Assessing the influence of income and ethnicity on wildlife in residential neighborhoods

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Background & Research Question

Wildlife communities are structured by numerous ecological filters in cities that influence their populations[1,6]. The "luxury effect" describes the positive relationship of urban biodiversity to income[2,3,4]. Other socio-demographic drivers of wildlife presence or absence may be masked by income, such as ethnicity[3,5,6,7]. Lower socio-economic status populations are understudied in ecological research, but experience inequitable ecosystem services and biodiversity within their neighborhoods, especially in dryland ecosystems[8,9]. In Phoenix, low-income Hispanic residents experience fewer native bird and plant species.[7] Ethnicity and income may be indicators of behaviors or landscape patterns that impact urban wildlife. We aim to investigate landscape and socio-demographic factors that may influence wildlife presence within neighborhoods throughout the Phoenix-metro area.

Q: How does neighborhood income and ethnicity independently affect wildlife community composition in neighborhoods across the Phoenix metro area?

H1: Wildlife richness will positively correlate with average neighborhood income.

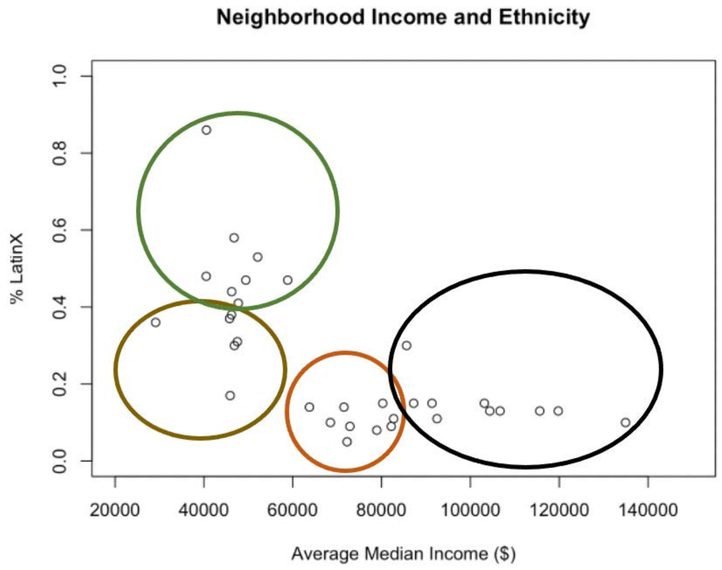
H2: Wildlife community composition will vary between income and ethnicity of neighborhoods.

Site Selection

We used neighborhood parks as centroids for a 1km buffer in which we calculated median incomes and ethnicities using American Community Survey data. We selected parks if they fell into one of four categories independently and were 2km away from a desert park.

Category	Parameter used
High income	> $85,000
Low income	< $48,000
High LatinX	> 43% Residents
Low LatinX	< 15% Residents

Site Selection (cont.)



We visited each potential park in person and selected the most optimal camera locations.

Methods & Preliminary Data

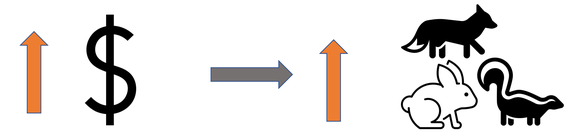
We will deploy 33 motion activated cameras at sites across the Phoenix-metro valley in community parks for a 3-month period with 1 camera within each park.

Current: We've deployed 22 cameras in Chandler, Phoenix, Glendale, and Scottsdale in all neighborhood categories.

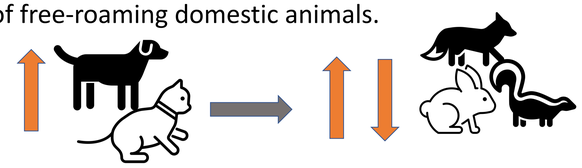
Species count: Mammal = 9, Domestic mammals = 3

Predictions & Next Steps

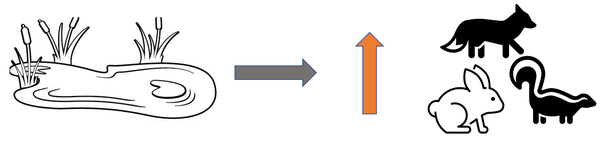
P1: Mammal species richness will be highest in parks within higher income neighborhoods, like patterns for birds and plants.



P2: Wildlife communities will differ between dominantly LatinX and White neighborhoods independent of income, potentially related to the distribution of free-roaming domestic animals.



P3: Irrigation and water features in parks will increase species richness.



Next Steps

1) Complete camera deployment and analyze photo data using the CPW photo warehouse.

2) Execute occupancy modeling analyses utilizing continuous covariates of income and ethnicity as well as environmental covariates.

3) Utilize results to compare wildlife distribution findings to socio-demographic variables in PASS data to inform future research questions.

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