BUILDING BRIDGES FOR WILDLIFE

Modeling the richness of human-wildlife encounters over 15 years of urban growth in the Sky Islands

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INTRODUCTION

Based on data on land cover change and wildlife tracking surveys, this study brings together knowledge from urban development and wildlife conservation to **explore the history and future of human-wildlife encounters in the natural linkages of the Madrean Archipelago landscape.**

METHODS

This study consists of a mixed methods approach that utilizes both a quantitative and qualitative analysis of data gathered between 2001-2015 in the Madrean Archipelago Region.

There are more than 40 transects in Sky Island Alliance's Wildlife Linkages Program. These sites are surveyed every month by citizen scientist volunteers who collect data on wildlife signs (tracks, scat, kills, sightings, etc.).

Using ArcMap, the data from these sampling sites were analyzed to determine the average number of species detected per visit to each transect. The resulting value, average detection per visit (ADPV), enables the **comparison of sites that are more or less likely to present rich human-wildlife encounters**.

P-values were calculated to determine whether there was a significant difference in the richness of human-wildlife encounters (ADPV) over 15 years of land cover change.

THE CHANGING LANDSCAPE

As the built environment encroaches on undeveloped areas, planners are recognizing the importance of considering the natural environment in land use development.

The National Land Cover Database documents land cover change every five years since 2001. The graphs to the right show land cover and impervious surfaces in Southern Arizona in 2001 and 2011. The bubbles represent data on wildlife presence as detected through non-invasive survey methods by Sky Island's Wildlife Linkages Program.

Fig 1. Land Cover 2001

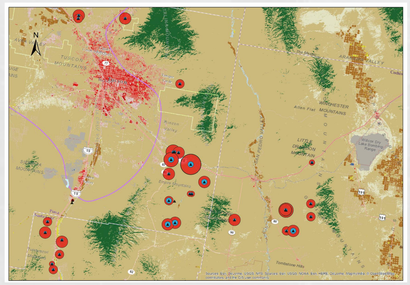


Fig 2. Land Cover 2011

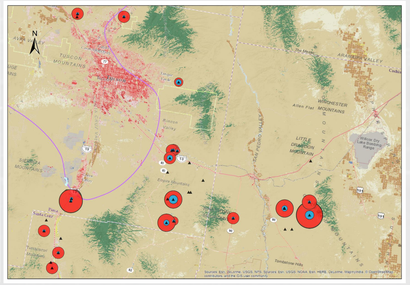


Fig 3. Impervious Surfaces 2001

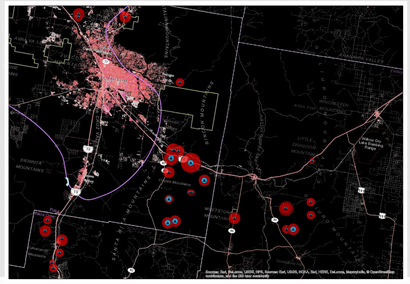
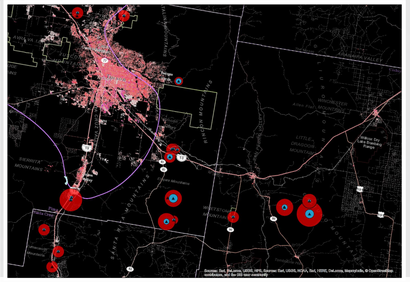


Fig 4. Impervious Surfaces 2011

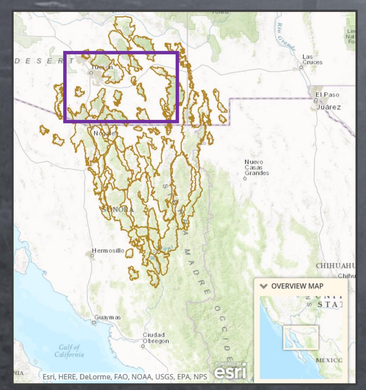


Average number of species detected in transects between 2001-2011 (fig. 1 & 3) and between 2011-2015 (fig. 2 & 4) in relation to land cover and impervious surfaces. Bigger bubbles represent higher richness of species per visit.

SKY ISLANDS

The Madrean Archipelago, also known as the Sky Islands, spans four states and two countries. They are biodiversity hotspots among the desert 'seas' of Southern Arizona, Southwestern New Mexico, and Northern Mexico.

There are over 7000 species of plants and animals across the region's 57 mountain islands. Wildlife within the region are not isolated to the mountains. Therefore, natural connections between the mountain ranges are crucial to the longevity of native species.



Aerial view of Sky Island mountain ranges provided by skyislandalliance.org. Site study outlined in purple.

MOVING FORWARD

As populations in Southern Arizona continue to grow, the built environment will inevitably expand. Developers and government entities are taking measures to mitigate impacts of urban expansion, including the recent addition of a wildlife crossing overpass and underpass in Oro Valley. These cross-disciplinary bridges in urban planning and environmental conservation enable humans and wildlife species to coexist in the dynamic landscape.

CONCLUSION

The results concluded that there was no significant difference in the richness of human-wildlife encounters after a decade of land development. This insignificant change in richness should be celebrated and further investigated to 1) confirm the results of this study and 2) to investigate what actions in urban development and conservation in the region may have played a role in preserving the richness of the region.

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