

Density of Northern Parula (*Parula americana*) Along the Current River as Compared to Peck Ranch Conservation Area

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Introduction

Northern Parula (*Parula americana*) are a neotropical migrant species of warbler that breed in the eastern United States. This species has two different habitat types in which it chooses to breed in, along rivers and in forests. Within these two chosen habitats the density of Northern Parula may vary depending on the available resources. It is important to understand the relationship between the chosen habitat type and density in order to guide management decisions.

Methods

The two habitats I selected were the un-harvested forest in Peck Ranch Conservation Area owned by the MDC and the Current River from Powder Mill to Robert's Field in the Ozark National Scenic Riverways owned by the National Park Service. I documented calls along the Current River by canoeing down the river and marking GPS waypoints for each observation. I traveled down the river on 3 occasions, then compiled the observations to determine territory locations. I determined the area in m² that was traveled along the river and used an area of equal size in the un-harvested forested site. In the un-harvested forest, Northern Parula calls were documented by the Missouri Ozark Forest Ecosystem Project (MOFEP) bird group. The MOFEP group spot-mapped calls within different subplots on the un-harvested site 9 times and I selected 3 of the 9 spot-map occasions for my study. I compiled the observations on the maps to determine territory locations. Next, I determined the distance from each territory to the nearest neighboring territory. Then, I compared the average distance to nearest neighbor for the un-harvested site and the river sites. The site with more suitable habitat for Northern Parula would be expected to have the lowest average distance to nearest neighbor.

Results

I located a total of 54 individual Northern Parula; 25 along the Current River and 29 within the un-harvested site of Peck Ranch Conservation Area. The mean distance to nearest neighbor for Northern Parula along the Current River was 179.2 m ± 14.9 SE with distances ranging from 58.0 m to 338.0 m (Fig. 1). The mean distance to nearest neighbor on the forest site was 199.3 m ± 11.6 SE with a range of 117.5 m to 347.6 m (Fig 2). The means for the un-harvested site and the river were not significantly different ($t=1.08$, $df=52$, $p=0.14$) (Fig. 3).

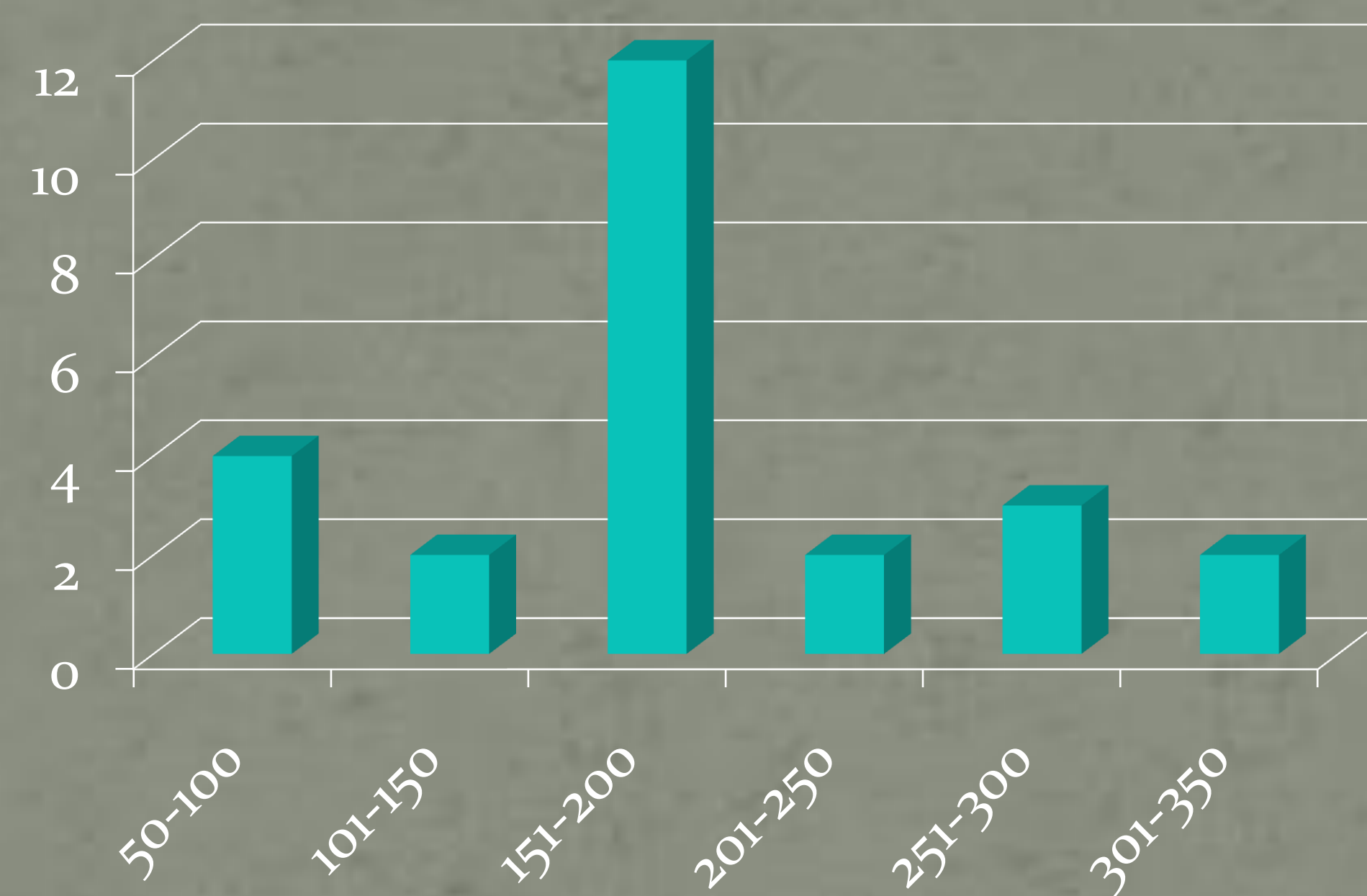


Figure 1: Distance to nearest neighbor for Current River

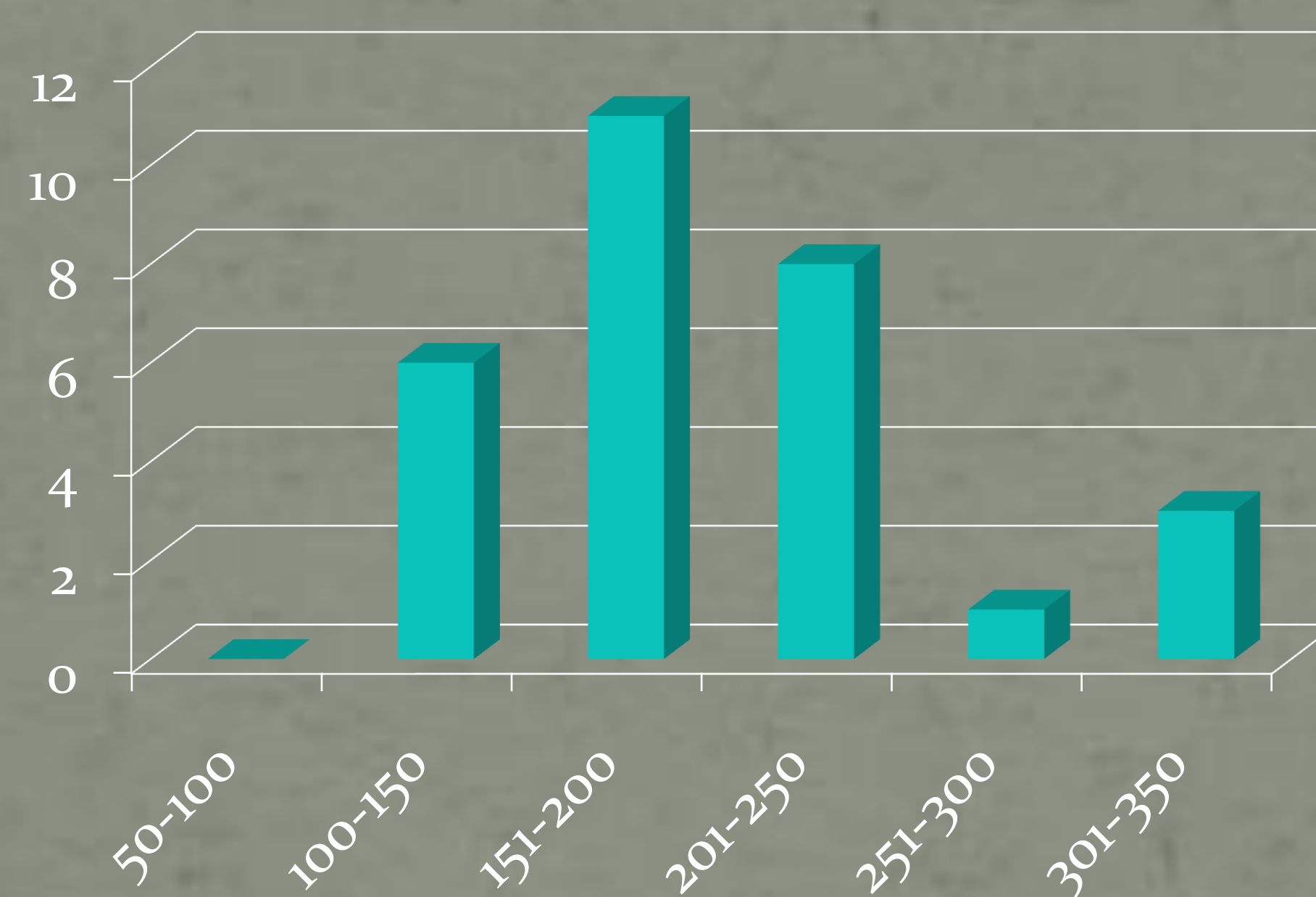


Figure 2: Distance to nearest neighbor for un-harvested forest

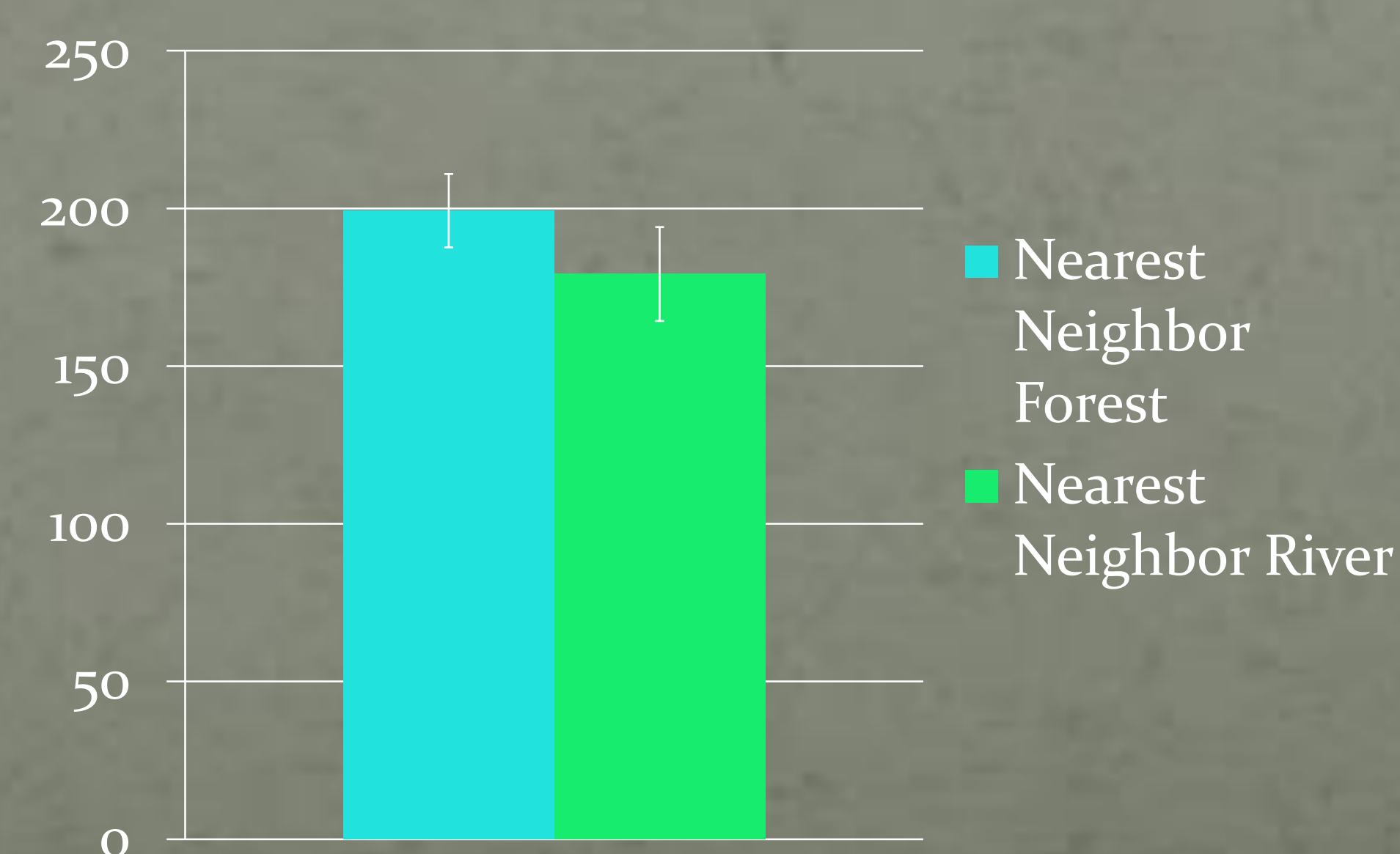
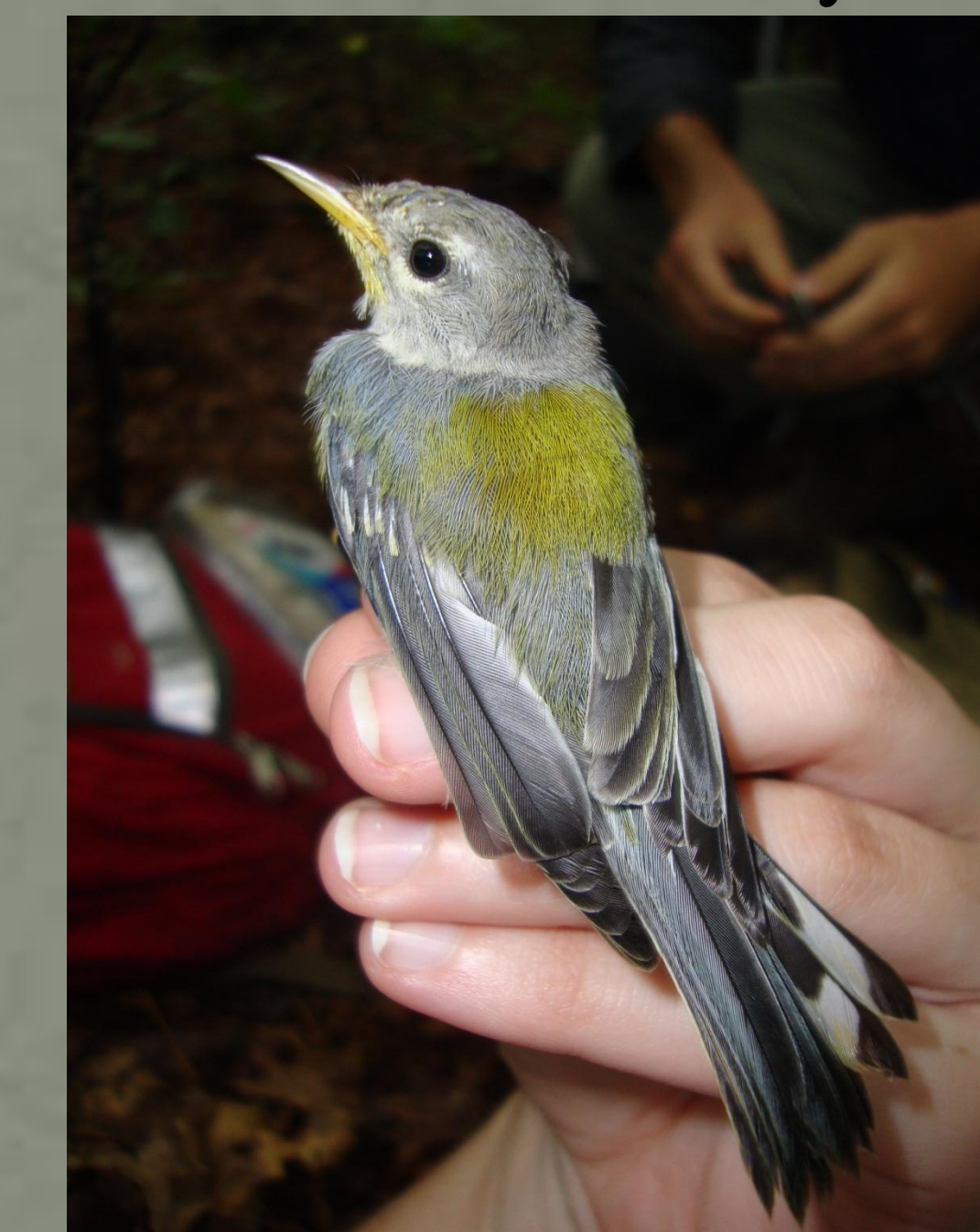
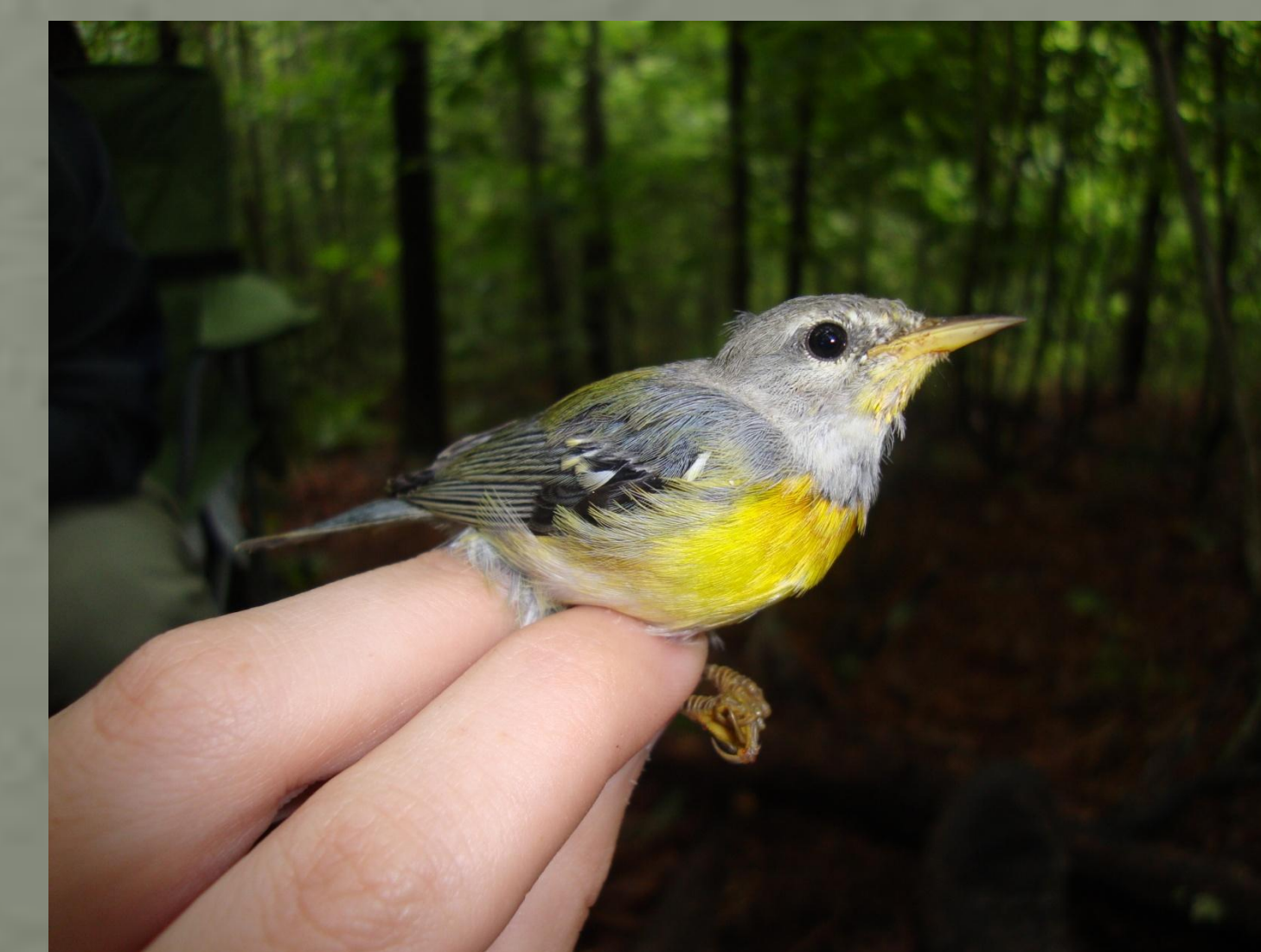


Figure 3: Average nearest neighbor distance and standard error.

Discussion

The Current River study site had a lower average distance to nearest neighbor than did the un-harvested forest site. The lower the average for distance to nearest neighbor the closer together the Northern Parula are situating themselves. This smaller distance could be due to an increased amount of suitable habitat around the river. It is most probable that the water from the river allows more lush species of plants to survive and therefore provides Northern Parula with more insects for food, cover, and nesting material. Although there is a trend of higher density along the river, there was not a significant difference between the two sites due to variances. Even though both of the sites had the same area in m² the Northern Parulas along the river site showed signs of clustering. During my trips I noticed that most of this clustering occurred where there were islands in the middle of the river. This preference is most likely due to a lack of predators on the islands. To further this study, a larger sample size could be used in order to decrease the variance size and get a more accurate idea of the densities. GPS waypoints were not taken for the Northern Parula located in the un-harvested forest which may have caused slight variations in where they were located on the map. In future studies I believe GPS waypoints should be taken for both sites to lessen human error in the data analysis.



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