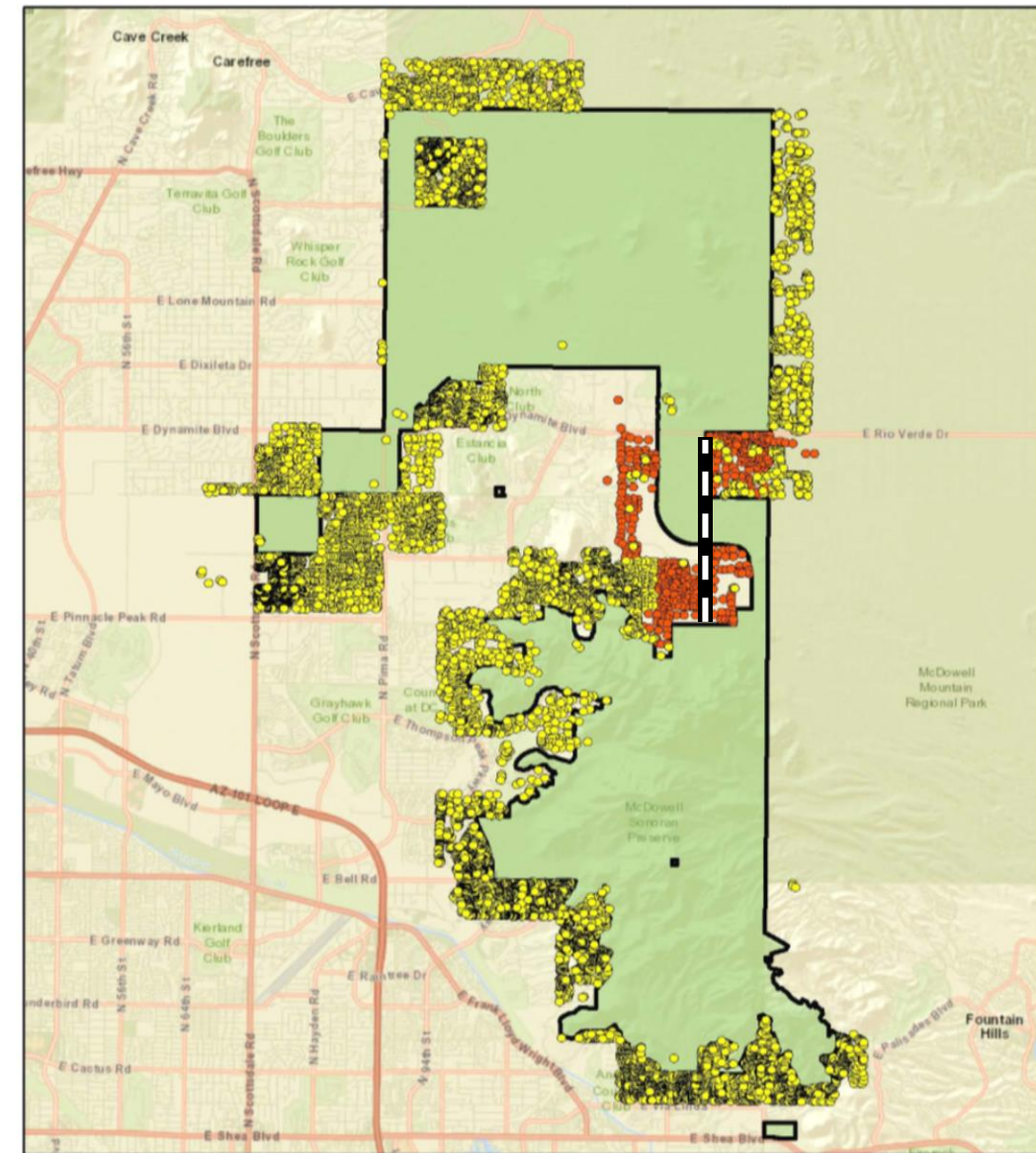
- Nearly 3 million acres of protected lands
 - Tonto National Forest (2.9 million acres)
 - McDowell Sonoran Preserve (30,580 acres)
 - McDowell Mountain Regional Park (20,000 acres)
 - Fountain Hills McDowell Mountain Preserve (1,000 acres)



Introduction

Threatening the corridor

- Area around Preserve being rapidly developed



Legend

- Housing Density
- Potential Buildout
- Preserve Boundary

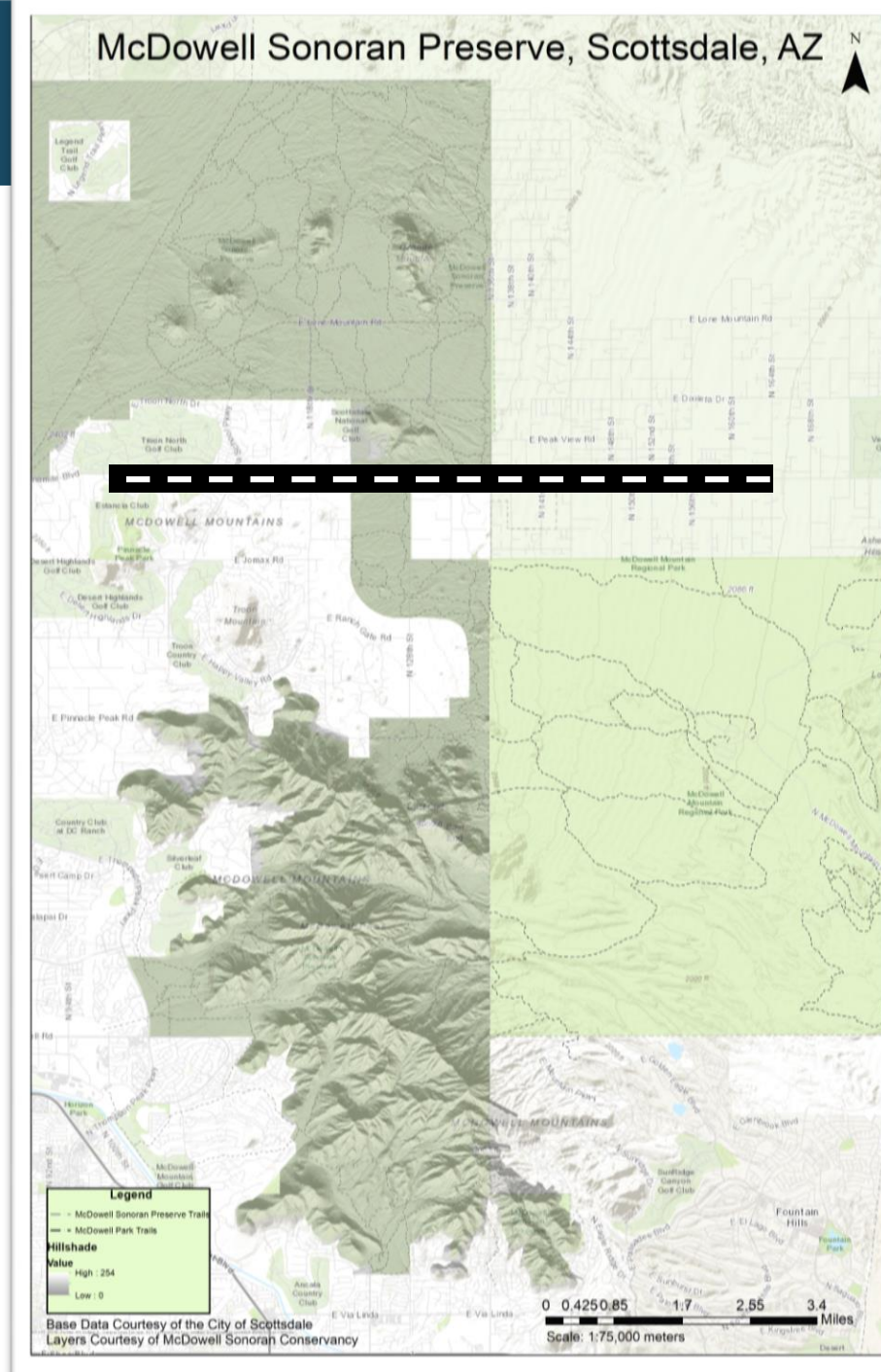
Development near
the McDowell Mountains
Scottsdale, Arizona



Introduction

Threatening the connection

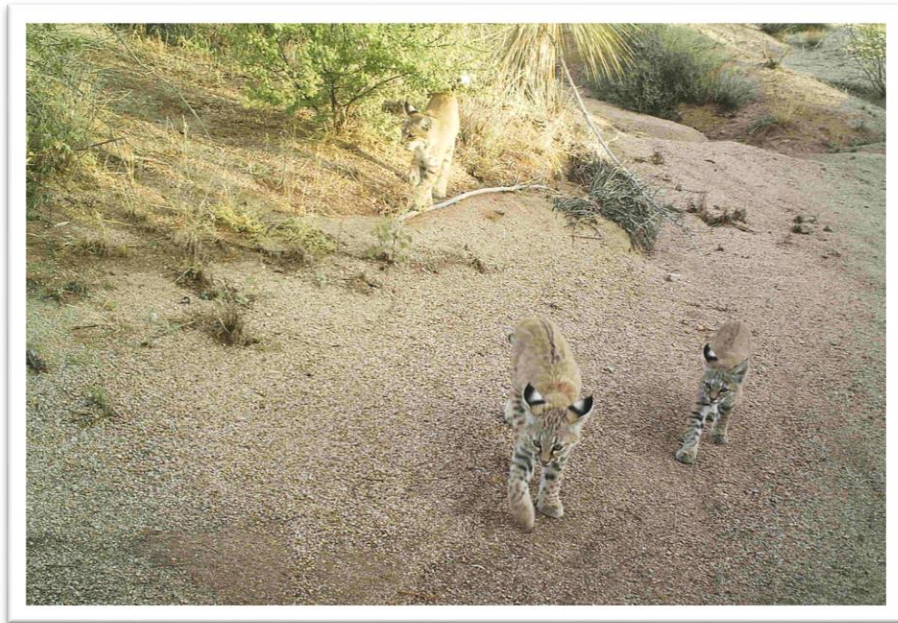
- Rio Verde Dr. cuts through corridor



Introduction

Objective

- Determine viability of Gooseneck Corridor to maintain regional habitat connectivity



Methods

- Mule deer telemetry
- Acoustic monitoring
- Wildlife cameras

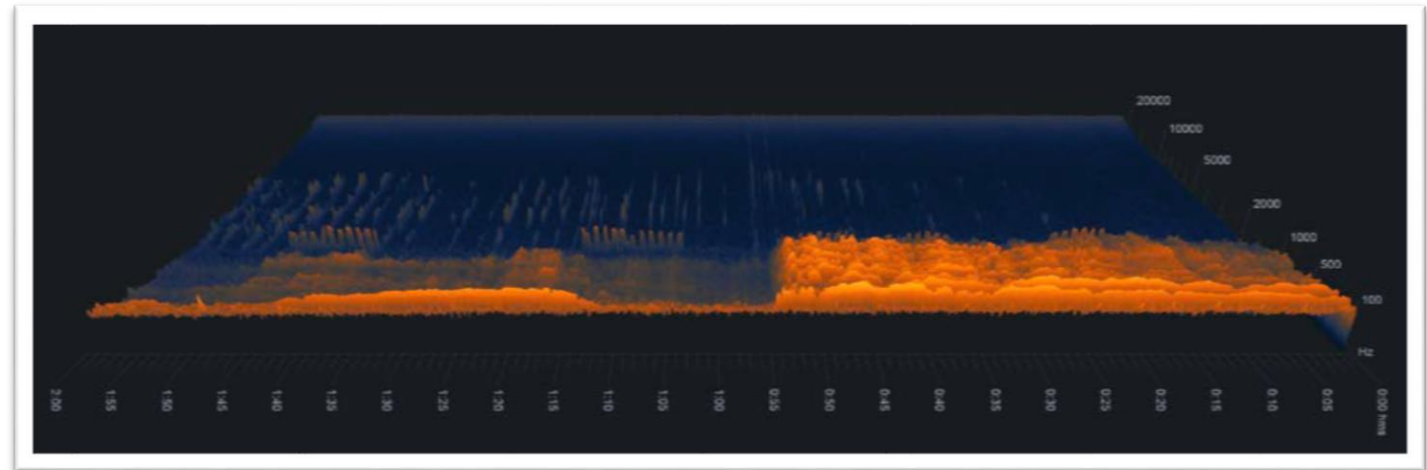


MCDOWELL
SONORAN
CONSERVANCY

Methods

Acoustic monitoring

- *Goal:* Determine how sound propagates across landscape and potential effects of urban noises on wildlife



Methods

Acoustic monitoring

- 12 monitors deployed in conjunction with cameras in Aug. 2018
- Offloaded every 2–4 weeks. (Thanks Bikers!!!!!!)
- Processed by ASU staff and Conservancy volunteers



Results

Acoustic monitoring

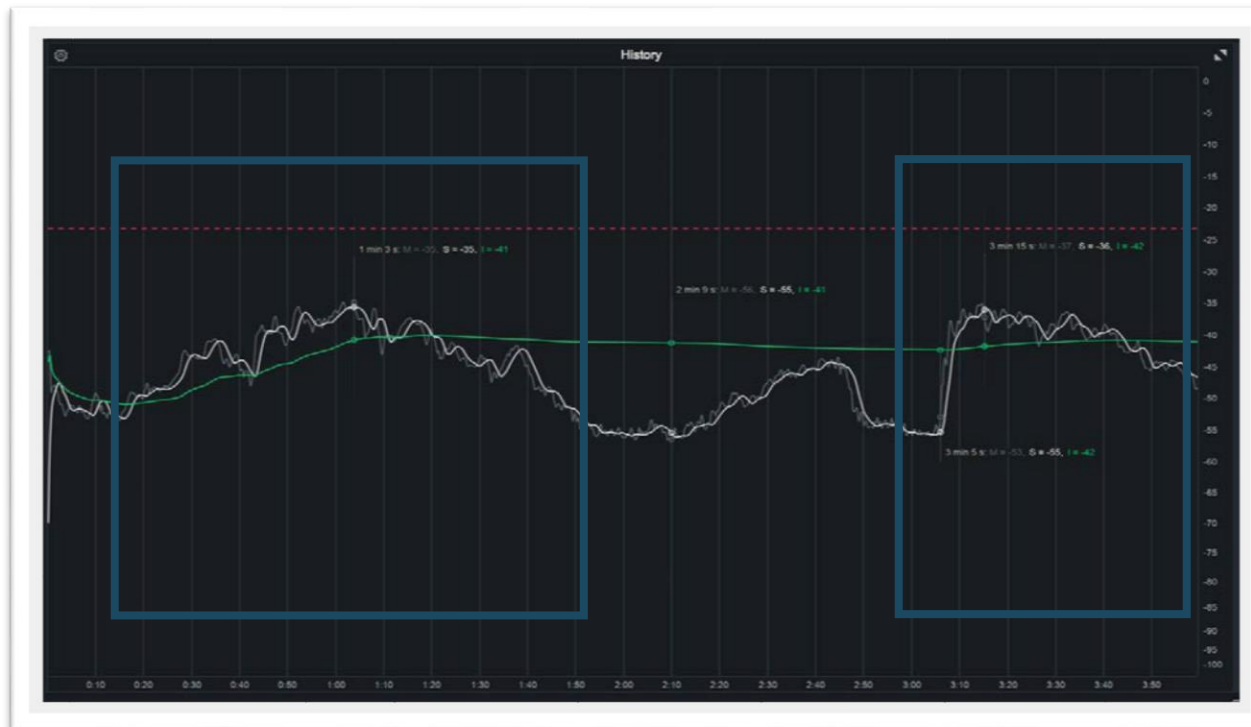
- >10,000 hours of audio recordings
- Preliminary analyses on aircraft noise completed through Nov. 2018
 - Used one monitor for preliminary analyses



Discussion

Acoustic monitoring

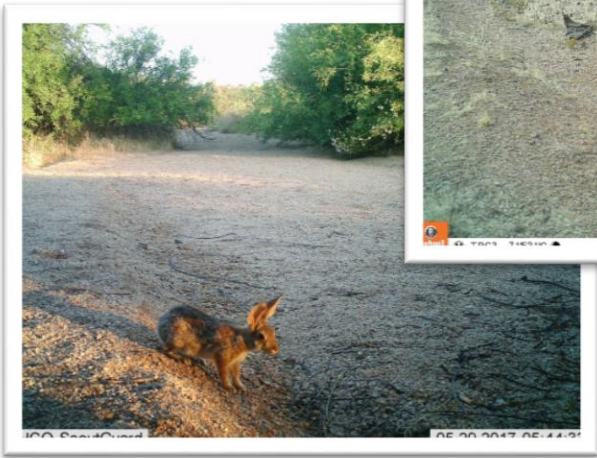
- Aircraft events louder than normal Preserve sounds
- Monitoring continues through Aug. 2019
- Final analyses will include the spectrum of urban noises



Methods

Wildlife cameras

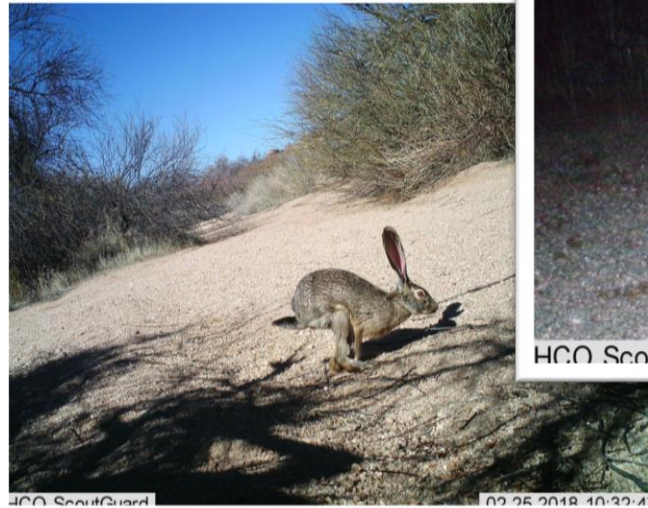
- *Goal:* Compare wildlife composition across Preserve and corridor



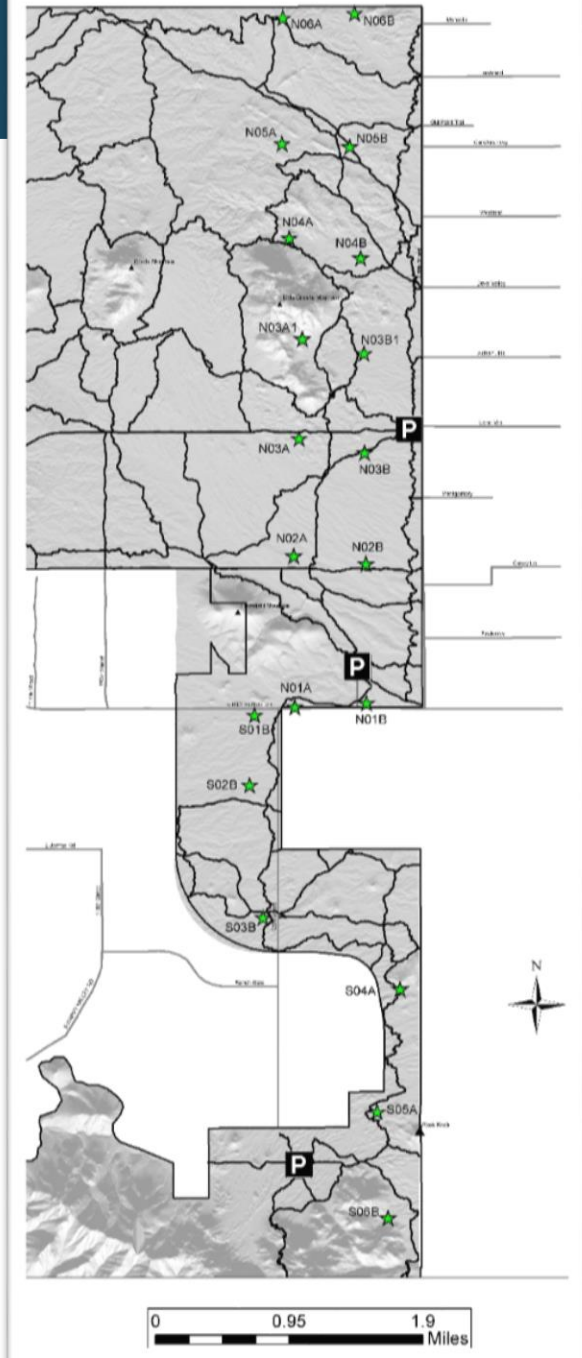
Methods

Wildlife cameras

- 18–20 cameras in Preserve since 2017



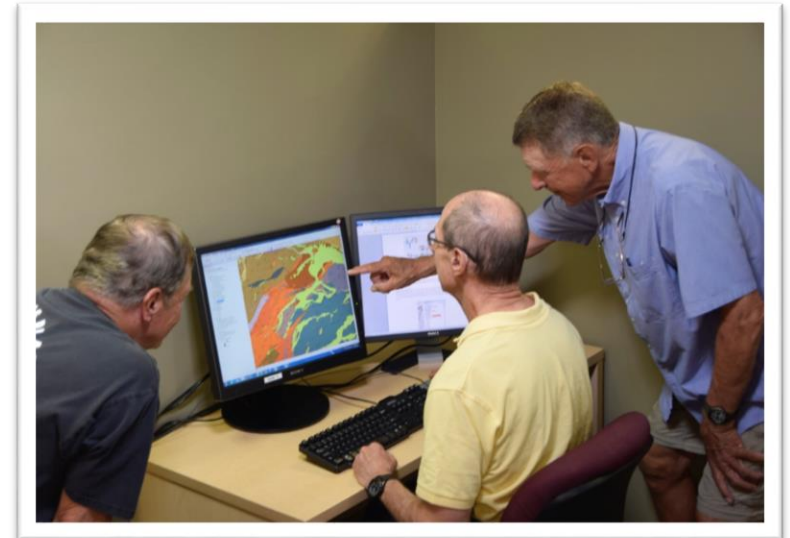
Phase 3 Camera Locations



Methods

Wildlife cameras

- Downloaded bi-monthly
- Volunteers process images
 - Identify species
 - Sort by species and number of individuals
 - Preliminary analyses
- ASU partners further analyze



Results

Wildlife cameras



Decreasing abundance
↓

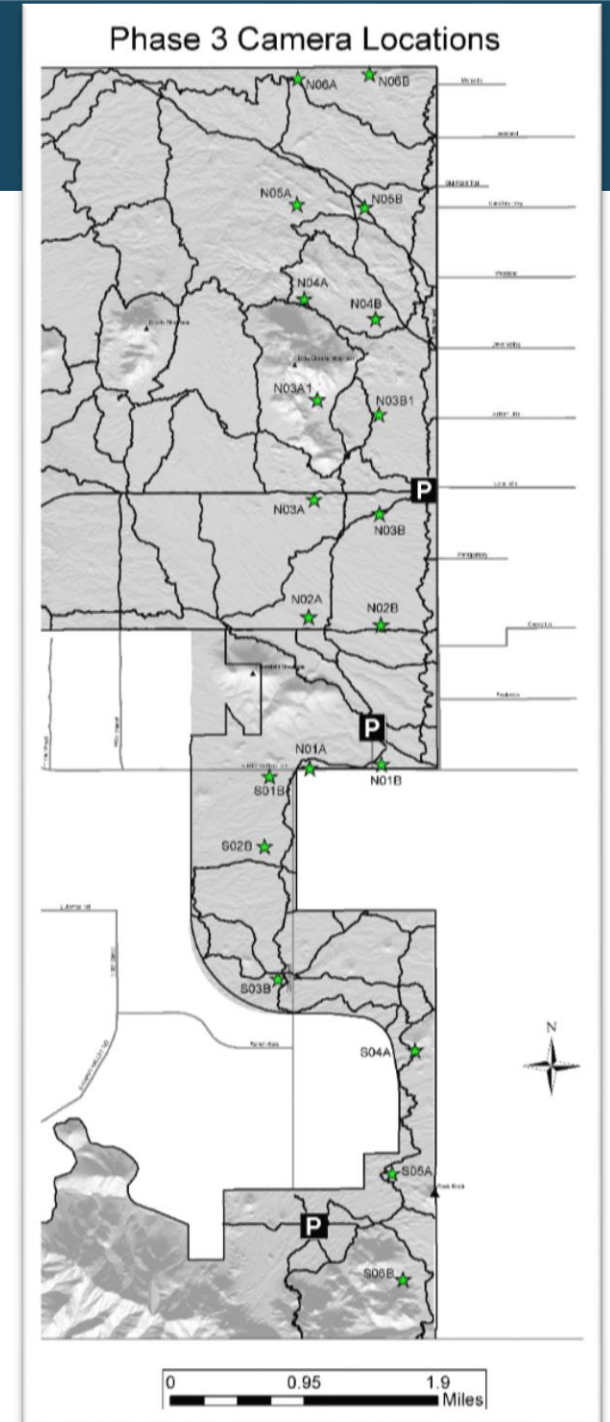
Percentage/# of locations of individuals

Species	Percent	Locations
Cottontail rabbit	29.4	25
Jackrabbit	15.7	26
Coyote	11.5	25
Mule deer	8.2	26
Bobcat	7.5	26
Grey fox	3.0	15
Javelina	3.0	21
Skunk	1.1	12
Badger	.8	17
Mountain lions	.2	6
Raccoon	.06	3

Results

Wildlife cameras

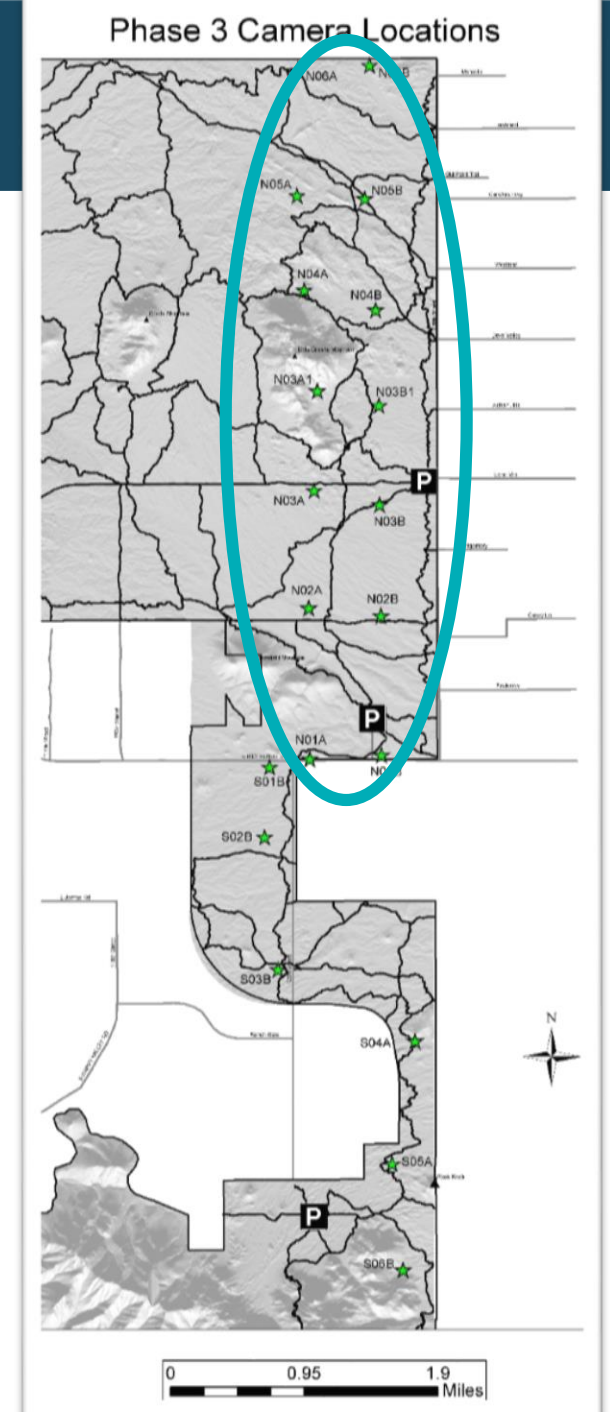
- >250,000 photos!
- >15 species of interest documented
- Preliminary analyses completed for May 2017 – March 2019
- 3 Regions (North, South and Corridor)



Results

Wildlife cameras

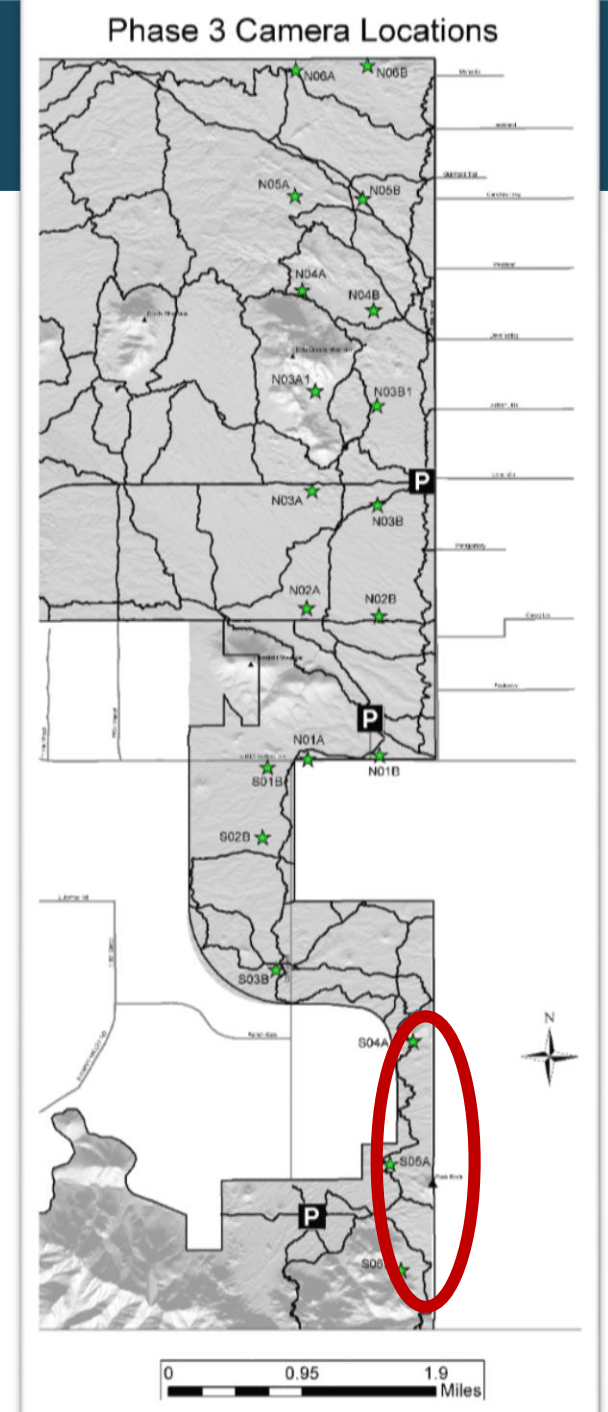
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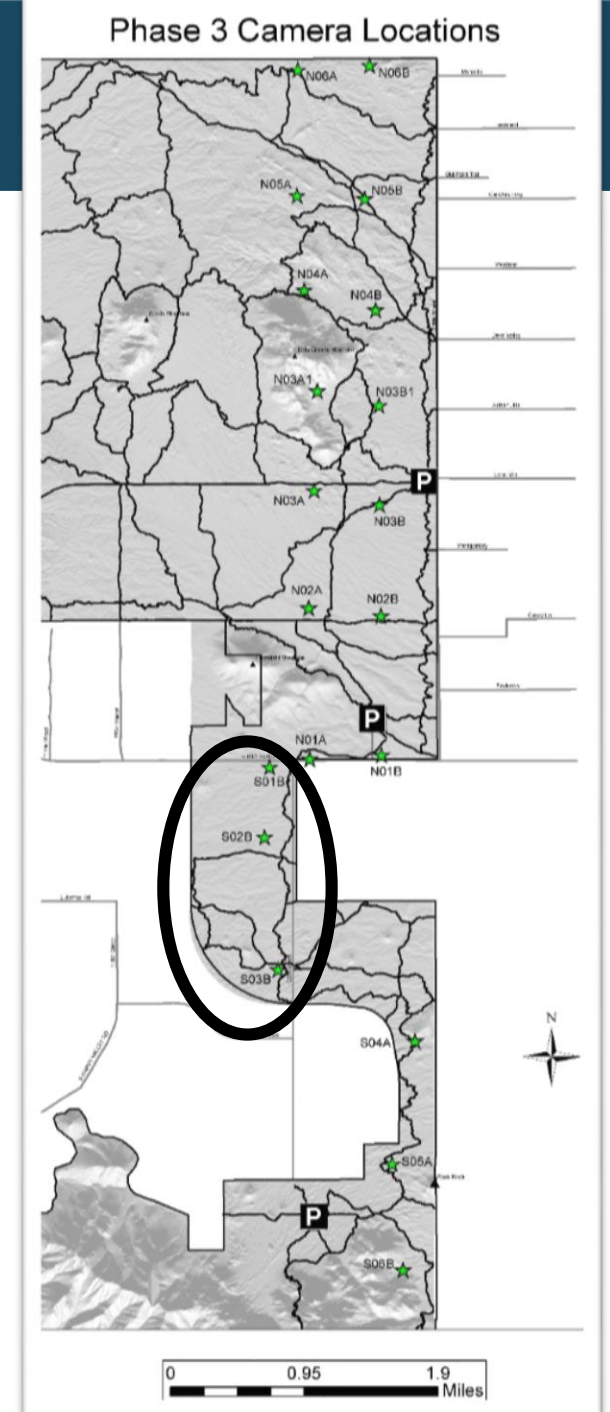
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Results

Wildlife cameras

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Results

Wildlife cameras



Decreasing abundance ↓

Number of individuals in each section

Taxa	North	Corridor	South	Total
Cottontail rabbit	497	391	452	1340
Jackrabbit	499	125	109	733
Coyote	150	173	185	508
Mule deer	212	41	129	382
Bobcat	164	98	78	340
Grey fox	111	2	31	144
Harris's antelope squirrel	47	19	14	80
Javelina	80	10	50	140
Badger	8	15	15	38
Skunk	52	0	2	54
Rock squirrel	11	2	14	27
Mountain lion	2	2	5	9
Raccoon	0	1	0	1

Results

Wildlife cameras



Decreasing abundance ↓

Number of individuals – standardized by number of camera years

Taxa	North	Corridor	South	Total
Cottontail rabbit	26.2	43.4	50	119.6
Jackrabbit	26.3	13.9	12.1	52.3
Coyote	7.9	19.2	20.6	47.7
Mule deer	11.2	4.6	14.3	30.1
Bobcat	8.6	10.9	8.7	28.2
Grey fox	5.8	0.22	3.4	9.42
Harris's antelope squirrel	2.5	2.1	1.6	6.2
Javelina	4.2	1.1	5.6	10.9
Badger	0.42	1.7	1.7	3.82
Skunk	2.7	0	0.22	2.92
Rock squirrel	0.58	0.22	1.6	2.4
Mountain lion	0.1	0.22	0.6	0.92
Raccoon	0	0.11	0	0.11

Results

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Wildlife cameras



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Wildlife cameras



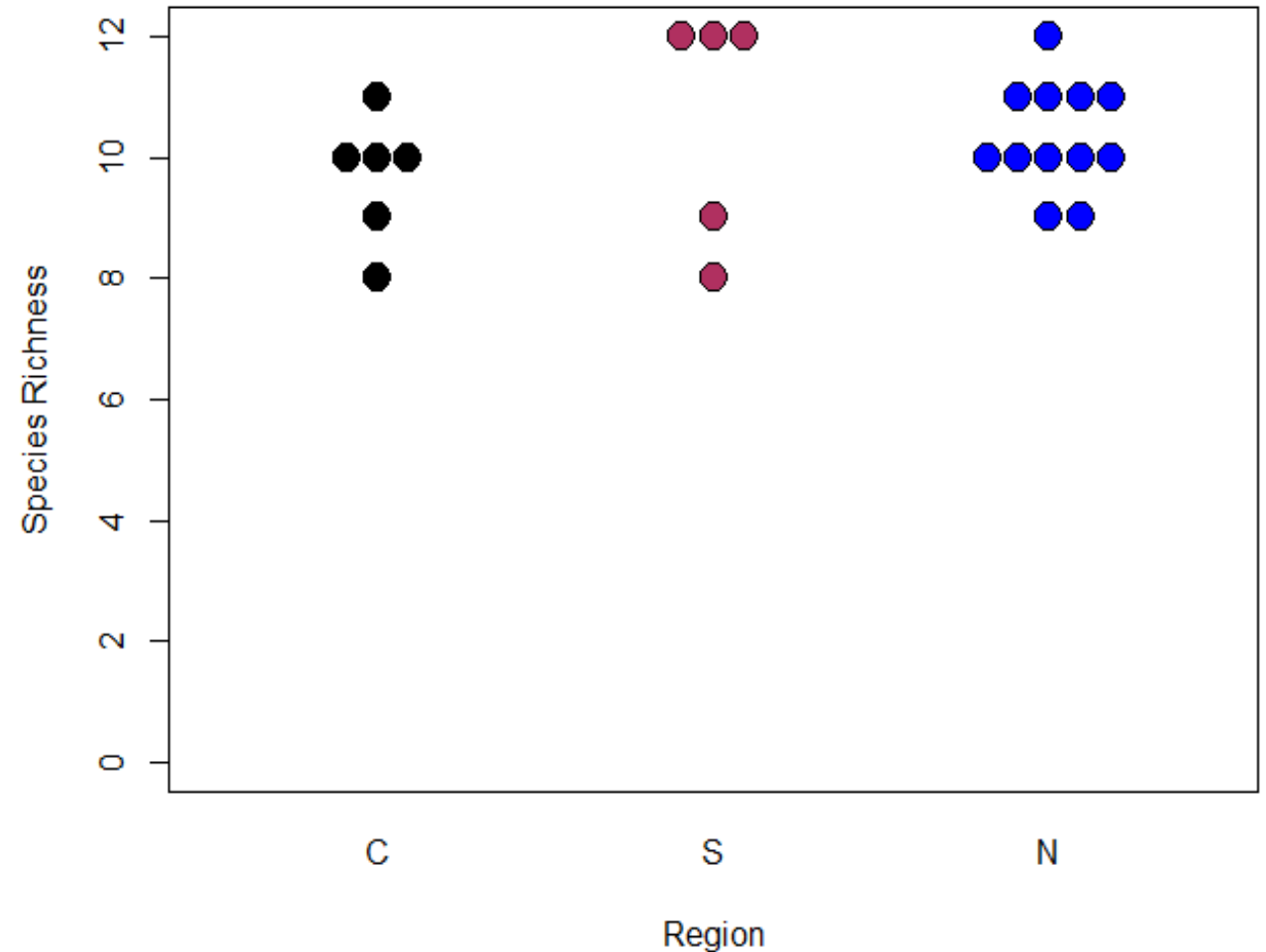
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Results

Wildlife cameras

- Species richness did not significantly differ between regions

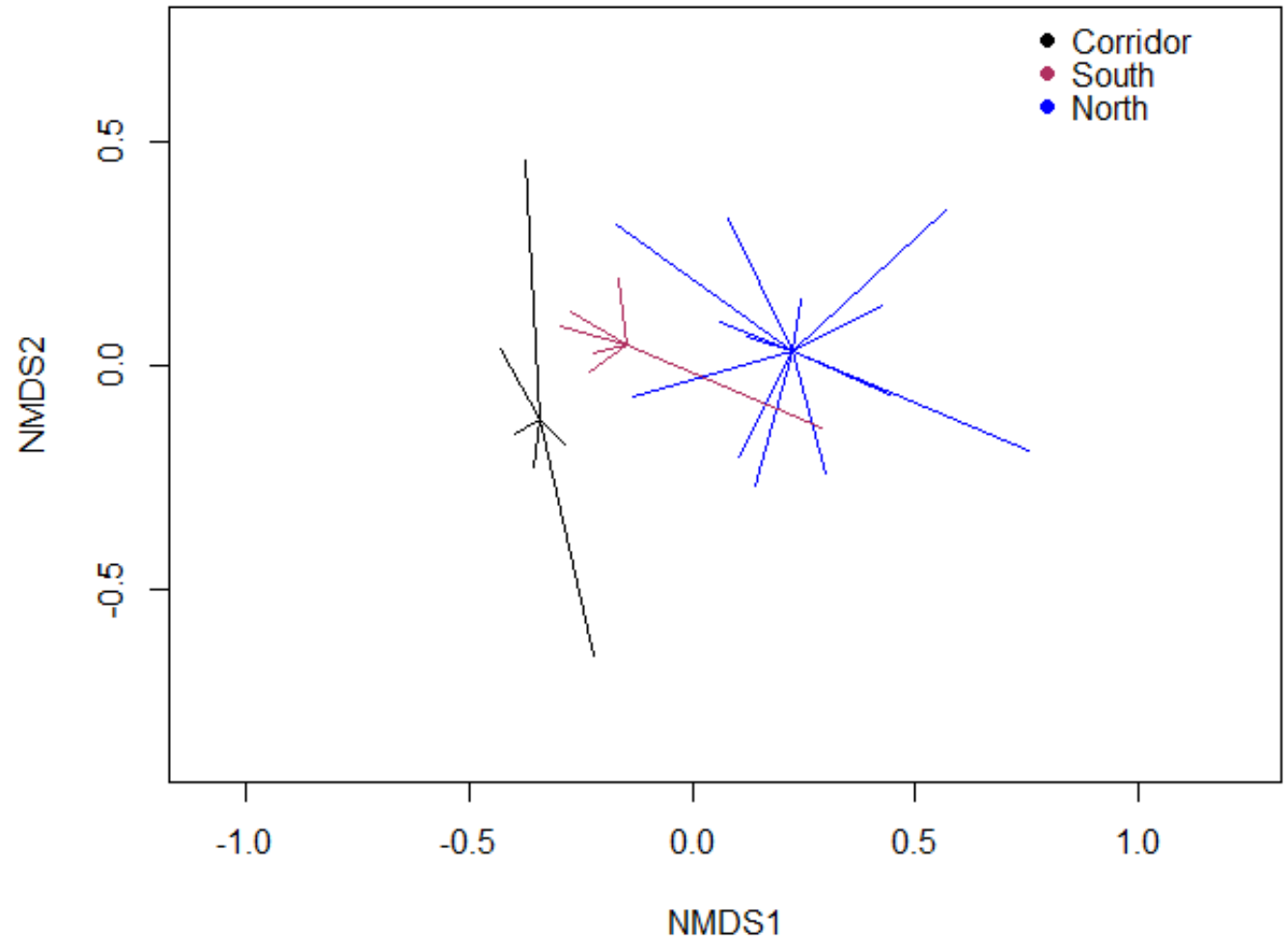
Species richness per camera



Results

Wildlife cameras

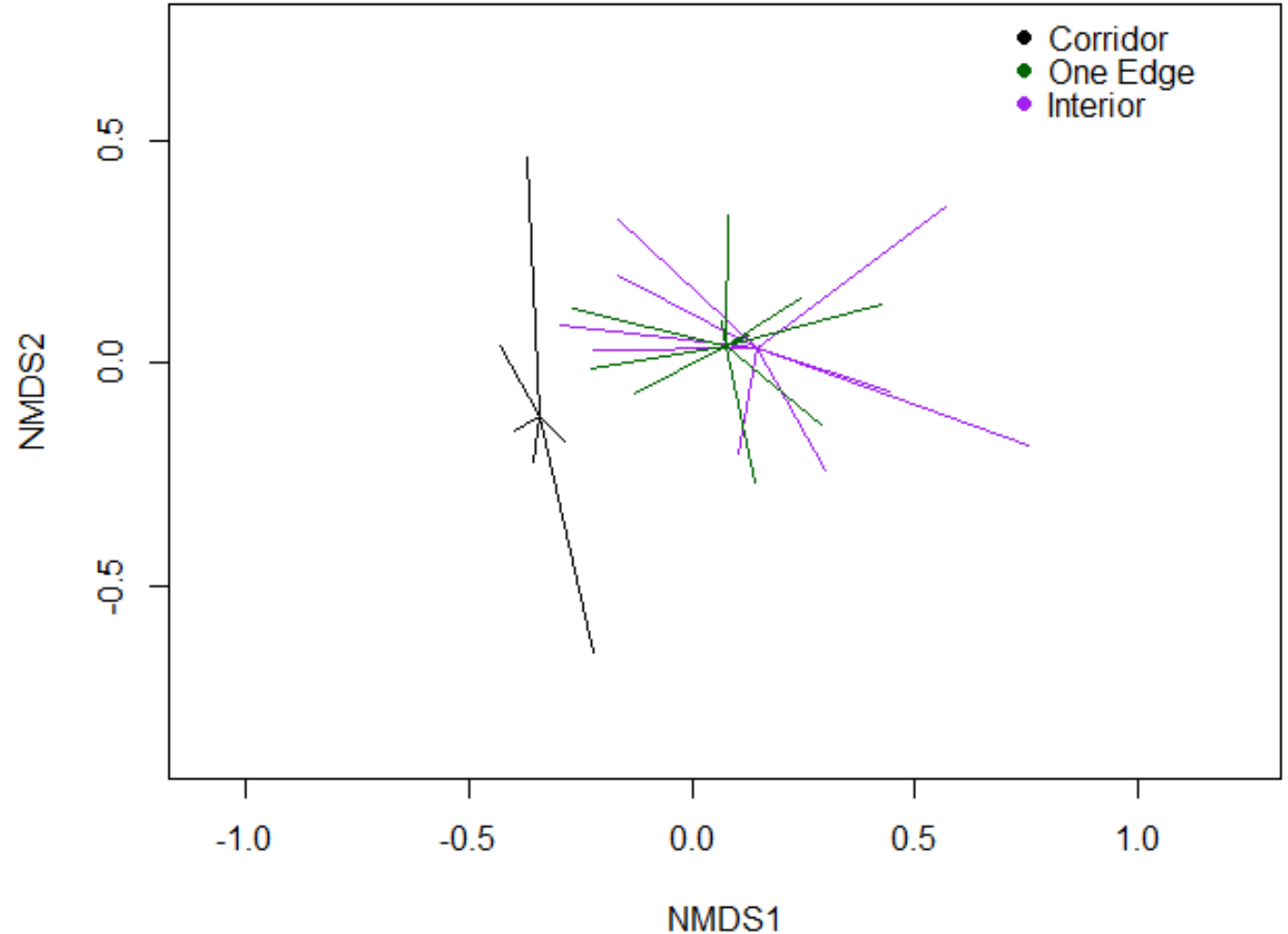
- Mammal communities in each region are largely distinct



Results

Wildlife cameras

- Mammal communities vary as a function of closeness to human habitation.



Discussion

Wildlife cameras

- Robust mammalian community occupies Preserve
- Similar richness in each section, but community composition differs
 - Urban exploiters most common in corridor
- Monitoring and analyses continue



Management Implications

- Better understanding of corridor viability
 - Continued monitoring as development continues
- Work with partners to mitigate negative effects
 - e.g., possible Rio Verde Dr. crossing structure



Acknowledgements



Debbie Langenfeld, Dan Gruber,
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and countless other stewards



Scott Hamilton, John Loleit,
Yvonne Massman, Robert
Graves, Kroy Ekblaw, Bill Murphy



Garth Paine, Jacob Smith



GLOBE CORPORATION



Sue Boe, Dustin Darveau,
Jeff Gagnon, Curtis Herbert,
Haley Nelson, and many others



Count the Coyotes





Five!!



Where can I see more pictures?

At <https://conservancy.smugmug.com>
click on Corridor Project-Best Pictures