

# Spatial Relationship Between Trees and Wildlife in Tarrant County

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#### **Abstract**

As urbanization continues to fragment landscapes, wildlife become more isolated and find it harder to access the necessary resources to survive. Finding ways to connect fragmented landscapes is necessary for wildlife, but it is important to know what areas wildlife currently occupy. Trees provide valuable habitat for many species, but it is important to know what tree species are the most overlap with both bobcats and coyotes. The areas with high densities of cedar elms are the best for coyotes and bobcats, which is an indicator that they will be good for other species. Therefore these areas should be targeted for conservation and restoration.

#### Background

As the Dallas-Fort Worth Metroplex grows, natural landcover is turned into urban development which reduces the resources and habitat available for wildlife. Trees are essential for wildlife because the provide cover and allow wildlife to move through the urban matrix. Bobcats and coyotes are predators that can serve as indicators for quality of an ecosystem, especially in an urban area because these two species occupy the top of the food chain. Different species of trees offer varying resources that are better suited for some species, so it is important to understand what tree species are the best for bobcats and coyotes.

## **Objective**

To find the overlap of high bobcat and coyote density areas with different tree species, and identify which tree species has a the highest density in areas with bobcats and coyotes.

#### Methods

- . The study area was Tarrant County, TX (Fig 1).
- All point locations were obtained from iNaturalist which is a citizen science source. The data used was from 2020 to 2023 and included the following tree species: cedar elm, American elm, Texas ash, common hackberry, and bur oak.
- ArcGIS Pro was used to calculate the kernel density of each tree species and also for bobcats and



Figure 1. Study area includes all of Tarrant County

- coyotes (Fig. 2). This output a raster layer for each point layer.
- A rivers and streams layer was added to show the relationship with water and the density of all of the species.

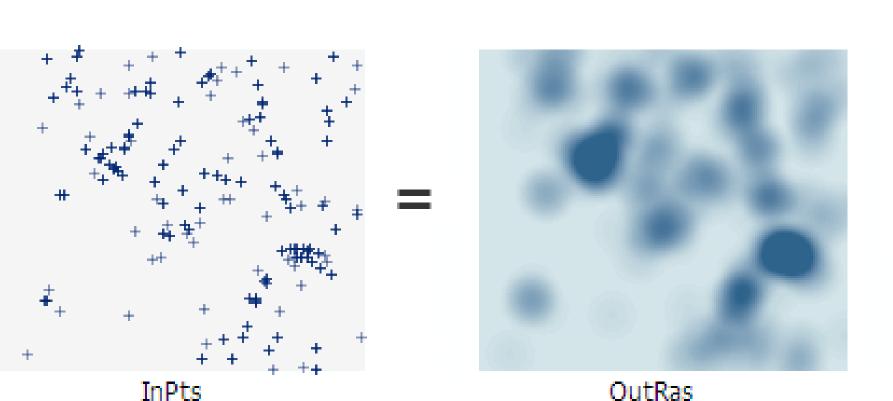


Figure 2. Illustration of kernel density output from point inputs

#### Results

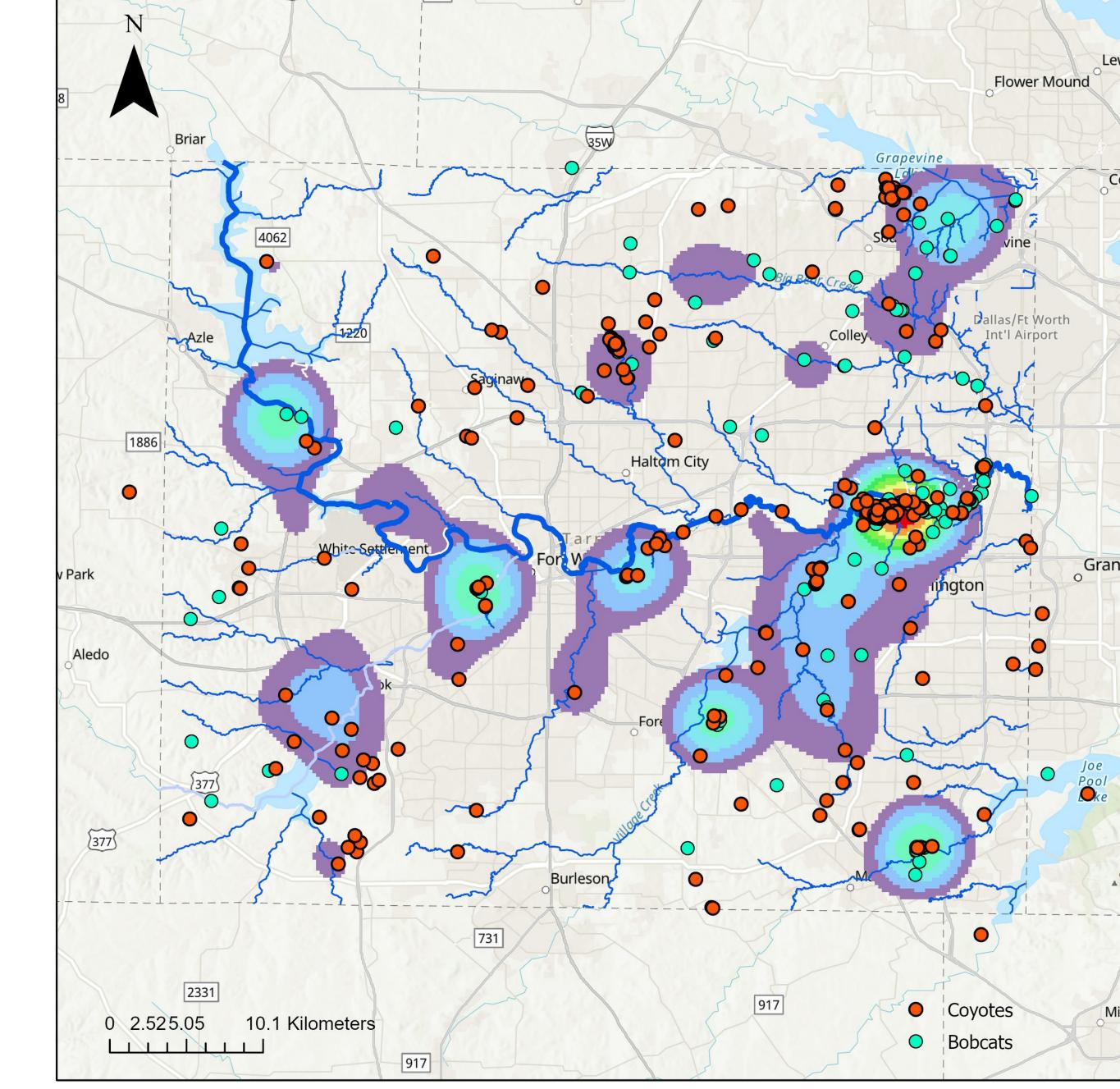


Figure 3. Cedar Elm density and locations of coyotes and bobcats

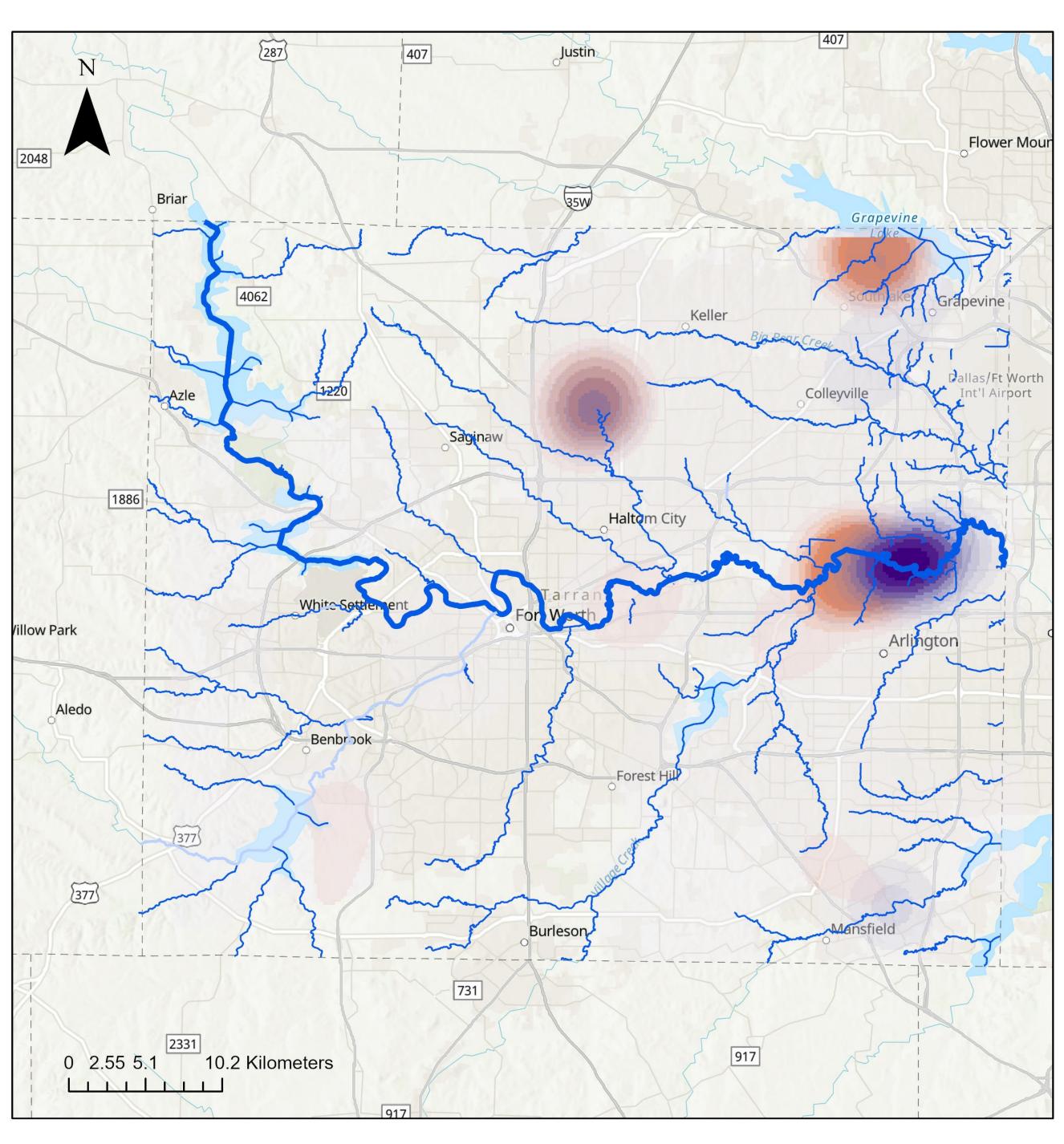
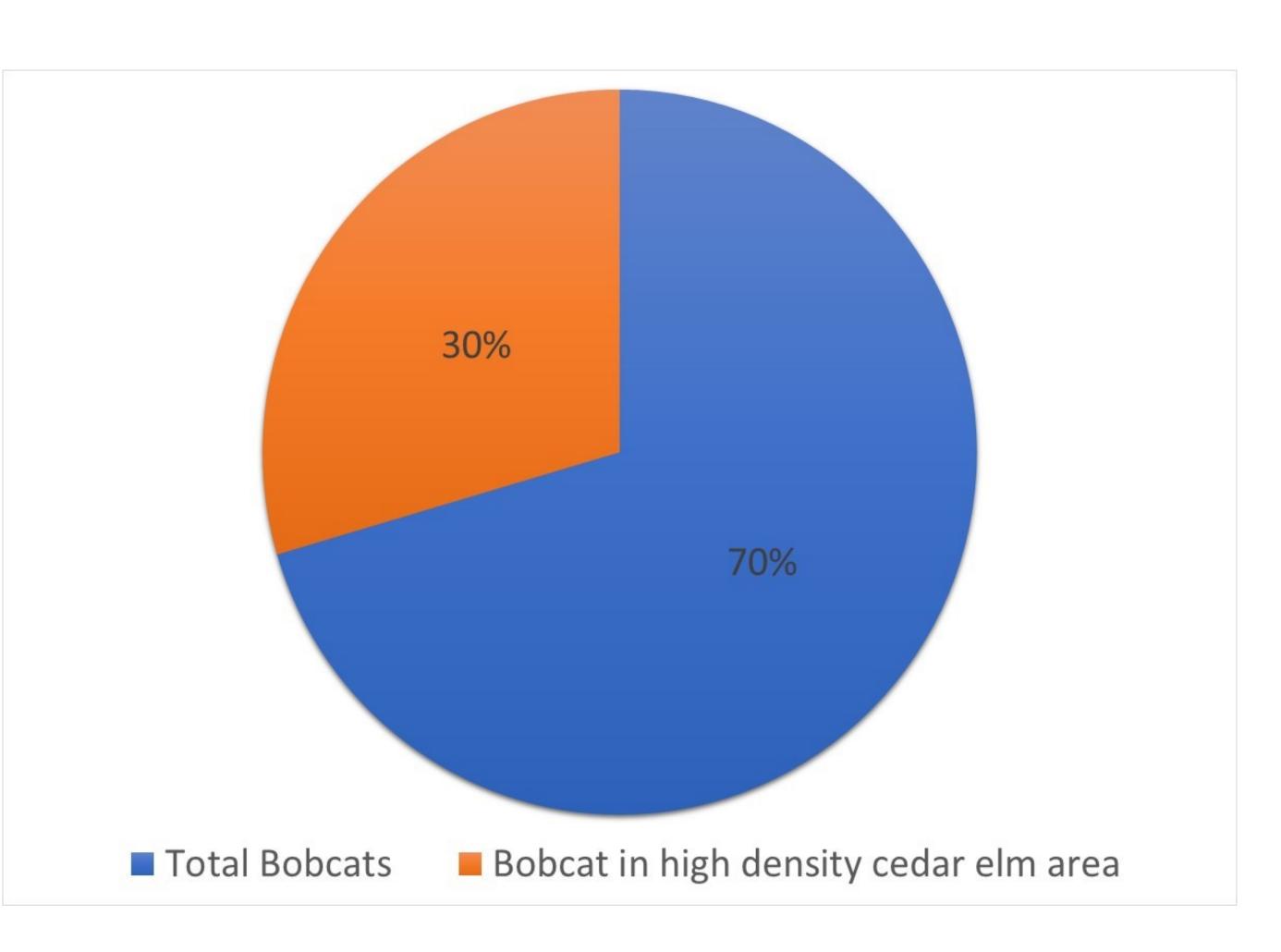


Figure 4. Density of coyotes and bobcats. Orange is coyotes and purple are bobcats.

### Result

- The maps show that there is a strong relationship between cedar elm and both coyotes and bobcats (Fig 1). The other tree species did not have a strong relationship with bobcats and coyotes, although American elm did have high densities along the West Fork of the Trinity river, but less than cedar elm.
- · Cedar elm densities had a strong relationship with the Trinity river and streams throughout Tarrant County (Fig. 3).
- The densities of bobcats and coyotes are both concentrated in the same area around the West Fork of the Trinity river which includes parts of Arlington and Euless because this area has a high density of trees and riparian habitat (Fig 2.).
- What we found was that 23% of coyote sightings occurred in the high density cedar elm area (Fig. 5).
- 30% of bobcat sightings occurred the high density cedar elm area (Fig. 6).



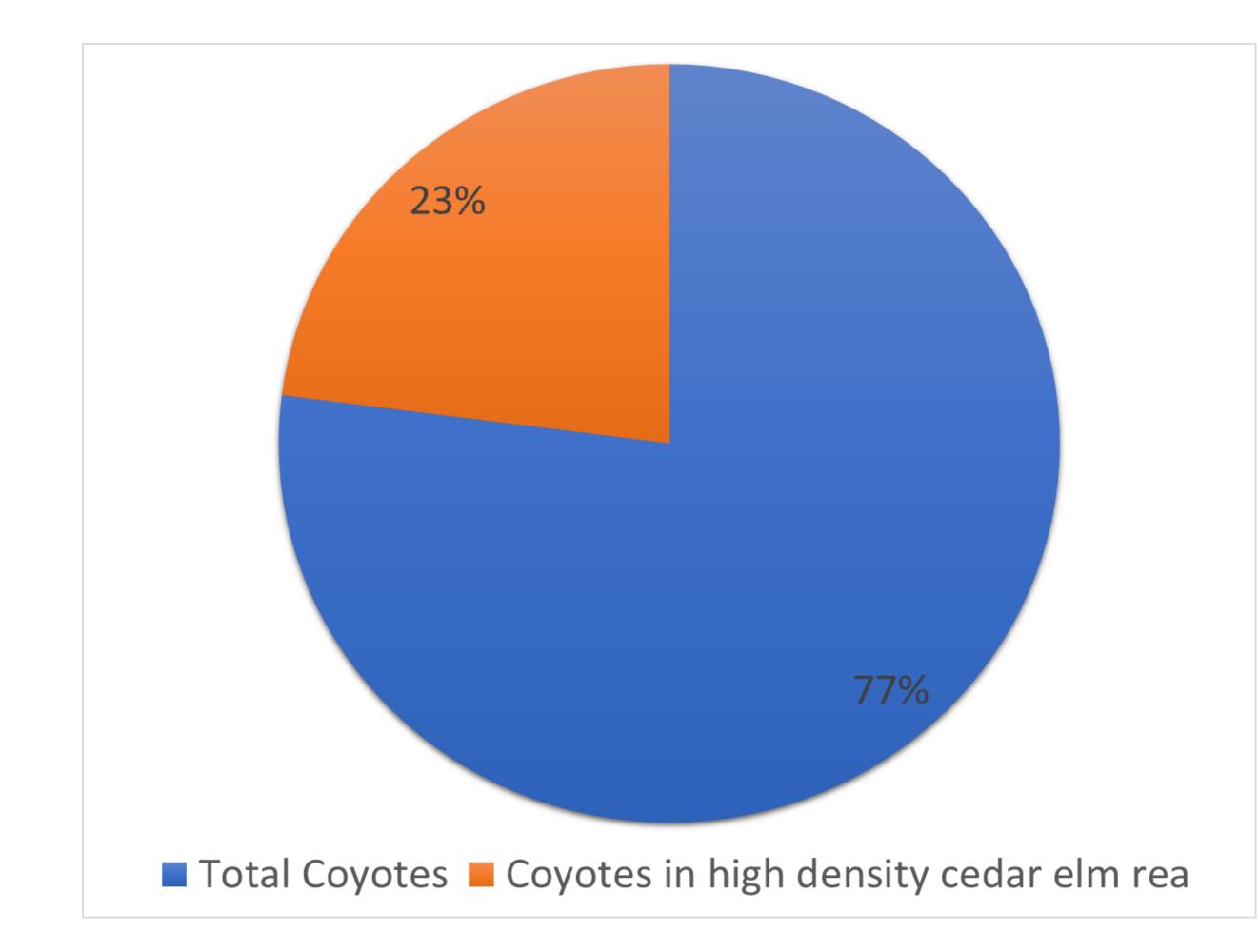


Figure 5. Percent of bobcats in the area with highest cedar elm density

**Figure 6.** Percent of coyotes in the area with highest cedar elm density

### Conclusion

- Coyotes and bobcats are both concentrated in areas with high cedar elm density meaning that this tree species provides the best quality habitat for these two species.
- Cedar elm occurs mostly along rivers and streams, so these riparian habitats are great for wildlife, and protecting these areas is needed.
  Restoration of riparian habitats should be focused on planting cedar elm trees so that these habitats will be the most suitable for wildlife.