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Title: The Causes and Consequences of Habitat Occupancy During the Non-breeding Season for Black and White Warblers in Jamaica

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ABSTRACT

During the non-breeding season, migratory birds occupy a variety of habitats and often segregate between these habitats based on sex and age differences. Such differences in habitat use have been shown to influence individual condition and carry-over to affect events during the breeding season in some species. We studied habitat occupancy patterns, their causes and effects in black and white warblers (*Mniotilta varia*) during the non-breeding season in coastal scrub and mangrove forests in Jamaica. We found that each habitat type was female-biased with up to three times more females than males. However, within each habitat black and white warblers exhibited patterns of sexual segregation where dominant males excluded subordinate females from access to high quality sites. In each habitat type, males showed significantly higher levels of territoriality than females. Males engaged more frequently in agonistic interactions with conspecifics, exhibited higher levels of aggression to simulated territory intrusions, and utilized smaller home ranges where they shared less overlapping area with other males. We also found differences in vertical foraging structure between males and females within a habitat, where females foraged primarily in the understory and males foraged

most often in the mid-canopy and canopy. The between and within habitat structuring differentially affected access to available prey resources with males experiencing higher prey attack rates and fewer search maneuvers to locate prey. Additionally, regardless of habitat, males were found to maintain body condition over the non-breeding period. These data suggest behavioral dominance structures sexual segregation at these sites in Jamaica. The pattern results in male black and white warblers securing access to sites within habitats that likely contain stable levels of prey resources whereas females are excluded and forced to occupying less suitable sites over the non-breeding season. These results suggest that although habitats are female-biased, this may not be an indication that the habitat is of higher suitability for females. Black and white warblers represent yet another species to exhibit patterns of sexual segregation and associated consequences during the non-breeding season. Furthermore, our results confirm that scrub and mangrove habitats differ in suitability for this species. Additional research understanding patterns of habitat suitability across the species range and throughout its annual cycle is essential to understand the factors that underlie the population dynamics of black and white warblers.