

Investigating Factors that Influence Bird Abundance and Distribution at Mundy's Landing

Abstract

Mundy's Landing is private property alongside the Kentucky River that borders Woodford and Mercer Counties in Kentucky. The site's variety of habitat types, including open pasture and forested areas, as well as access to a large water source benefit many different bird species. The objective of this study is to determine the environmental factors drive species richness, abundance, and distribution of birds at Mundy's Landing. A series of point count surveys were performed throughout the property to determine which bird species were present in habitat types including forested, open pasture, and riparian areas. The factors found to drive species richness, abundance, and distribution across the site were habitat cover and type, as well as the presence of a water source. This is due to variety in species niches as different habitat types suit different species, impacting where they are detected. Of the 34 species detected at our site, 76% are associated with forested areas and 14% are associated with open pastures. Additionally, 24% are habitat specialists and are facing population declines, such as the Yellow-Billed Cuckoo.

Study Area

Mundy's Landing is private property alongside the Kentucky River that borders Woodford and Mercer Counties in Kentucky. The property supports a diverse range of species by offering habitats including open pasture, forested areas, cliff faces, abandoned mines, caves, and the Kentucky River. However, attributed to its location on the river, the property is prone to flooding. As a result of floods in the area, many wildlife habitat is at risk of being impacted.



Figure 2. Streamside woods at Mundy's Landing property. Kentucky River is to the right. Note excessive amounts of erosion and sand deposition attributed to the river.

Methods

Methods included point-count surveys in 10-minute increments. It was noted if birds were detected visually or vocally, as well as if they were in or out of a 50m range. NOCS Provision standard issue 8x25 binoculars were used for visual identification of birds. Habitat types were sampled based on a map of soil types in ArcGIS Pro, impacting vegetation type and habitat cover found.

Results

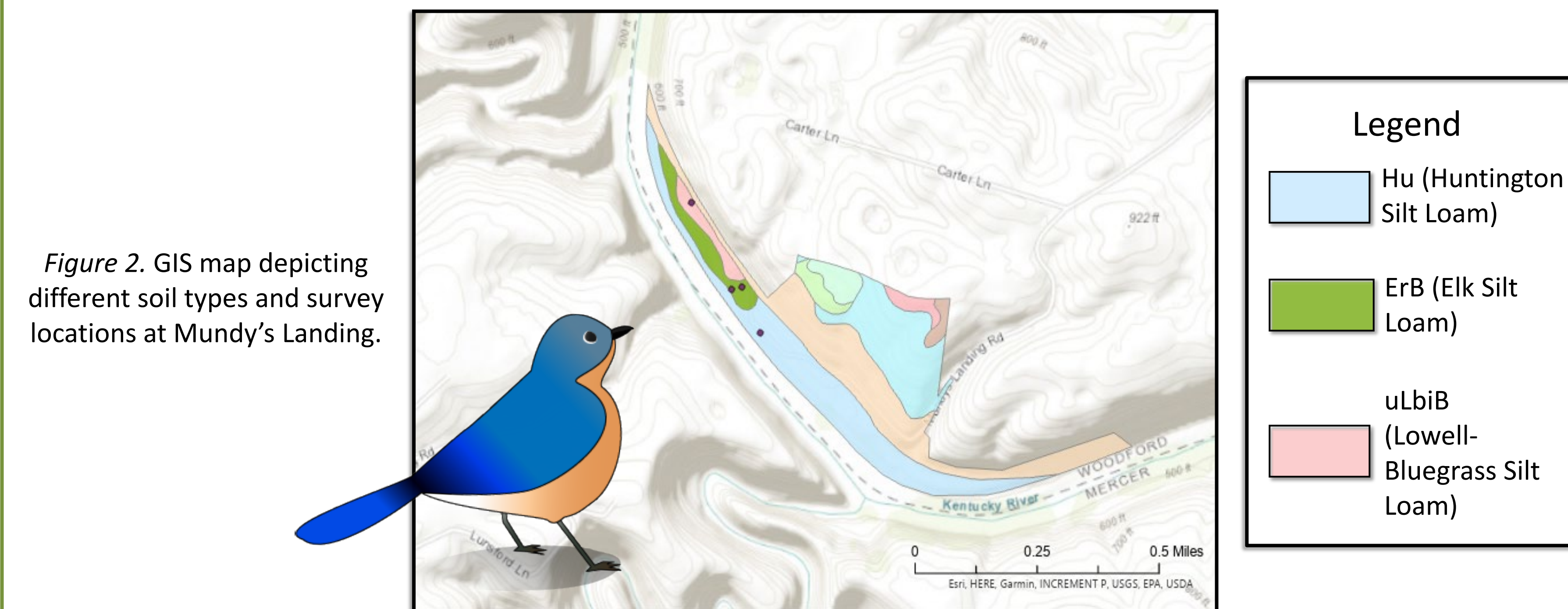


Figure 2. GIS map depicting different soil types and survey locations at Mundy's Landing.

IUCN Status of Birds Recorded at Mundy's

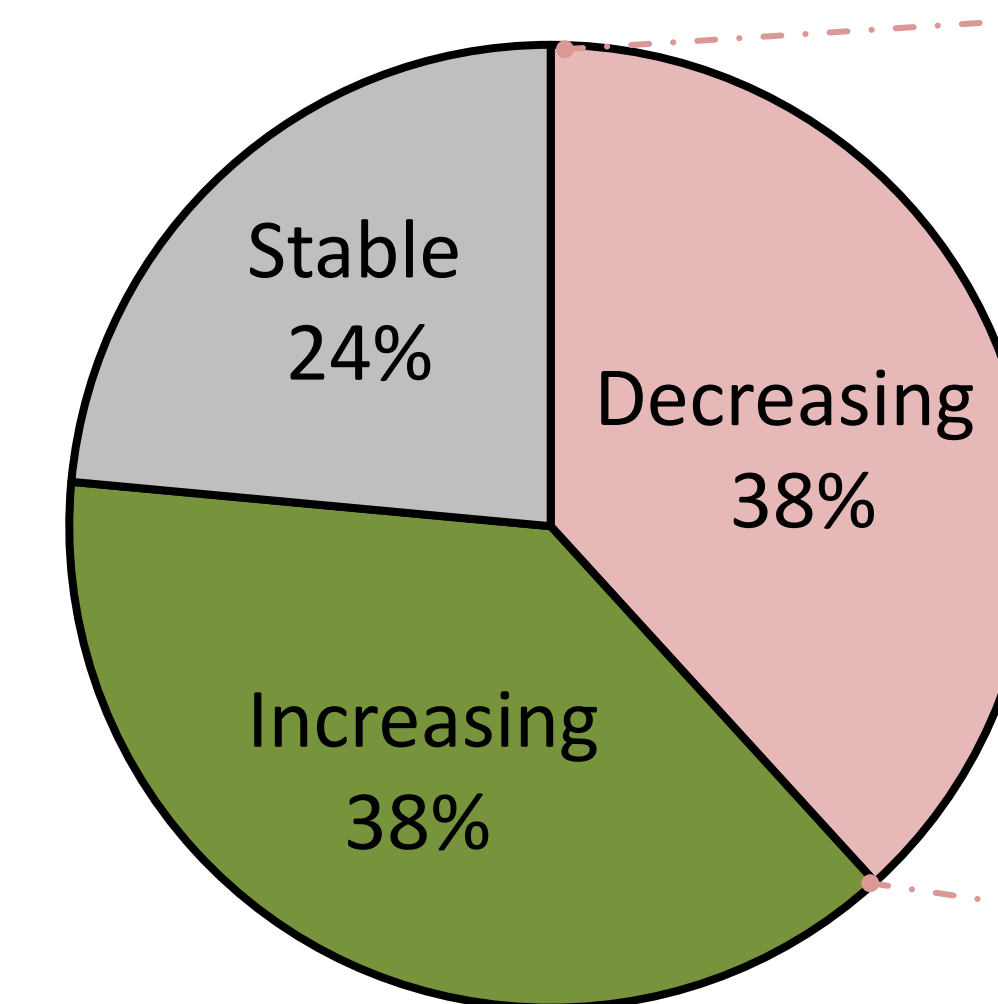


Figure 3. Chart of the IUCN Status for birds recorded at Mundy's. They were divided into increasing, decreasing, or stable populations. Equal proportions (38%) of species were increasing and decreasing, while only 24% were stable.

Decreasing Specialists and Generalists

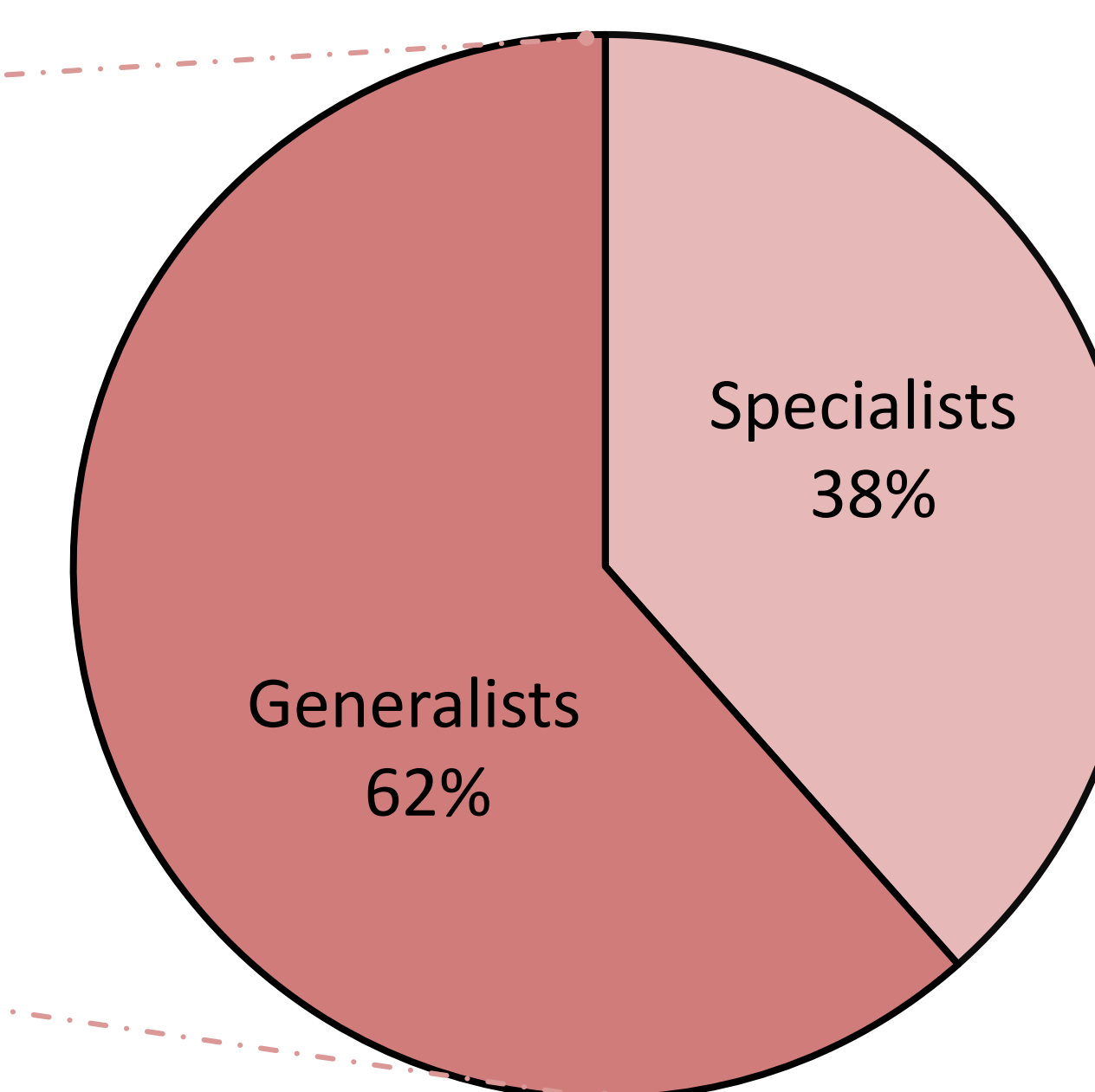


Figure 4. Chart depicting the number of decreasing generalist and specialist populations. Note that there were more generalist species decreasing as there were more generalists recorded at the site compared to specialists.

Associated Habitat for Birds Sampled

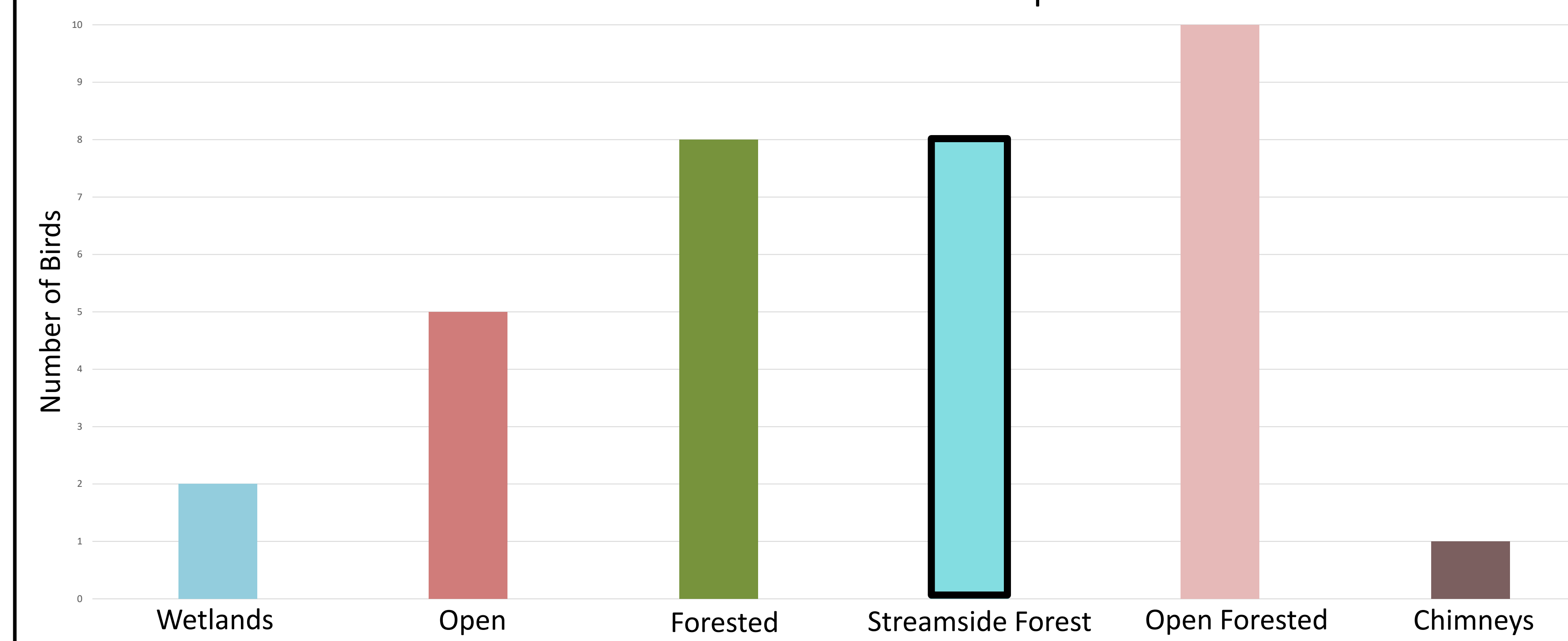
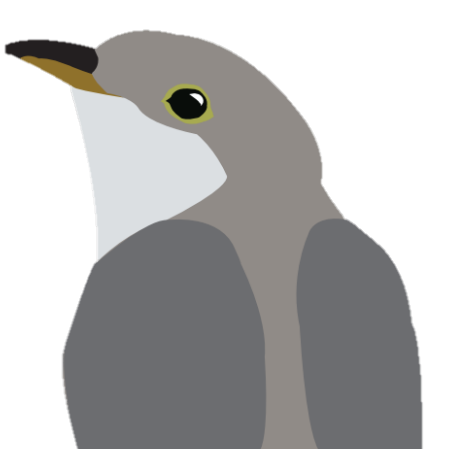


Figure 5. Chart of the number of birds and their associated habitat types. Approximately 76% of all bird species recorded are associated with a type of forested habitat including completely forested (24%) streamside forested (24%) and open forested (29%) areas. 14% of bird species recorded are associated with open habitat including pastures. 6% of the bird species are associated with wetlands, and 3% are associated with human structures such as chimneys. Streamside forests, outlined in black on the chart, was the habitat that had the most specialists associated with it.

Discussion

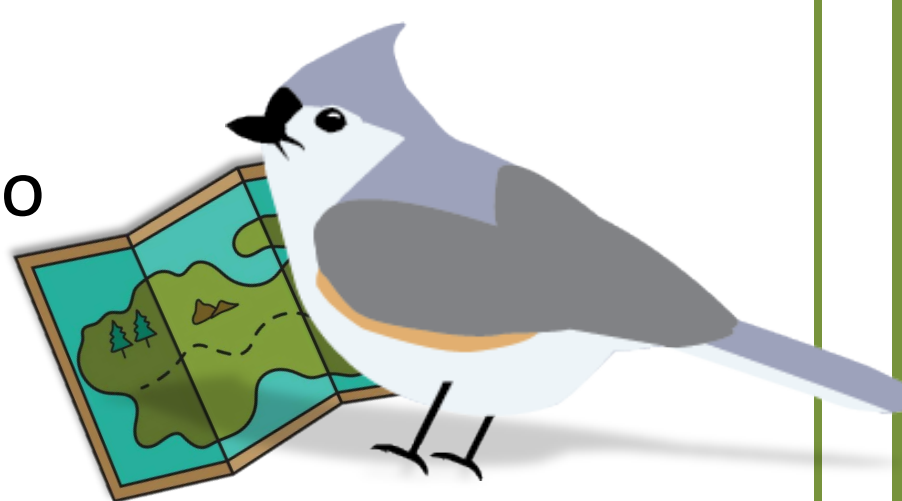
Of the 34 bird species sampled at Mundy's Landing, 24% of their populations are stable, 38% are increasing, and 38% are decreasing. Specialists (species with a narrow ecological niche, relying on specific resources or habitat to survive) encompass 24% of the recorded birds, and 76% are generalists (species that can survive with a variety of resources and habitat). Of only the specialists, 25% are of low conservation concern, while 75% are experiencing declining populations.

The Yellow-billed Cuckoo has been declining at an average rate of 1.6% per year. In North America, they declined by 7% over the past ten years. (IUCN)



This highlights the importance of preserving diverse and valuable habitat for these species, as Mundy's Landing offers habitat for a diverse range of bird species, many of whom are experiencing habitat loss and degradation, the two largest drivers of bird population decline (ABC-Birds). The habitat found to contain the most specialists on the site is streamside forests, which could be vulnerable to flooding that could impact habitat quality. It's important that we prioritize the conservation of these habitats to prevent possible ecosystem collapse due to the loss of these specialists who offer ecosystem services such as pollination, seed dispersal, nutrient cycling, scavenging, and more.

Future work could use Lidar and GIS mapping to monitor habitat sites, as well as determining risks of these habitats being impacted by future flooding.



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