Do Attitudes Toward Native Flora Predict Landscaping Choices in Privately Managed Urban Landscapes?

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Background

Urban landscaping choices have a significant influence over local biodiversity, ecosystem functioning, and ecosystem services[1,2,3]. Understanding the plant composition of urban landscapes and the motivation for landscaping choices is integral for guiding the future of ecosystem service provision in cities. Socioeconomic, normative pressures, and preferences for various plant attributes have been studied as drivers for landscaping choices[2,4,5,6]. However, few studies have explored the drivers behind private land owners' decisions to landscape with native flora specifically. We set out to understand what predicts individuals' decisions to include native plant species in privately managed front yards, using Phoenix, AZ as a case study.

What determines whether or not native plants are found in residential yards in the Phoenix metropolitan area?

H1: Resident's attitude toward native plants determine whether or not native plants are included in yard landscaping.

H2: Resident's attitude toward the desert determine whether or not native plants are included in yard landscaping.

H3: Landscape style determines whether or not native plants are included in yard landscaping.

Methods

Over the summer of 2018, we conducted a resident survey (n = 105) and a vegetation survey (n = 417).

Resident Survey

Residents were asked how strongly they disagree with (1), agree with (5), or feel neutral about (3) the below statements concerning native plants and the desert. These were averaged to form an index for each variable.

Attitude toward native plant species (α = 0.44)
• "Native plants in residential areas are unsafe"
• "Native plants do not belong in the city"
• "Native plants are beautiful"

Attitude toward the desert (α = 0.95)
• "The desert is a very special place to me"
• "The desert is beautiful"
• "The desert is a nice place to spend time"

Survey response rate: 26%

Vegetation Survey

• From the sidewalk, front yard plants excluding weeds and turf grass, were identified to lowest possible taxa.

• Plant species were classified as native or non-native to the Sonoran Desert.

• Yards were categorized by landscape style.

Linear Model

Response variable
• Proportion of native species in front yard landscaping

Predictor variables
• Indexed attitude toward native plants
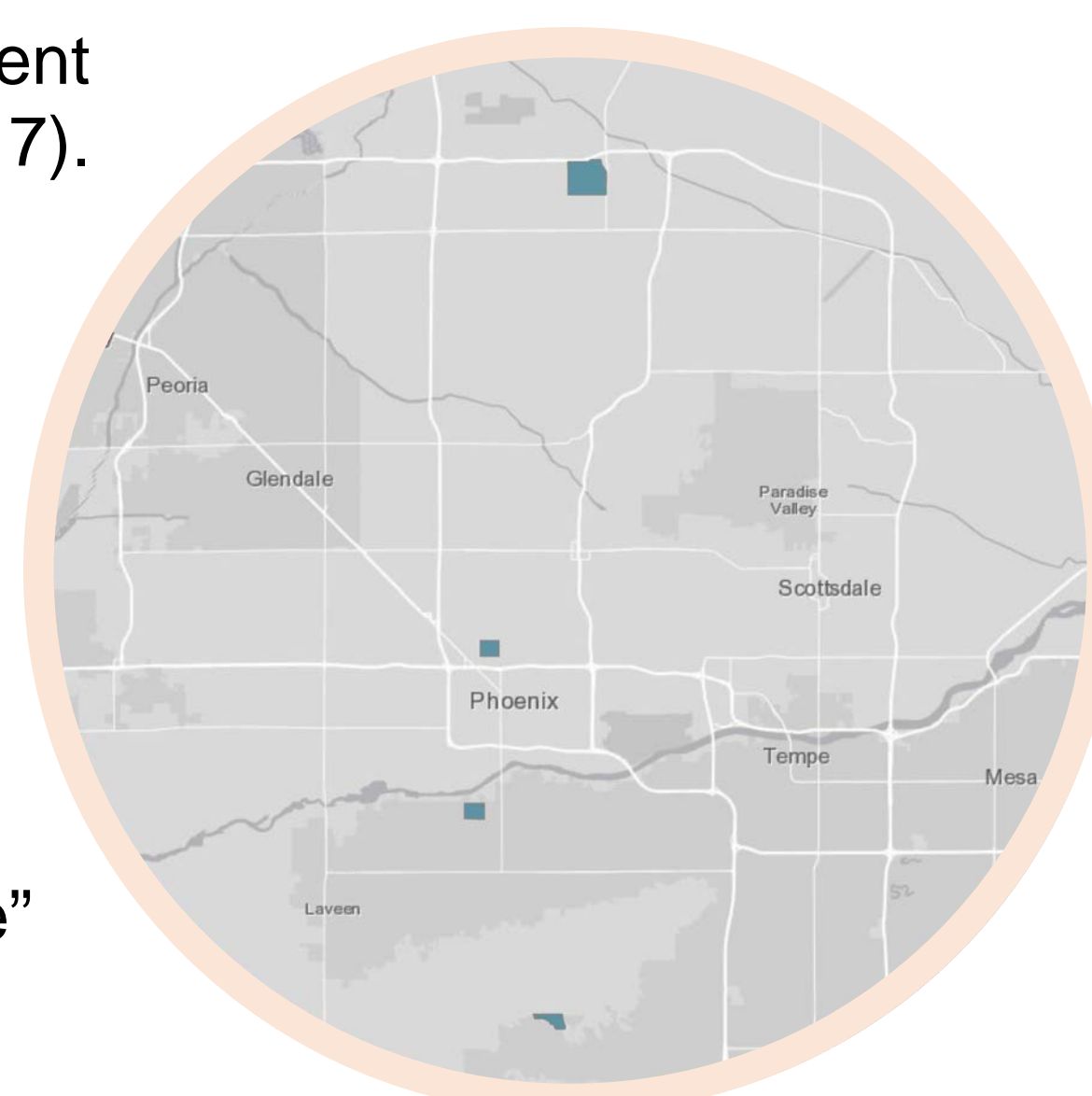• Indexed attitude toward the desert
• Landscape style

Figure 1. Map of metropolitan Phoenix area showing location of neighborhoods in blue.

Figure 2. The Sonoran Desert region used to classify plant species nativity. Map source: Arizona-Sonora Desert Museum.

Attitudes as Predictors of Native Plants in Yards

Attitude toward native plant species does not significantly predict proportion of native plant species in front yard landscaping. Reject H1.
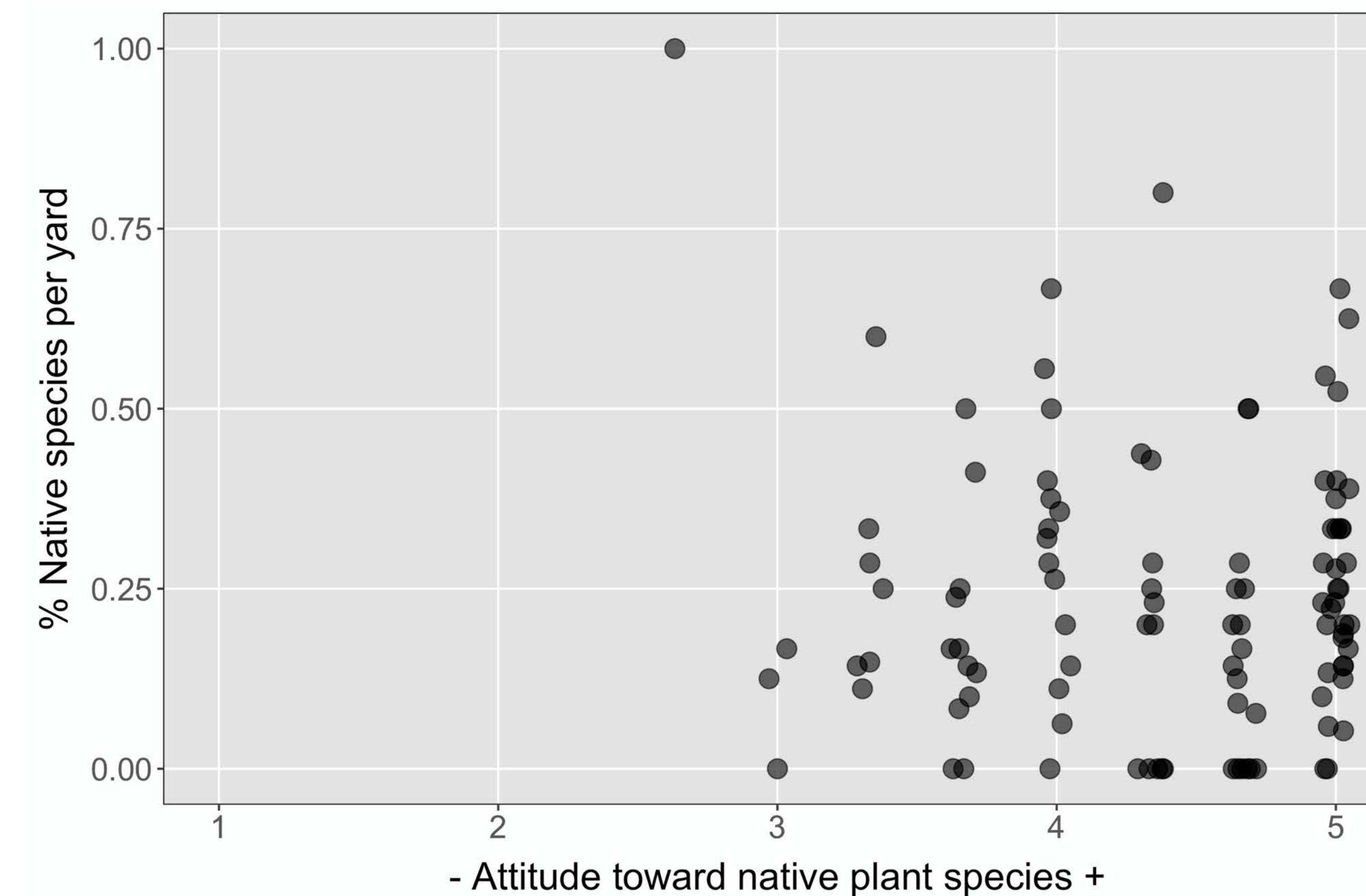

Figure 3. Percentage of plant species found in front yard landscaping that are native to the Sonoran Desert by indexed attitude toward native plants, with 1 being a very negative attitude and 5 being a very positive attitude.

Attitude toward the desert does not significantly predict proportion of native plant species in front yard landscaping. Reject H2.
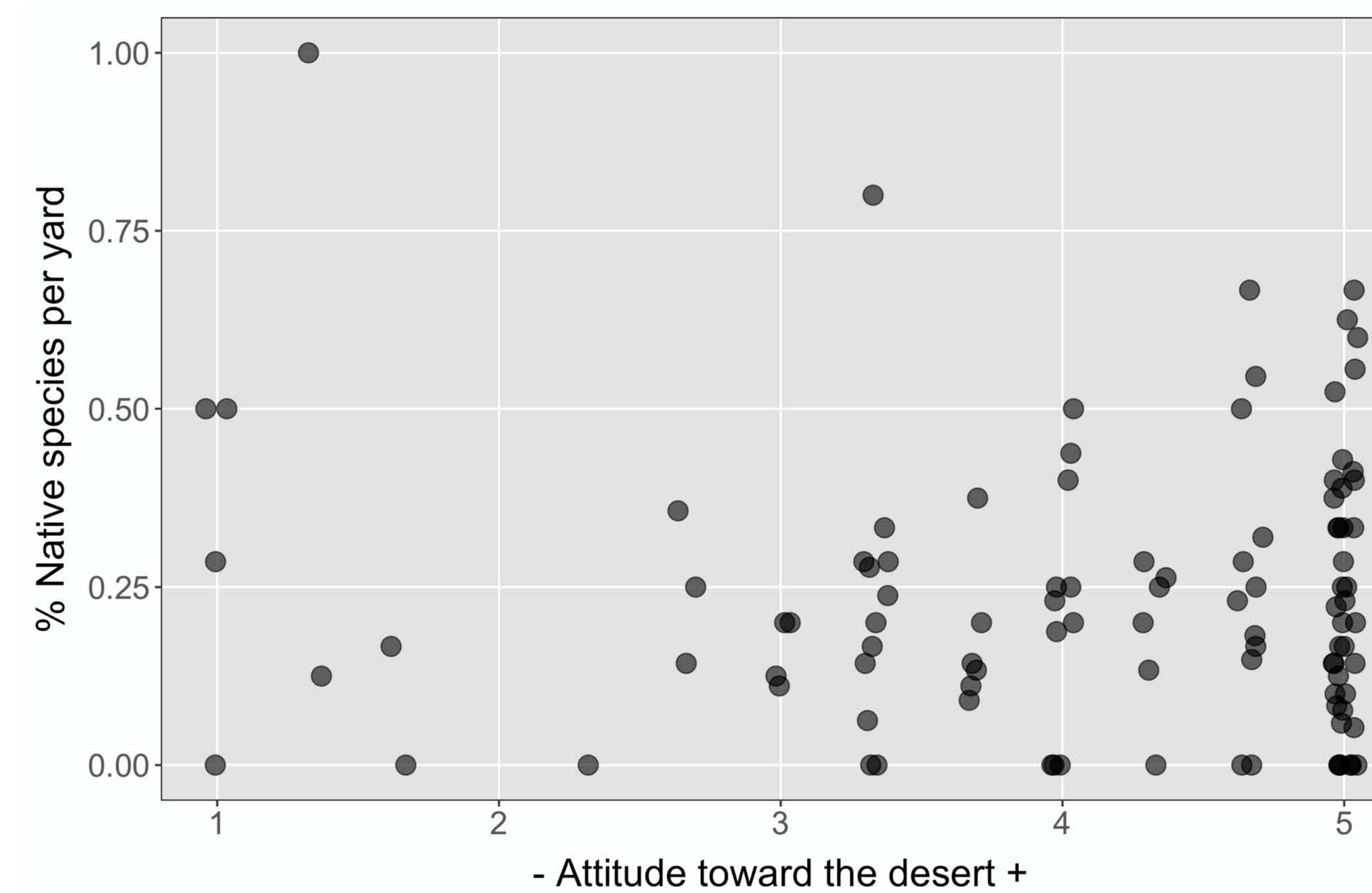

Figure 4. Percentage of plant species found in front yard landscaping that are native to the Sonoran Desert by indexed attitude toward the desert, with 1 being a very negative attitude and 5 being a very positive attitude.

Linear Model Results

Predictor	Estimate	Standard Error	P-value
Attitude toward native plants	-0.005	0.03	0.88
Attitude toward the desert	-0.01	0.02	0.50
Landscape style: Oasis	0.05	0.06	0.38
Landscape style: Xeric	0.16	0.04	0.0002

Table 1. Linear model of proportion of native plant species in front yards by resident attitudes and landscaping style. Landscape style had three levels: mesic (base), oasis, and xeric. R^2 = 0.1129.

Landscape Style as Predictor of Native Plants in Yards

Yards that had desert-style landscaping (xeric) were found to have a significantly higher percentage of native plant species than did mesic-style yards. Support H3.
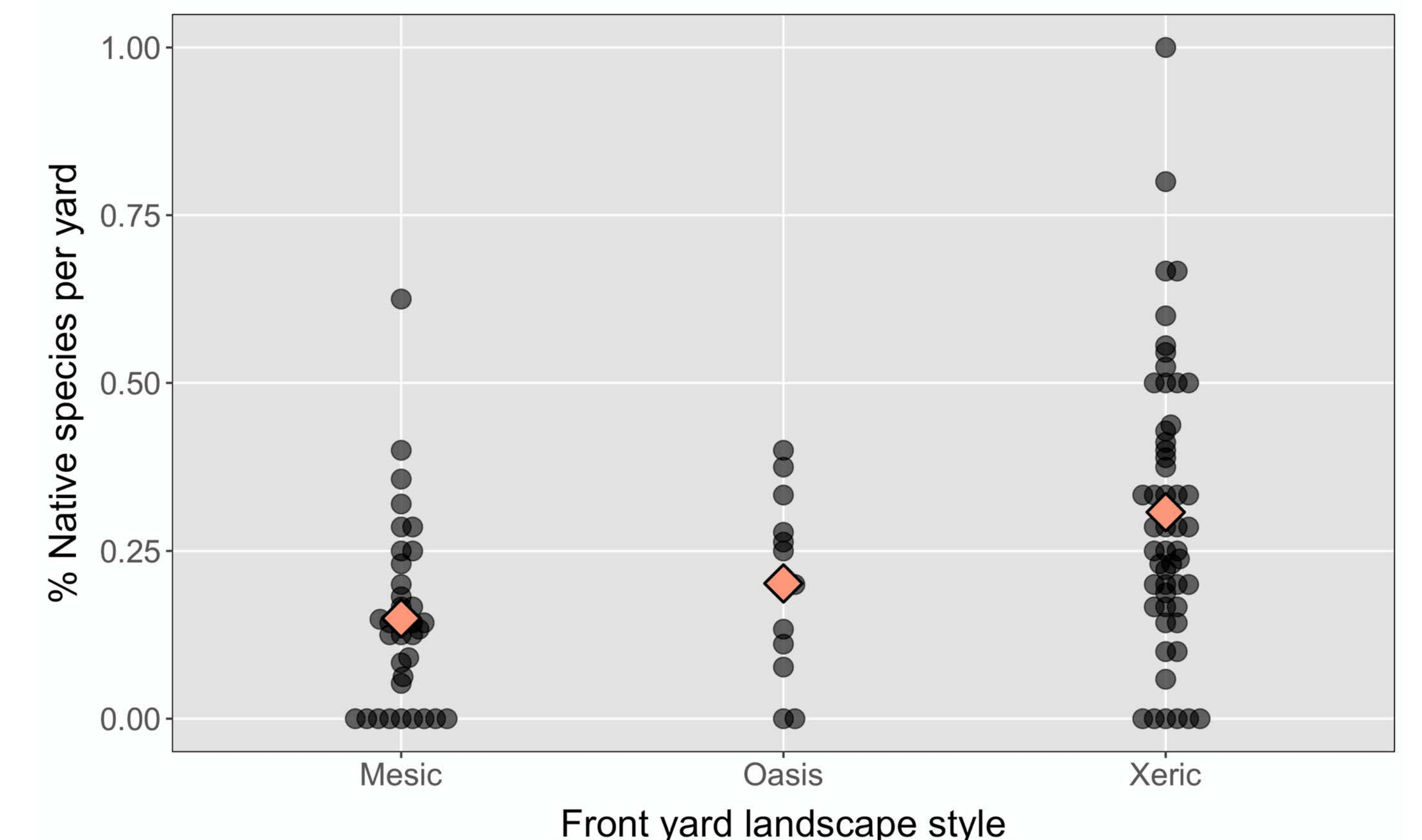

Figure 5. Percentage of plant species found in front yard landscaping that are native to the Sonoran Desert by yard landscape style. Diamonds represent averages for each group.

Mesic: Lawn-dominated landscape style

Oasis: Mixture of lawn and desert-style landscape

Xeric: Desert-style landscape

Conclusions

• **Attitudes toward the desert and native plant species do not predict abundance of native plant species in front yards.**
Resident attitudes toward the desert and native plant species are unlikely to drive native plant incorporation in urban landscapes. Other factors may have a more significant sway over landscaping choices such as resident demographic characteristics, resident knowledge about native plants, and native plant availability.

• **Landscape style can be an important predictor for abundance of native plant species in front yards.**
While desert-style landscapes may not replicate many functions of native desert, they do support a higher proportion of native plant species than do lawn-dominated landscapes.

• **Promoting positive attitudes toward native plants is unlikely to increase native plant use in landscaping, but increased xeriscaping may.**
This finding could help guide approaches to increasing and supporting native biodiversity in urban ecosystems.

References

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