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**INSTANCES OF PARENTAL NEST DEFENSE BEHAVIOR IN A  
BACHMAN'S SPARROW (*Peucaea aestivalis*) AND A FLORIDA  
GRASSHOPPER SPARROW (*Ammodramus savannarum floridanus*)**

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Here we report instances of parental nest defense behavior in a Bachman's Sparrow (*Peucaea aestivalis*) and a Florida Grasshopper Sparrow (*Ammodramus savannarum floridanus*) at Three Lakes Wildlife Management Area (TLWMA) in Osceola County, Florida. The Florida Grasshopper Sparrow is a critically endangered subspecies endemic to dry prairie habitat of south-central Florida (USFWS 1999). The Bachman's Sparrow, also declining across much of its range (Sauer et al. 2011), is found throughout the southeastern United States in pine-dominated forests and a number of open habitats (Dunning 2006), including dry prairie (Perkins and Vickery 2005).

We discovered and monitored nests of grassland birds as part of a multiyear study examining the role of prescribed fire and predation on reproductive success at TLWMA. In addition to traditional nest monitoring methods we installed motion-activated miniature nest cameras at the entrance of some nests (Cox et al. 2012). We reviewed the recordings from these cameras to identify nest predators, confirm nest fates, and document behaviors at the nest.

During the 2015 breeding season at TLWMA we recorded 14 nest predation events, 13 of Florida Grasshopper Sparrow nests and 1 of a Bachman's Sparrow nest. Of these 14 nests, 6 were preyed upon during daylight, and of those nests, we observed definite nest defense behaviors only at the two reported below. Of the eight nests preyed upon at night, no defensive parental behaviors were recorded.

On 7 June 2015, we recorded an adult male hispid cotton rat (*Sigmodon hispidus*) preying on a Bachman's Sparrow nest that contained three 3- to 4-day-old nestlings. We were unable to identify individual birds, because the nesting pair had not been banded. The rat first arrived at the nest at 1855 EST, when no adult Bachman's Sparrows were visible. The rat inserted its head inside the nest cup and presumably began eating the nestlings until 1859, when an adult Bachman's Sparrow flew at the rat's backside with feet outstretched. The rat immediately fled. The sparrow paused briefly at the nest entrance before rushing away in the same direction as the rat. At 1900 the rat returned and removed a dead nestling from the nest and carried it underneath the camera mostly out of view. At 1902 the rat was presumably attacked another time, as it jumped away suddenly and the vegetation rustled, but a bird was not seen. The rat did not reappear, and there were no other signs of attack by a bird within view of the camera. A Bachman's Sparrow returned to the nest at 1907 for the first time since the initial attack, looked in the nest for 7 s, and then walked away. By 1910 at least one Bachman's Sparrow had removed the two remaining nestlings (both dead) and two fecal sacs from the nest. The adults brought food to the empty nest multiple times before nightfall and again early the next morning, but the nest was left unattended during the night and was abandoned shortly after sunrise.

On 26 June 2015, we recorded a southern black racer (*Coluber constrictor priapus*) approximately 75 cm long preying on a Florida Grasshopper Sparrow nest. At 0839 that

same day, prior to the predation, we directly observed this nest and it contained two nestlings less than one day old and one unhatched egg. The breeding male of this nest was banded, and the breeding female was unbanded. The snake first approached the nest at 1053, immediately flushing the brooding female. The snake quickly entered the nest, removed one nestling, and began swallowing it. While the nestling was still visible in the mouth of the snake, an adult Florida Grasshopper Sparrow attacked the snake, striking it once with its feet and wings. The snake, with the nestling still in its mouth, went out of view of the camera for 30 s before returning to the nest. It then removed a second nestling and began consuming it. The snake was attacked by a sparrow again and moved out of view for approximately 1 min. At 1055 the snake returned and consumed the last of the nest's contents by coiling within the nest (it is unknown whether the egg had hatched by this time). The snake remained at the nest for another 4 min and was attacked by a sparrow several times. The snake frequently struck at the sparrow during these attacks. At 1100 the snake left the vicinity of the nest, and the unbanded female returned and sat in the empty nest. The snake returned to the nest periodically during the next couple of hours, and if the female was present, she assailed it. On two of these occasions, immediately before the snake came into view of the camera, the female fluttered her wings and darted around in front of the nest. The snake was not observed again after 1244. The female and male returned to the empty nest a number of times that day, occasionally bringing food. The female sat in the empty nest intermittently until 1936, when she was seen on camera for the last time.

When successful, parental nest defense can increase reproductive success, but attacking or distracting a predator also increases a bird's risk of injury or death (Montgomerie and Weatherhead 1988). Though rarely observed, nest defense mortalities have been reported in Killdeer (*Charadrius vociferus*; Brunton 1986), Kentish Plover (*Charadrius alexandrinus*; Amat and Masero 2004), and Veery (*Catharus fuscescens*; King 1999). Although nest defense behaviors have not been previously reported in the Florida Grasshopper Sparrow or the Bachman's Sparrow, they have been documented in other sparrow species, including the Clay-colored Sparrow (*Spizella pallida*), Savannah Sparrow (*Passerculus sandwichensis*), and Vesper Sparrow (*Poocetes gramineus*) in grasslands in Minnesota and North Dakota (Pietz and Granfors 2005) and in the Mountain White-crowned Sparrow (*Zonotrichia leucophrys oriantha*) in subalpine meadows in California (Morton et al. 1993). It is still unclear how frequently these nest defense behaviors are performed by either species in our study. Additional nest camera studies on both species may help reveal the frequency of nest defense and costs to the birds involved. Identifying the sources of adult mortality will inform conservation efforts for these declining songbirds.

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