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# Behavioral Observations: Foraging and Aggression of Neotropical Migrants and Resident Birds in Panama

Jessica M. Johnston

*Virginia Commonwealth University*, johnstonjm2@vcu.edu

Samuel B. King

*Virginia Commonwealth University*, kingsb3@vcu.edu

Ryan A. Levering

*Virginia Commonwealth University*, leveringra@vcu.edu

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# Behavioral Observations: Foraging and Aggression of Neotropical Migrants and Resident Birds in Panama

Jessica M. Johnston, Samuel B. King & Ryan A. Levering  
Virginia Commonwealth University, Department of Biology and Center for Environmental Studies



## Introduction



- Lyons suggests that foraging data in songbirds can be an indicator of food abundance, with higher attack rate = higher habitat quality; higher foraging speed = lower habitat quality (2005)
- Territorial behavior such as interspecific aggression among songbirds may also be related to food availability. Previous studies have documented variation in the extent of territorial and aggressive behaviors among resident and Neotropical migratory species on tropical wintering grounds.

## Objectives

- Gather foraging and aggression data at two coastal mangrove sites in central Panama, one on the Caribbean Coast (Galeta) and one on the Pacific Coast (Juan Diaz-East)
- Use foraging data as an indicator of habitat quality and food availability
- Perform aggression trials in order to compare territorial behaviors among resident Mangrove Warblers (YWAR) and two Neotropical migrant species, the Prothonotary Warbler (PROW), and the Northern Waterthrush (NOWA).
- Determine whether or not territorial behavior is shown and if habitat quality plays a role in these behaviors

## Methods

- Random focal observations were performed to observe feeding behaviors of YWAR, PROW, and NOWA, measuring all movements, maneuvers, and non-foraging movements.
- Foraging speed was calculated by examining the number of movements per minute; attack rate was calculated by examining the number of maneuvers per minute.
- Random focal observations were done to examine territorial behaviors of Neotropical birds, developing a numerical score of 1 to 4 to describe an individual's aggressive response to playback and decoy trials.
- A second aggression score (Score B) was developed to incorporate flocking behaviors into the original overall score.

## Aggression

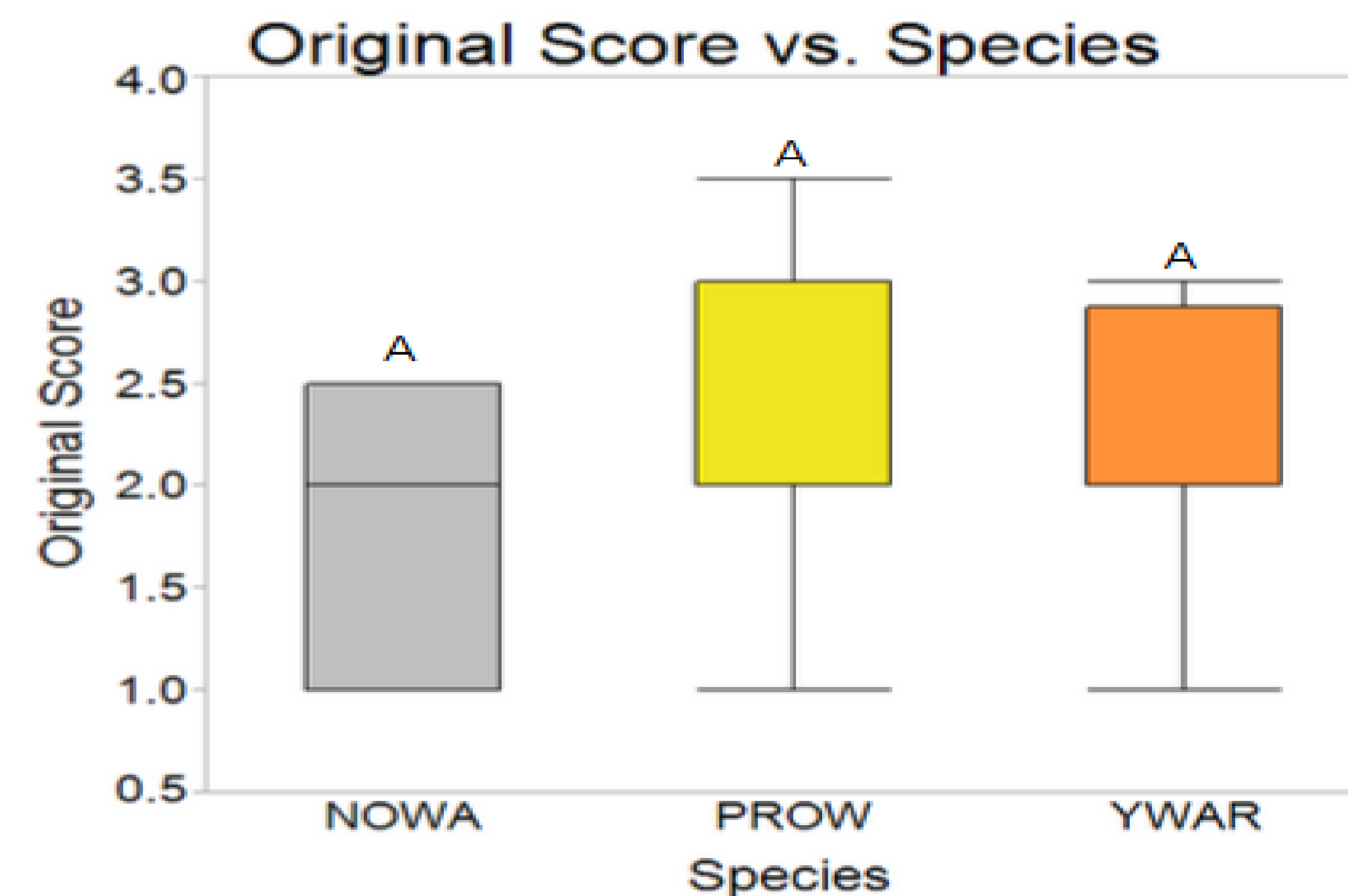


Figure 1. ANOVA comparing Original Scoring System by species (p-value=0.50)

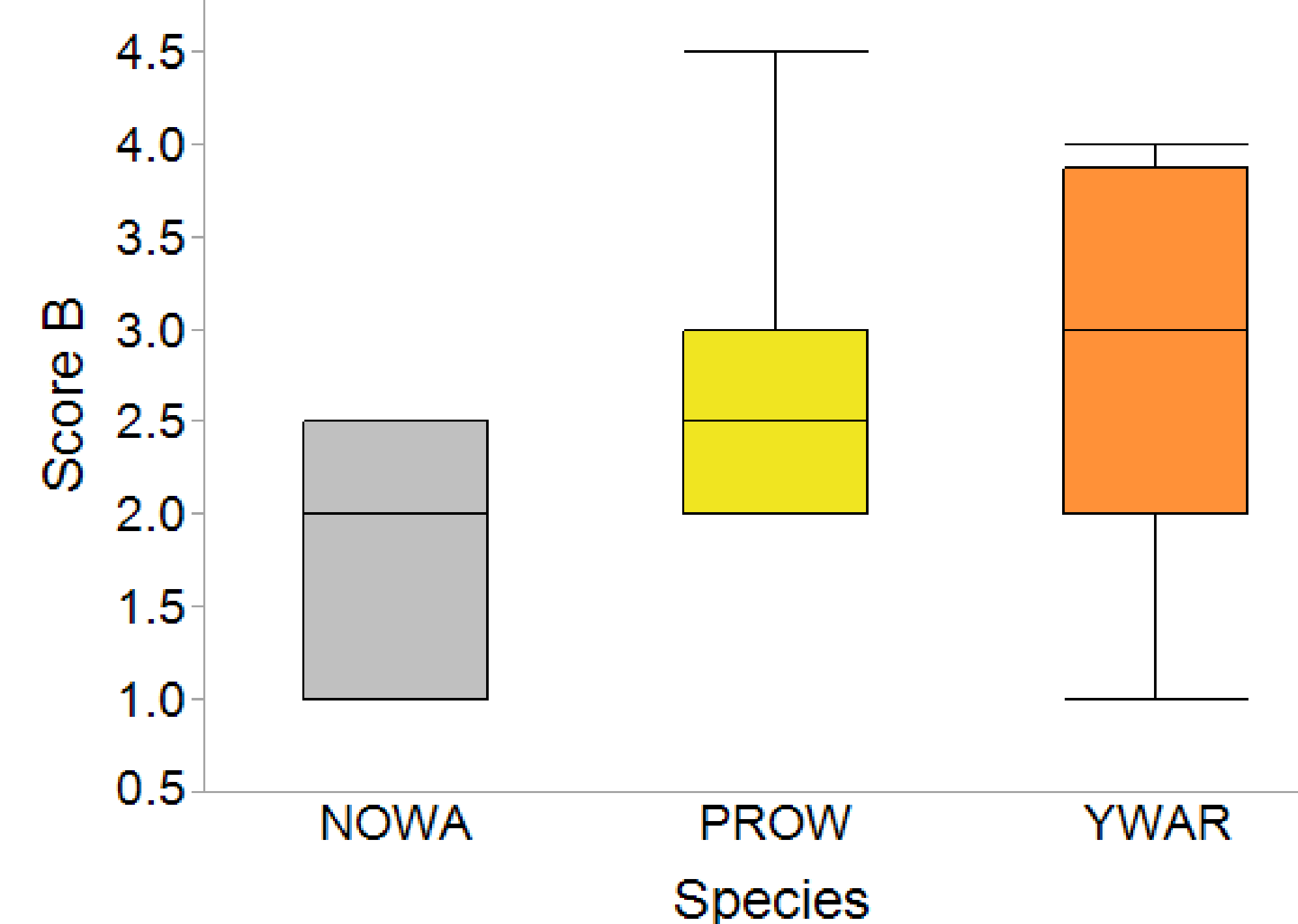


Figure 2. ANOVA comparing Score B (Overall Aggression Score + Flock Score) by species (p-value= 0.04)

## Conclusions

- Although the attack rate did not vary between sites, the Prothonotary Warbler displayed a higher foraging speed at the Pacific site, which may suggest lower habitat quality.
- Unlike previous studies, our results indicate YWAR, PROW, and NOWA display similar behaviors, including flocking, but more research is required to examine if flocking behaviors are in fact aggressive responses indicative of territorial behavior.
- Refinement and standardization of methods for aggression trials will enhance research going forward.

## Foraging

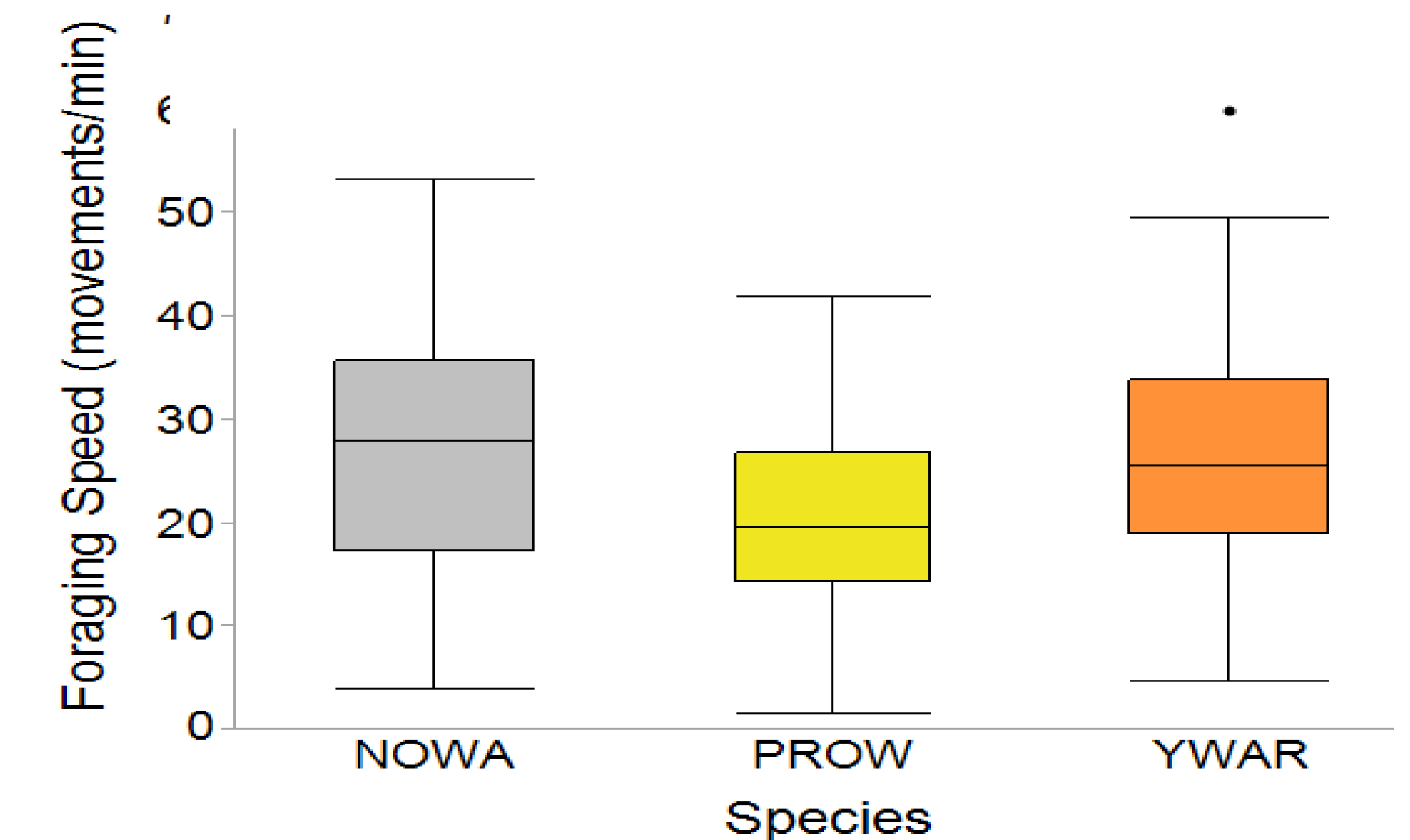


Figure 3. Foraging Speed (movements/minute) across both sites. (p-value= 0.09)

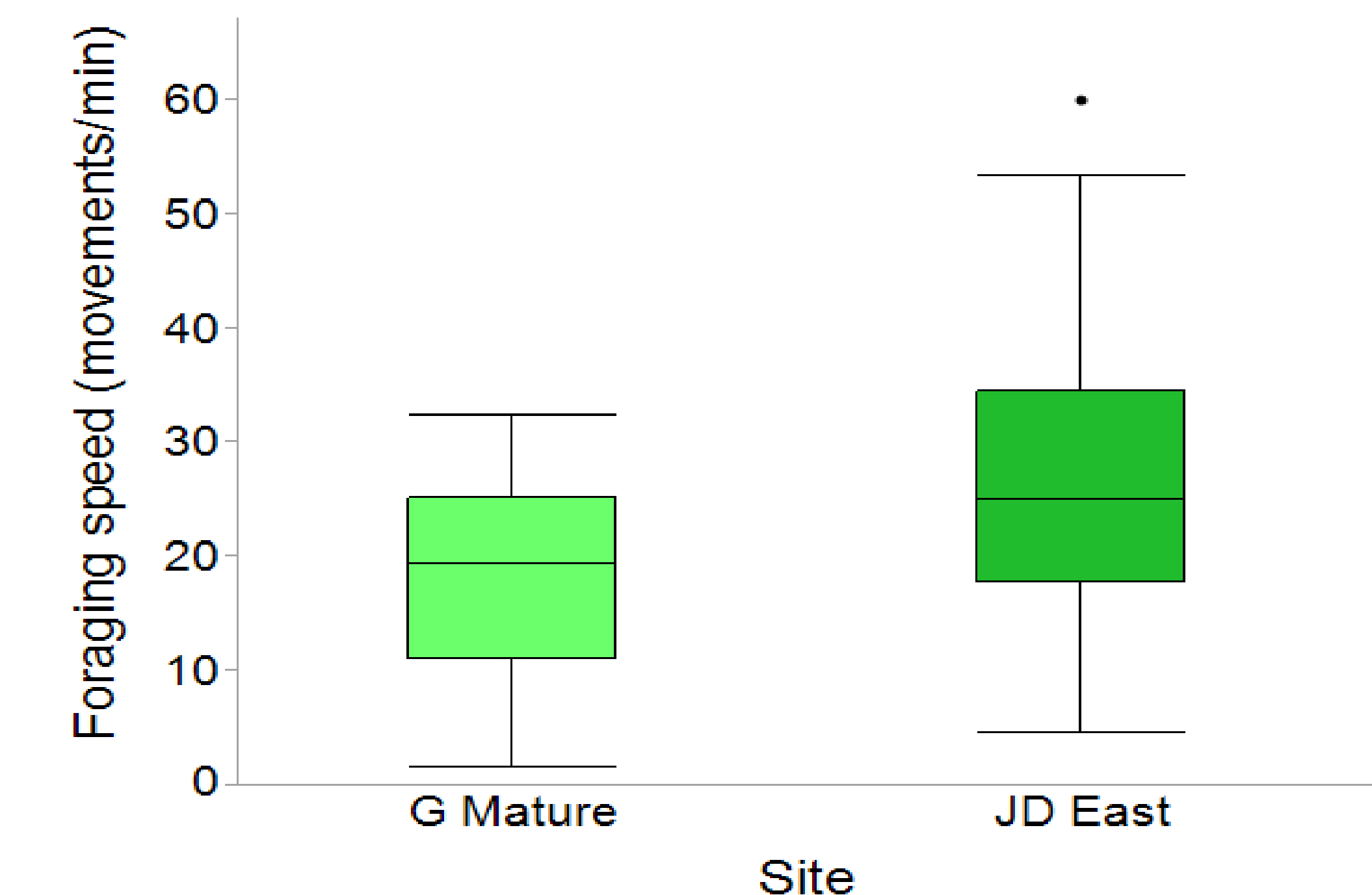


Figure 4. Foraging Speed (movements/minute) for Prothonotary Warbler between sites (p-value= 0.04)

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