Scottsdale McDowell Sonoran Preserve Wildlife Corridor Viability

Ralph H. Lipfert[1], Dr. Jan Schipper[2], Katherine Weiss[2], Dr. Helen Rowe[1], Tiffany Sprague[1]

McDowell Sonoran Conservancy Field Institute[1], Phoenix Zoo[2]

Introduction

The City of Scottsdale, Arizona, established a large urban preserve of more than 30 thousand acres called the Scottsdale McDowell Sonoran Preserve. The Preserve has two major parts: Brown's Ranch in the north and the McDowell Mountains in the south. These two large pieces are connected by a narrow corridor which is intended to provide permanent, undeveloped passage for animals moving between the two larger areas and adjacent protected lands.

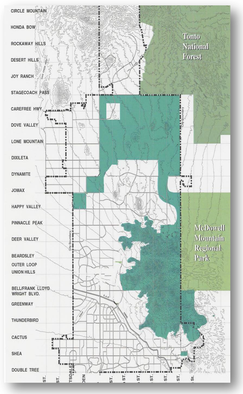

Fig 1. McDowell Sonoran Preserve

Impediments to the free passage of the animals are the narrowness of the corridor, suburban development on both sides of the corridor and a high-speed roadway that bisects the land. Our objective is to use Citizen Scientists to determine the viability of this corridor for wildlife movement between the major Preserve parcels.

Methods

Our Wildlife Corridor Viability project uses an array of motion activated trail cameras and established photo processing techniques[1] to estimate populations of selected species. Our study area ranges from the north end of the McDowell Mountains to the boundary of the Tonto National Forest, a total north-south distance of almost nine miles.

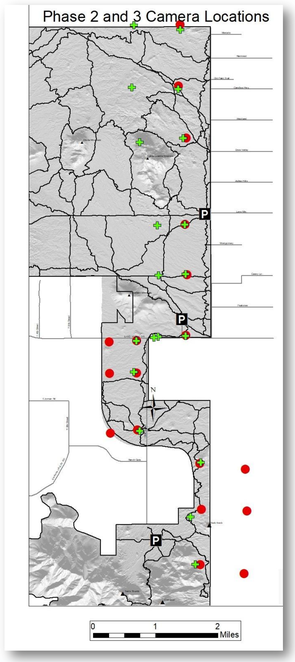

Fig 2. Wildlife camera locations in McDowell Sonoran Preserve and adjacent McDowell Mountain Regional Park.

Fig 3. Typical trail camera installation
Photo: R. Lipfert

Field Work

Once exact placements for the individual cameras are selected, all of the routine field work is performed by trained Citizen Scientists. The project currently has 18 cameras in the field that are periodically visited by Citizen Scientists to exchange SD type data cards and renew batteries.

Fig 4. Camera installation using a metal stake.
Photo: D. Langenfeld

The field work is an exacting series of routine tasks. Cameras must be

- Set properly to established sensitivity, numbers of pictures taken, reset period and correct date and time, among other choices.
- Turned on and double checked in the "on" position.
- Attached to a metal pole or suitable vegetation and fixed in position using the locking device and a strap.

Fig 5. Checking camera field of view with cell phone.
Photo: D. Langenfeld

Once the camera is in place, the field of vision is checked with a cell phone camera to ensure that the camera takes reasonably consistent pictures over successive time periods between maintenance events. This method also helps to identify potentially interfering vegetation that needs to be trimmed.

Computer Download and Analysis

Pictures taken are downloaded to the Conservancy computers and appropriate analysis accomplished by a specially trained group of Citizen Scientists.

Fig 6. Computer picture analysis
Photo: R Lipfert

Analysis of the pictures is done by establishing a four level data base.[1] Using Windows Explorer with large icons and a preview pane, pictures are accurately categorized and then dragged and dropped into appropriate folders.

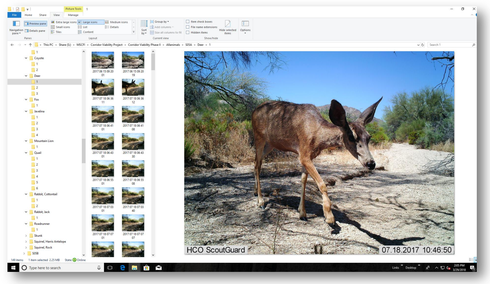

Fig 7. Three column analysis format

Once the pictures have been properly reviewed and sorted into folders, we double-check to ensure the database has the correct four level architecture using DOS program "Data Organize".[1] The results of that check are fed into a simple DOS compilation program called "Data Analyze"[1] that produces a wide variety of statistical information.
:

Location	Bobc	Coyo	Deer	Fox	Jave	Moun	Quai	Rabb	Rabb	Skun	Rich
N01B	7	22	2	0	1	0	56	20	5	1	10
N02B	15	0	1	3	1	0	11	15	22	0	9
N03B	26	25	21	11	0	0	2	25	21	2	11
N04B	6	11	16	11	6	0	3	26	23	4	10
N05B	3	27	57	4	6	0	33	86	96	5	11
N06B	0	3	5	13	2	0	1	15	20	2	8
S01A	2	6	1	0	0	0	11	21	0	0	6
S01B	5	13	0	1	0	0	9	117	3	0	8
S02A	10	28	4	0	2	0	56	14	32	0	10
S02B	19	29	3	1	0	2	2	4	8	0	10
S03A	6	10	2	0	0	0	17	11	13	0	10
S03B	30	30	8	0	1	0	246	139	11	0	10
S04A	2	7	2	0	1	0	2	23	4	0	8
S04B	4	51	22	1	7	0	69	62	54	0	12
S05A	15	29	39	1	8	1	40	45	0	1	12
S05B	14	32	12	0	11	1	16	14	20	0	12
S06A	5	12	5	0	1	0	1	6	9	0	8
S06B	15	4	20	24	1	1	10	142	2	1	13
Richness	17	17	17	10	13	4	18	18	16	7	

Fig 8. Example output from Data Analyze showing species richness by camera location. This is one record of each species per location per period. Only a partial listing of species tracked is shown.

Results and Implications

The first year of this project has yielded interesting results. The presence in the study area of certain species, such as mountain lions, two kinds of skunks and grey foxes, have been clearly documented. Although seen before, results show badgers are more common and have a larger range than previously thought.

Fig 9. Picture taken at location N02B

This project is noteworthy in that all of the field work and the photographic categorization is being done by Citizen Scientists of diverse backgrounds, none of whom is a trained biologist. All of the project protocols and support documentation were developed using collaborative methods and refined based on both field and computer analysis experience. Results of this project will help determine appropriate management of the connector to provide a long-term movement corridor for the Preserve's wildlife.

References

[1]Sanderson, J. and G. M. Harris (2013). Automatic data organization, storage and analysis of camera trap pictures; Journal of Indonesian Natural History 1(1):11-19

[2]www.smallcats.org (This site contains downloadable copies of the DOS programs used in this process.)

Fig 10. Dressed for the field
Photo: D. Langenfeld

Acknowledgements

City of Scottsdale, Arizona

Field coordination
Jerry Holden

Data analysis coordination
Michele Rifkin

Field Team Leader
Jack McEnroe

Many other stewards have contributed time and talent assisting in field crew operations and photo analysis.