



# The Distribution of Bird Species Diversity in the Phoenix Metro Area Visualizing the Spatial Patterns of Diversity in an Expanding Urban Matrix

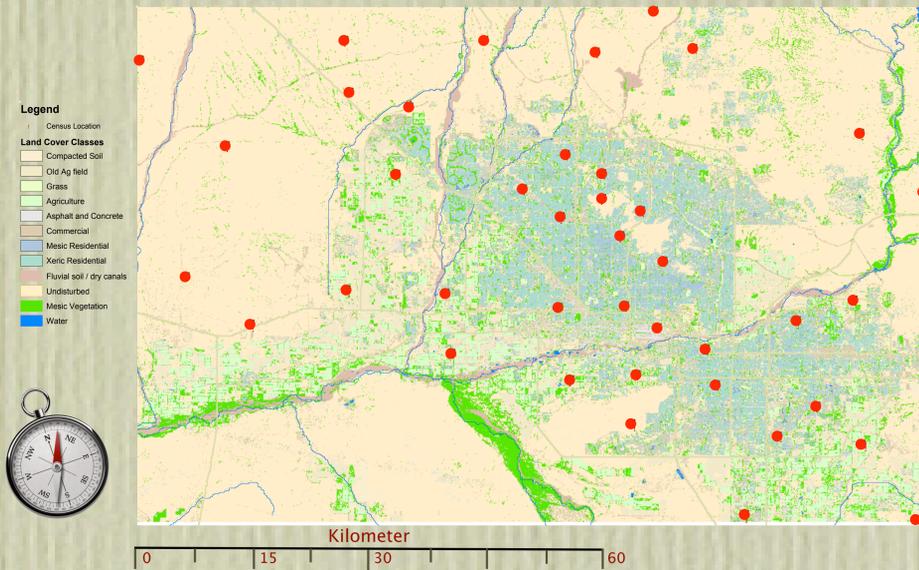
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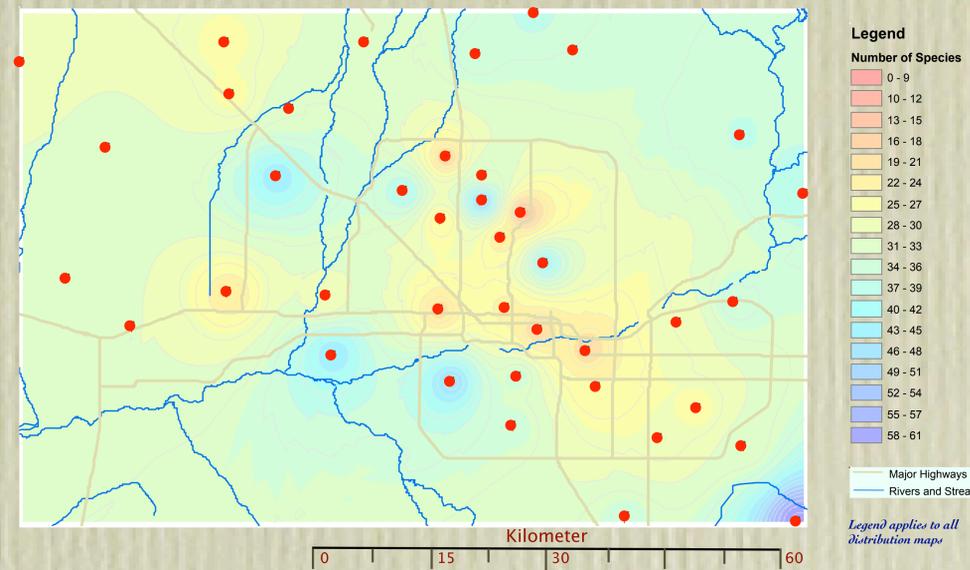
Birds are among the most conspicuous wild animals in urban areas, and serve as useful indicators of biological diversity. Information on the diversity and distribution of birds can therefore not only inform our understanding of how cities affect other species, but also help urban planners in guiding future development in ways that can maintain and enhance urban biodiversity. The bird-monitoring project in CAP LTER has conducted regular censuses since October 2000 to quantify the distribution and abundance of all bird species occurring throughout the Phoenix metro area. We monitor birds four times a year, at 51 sites in four major land-use categories: urban (18 sites), desert (15), riparian (11), and agricultural (7).

During the first two years of monitoring, we recorded 165 species in the area. Overall, riparian sites had the most species (148) followed by agriculture (89), desert (81), and urban (77). We have previously studied the relationships between species diversity and habitat and socio-economic characteristics. Here we explore the spatial patterns of bird species distribution across the entire landscape matrix, using mapping tools from ArcGIS

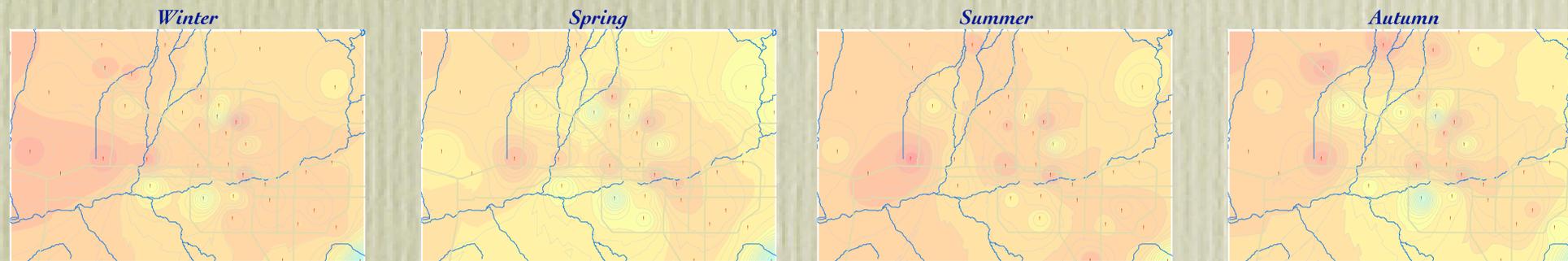
Land Cover Map of the Phoenix Metro Area



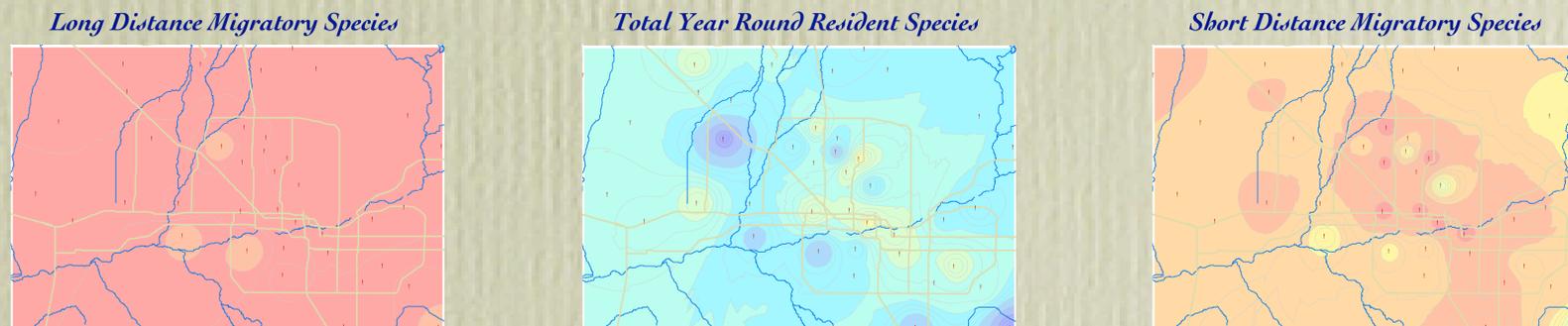
Distribution of Total Bird Species Diversity



Seasonal Variation in the Distribution of Diversity



Distribution of Residency and Migratory Tendency Among the Phoenix Avifauna



These exploratory maps help visualize the distribution of bird diversity in terms of seasonality, land-use, and the status of birds: e.g., resident, migratory, native, or invasive.

Examples presented here show:

1. Native habitat embedded within the urban matrix continue to support higher bird diversity.
2. The extant diversity of habitats and land uses enhances the overall bird diversity of the Phoenix metro area.
3. There is considerable seasonal variation in the distribution of bird diversity across the landscape - with more species seen in Spring and Autumn.
4. The majority of species are resident in the area all year round, with fewer migrant.

These maps are being developed as part of a website that will allow scientists, citizens, and urban planners to explore these relationships visually and interactively. Such visualization tools can help disseminate the results of our long-term monitoring among a wider audience of citizens and decision-makers that will shape the future development of Phoenix and other metropolitan areas.

