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## FLORIDA SCRUB-JAY NESTLINGS PREYED UPON BY AN EASTERN COACHWHIP

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Considerable indirect evidence implicates diurnal snakes as major predators on eggs and nestlings of Florida Scrub-Jays (*Aphelocoma coerulescens*; see Schaub et al. 1992). Despite observations of an eastern coachwhip (*Masticophis flagellum*; Webber 1980) and an eastern indigo (*Drymarchon corais*; Mumme 1987) preying upon fledgling Florida Scrub-Jays and Westcott's (1970) finding nestling Florida Scrub-Jays in the stomach of a dead coachwhip, there are no direct observations of either eggs or nestling Florida Scrub-Jays being taken by snakes. Lohrer (1980), however, observed a coachwhip preying upon nestling Blue Jays, (*Cyanocitta cristata*). In this report, I describe predation of two of a brood of three 11-day-old Florida Scrub-Jay nestlings by an eastern coachwhip.

On 6 May 1998, I conducted a nest watch to quantify feeding rates by nonbreeding helper Florida Scrub-Jays at Archbold Biological Station. The study area is described in detail by Woolfenden and Fitzpatrick (1984) and Schoech et al. (1991, 1996). I set up a blind of camouflage netting approximately 50 m from the nest and observed through a 20-60 × Bausch and Lomb spotting scope set at approximately 25 × Each of three nestlings had been weighed and given a unique colorband combination five hours earlier. I began to watch the nest at 1643 h; at 1653 h the adult jays began scolding near the nest. The group consisted of a breeding pair and two helpers and, based on the quality of the vocalizations, all members of the group were involved in the mobbing. At 1655 h I noticed the branches about the nest begin to shake slightly, as they do when an adult jay approaches to feed the nestlings. I first observed the snake when it was about 0.5 m from the nest. The snake rapidly approached the nest and struck one of the nestlings, held the nestling briefly, readjusted its grip, and began to swallow the nestling. The snake then moved away from the nest with the nestling firmly in its jaws. The nestling taken (band combination, -ZL) weighed 47.8 g, an average weight for a healthy day-11 Florida Scrub-Jay. I estimated the coachwhip at between 1.5 and 2 m long.

Scarcely 30 seconds had passed from the time the snake first appeared until it disappeared from view. Although I could not see the snake for the next several minutes, the continued vigorous scolding by the jays suggested that it remained in sight nearby. For the next 4 min the scolding continued in the general vicinity of the nest. At 1700 h the snake again entered my field of view from the direction from which it had exited the nest site. The events were much the same as before with another nestling being struck, gripped, and carried away from the nest. The second nestling (-ZF) weighed 46.7 g. This time, the snake probably concealed itself while swallowing the second nestling because the jays ceased scolding after the snake moved away from the nest. During the next several minutes the breeding female came to the nest several times and spent considerable time investigating and subsequently pecking vigorously at the nest lining. I have seen this behavior many times during other nest watches and consider it unlikely to be associated with the predation event.

At 1711 h, scolding recommenced and I anticipated the reappearance of the coachwhip. However, I was not prepared for the manner of that reappearance. In both of the previous attacks the snake had approached the nest on the same horizontal plane as the nest, approximately 1 m above ground. This time the coachwhip erupted from beneath the center of the nest nearly knocking the palmetto fiber nest lining from its twig foundation. As the snake passed through the center of the twigs its body knocked the nest

cup of palmetto fibers askew; the remaining nestling stayed in the cup that was now facing away from the snake at a 60 degree angle. After approximately a third of the snake's body passed through the nest foundation, the snake turned and struck at the nestling twice; however, the fiber cup was between the snake and the nestling. Seemingly foiled by the mouthful of fibers rather than the nestling, the coachwhip turned, struck unsuccessfully three times at the adult jays that were fluttering nearby, and departed. I could not see the snake's progress, but based on the location of the mobbing vocalizations it seemingly traveled 100 m in less than a minute. The coachwhip did not return for the remaining nestling which fledged successfully one week later.

The preceding account has implications for several aspects of Florida Scrub-Jay biology. First, although strong circumstantial evidence implicates coachwhips as Florida Scrub-Jay predators (Schaub et al. 1992), this is the first direct observation of nest predation by an eastern coachwhip. Second, Florida Scrub-Jays not uncommonly experience brood reduction (Woolfenden and Fitzpatrick 1984, pers. obs.). Often, when the nestling lost is the light weight, brood reduction is suspected to be a case of a nestling starving to death and being removed by a parent. However, sometimes brood reduction occurs with the loss of a large, seemingly healthy nestling. We now have evidence that some of these cases may be attributed to predation (see also Schaub et al. 1992). Third, it seems unlikely that in the absence of mobbing by numerous jays that the snake would have retreated without consuming the remaining nestling. Therefore, this observation suggests that mobbing is successful at times in driving away a predator (at least one that already has had a substantial 94.5 g meal). Fourth, it illustrates one means by which the presence of helpers may reduce predation on nestlings, as has been postulated by numerous workers on Florida Scrub-Jays (e. g., Woolfenden and Fitzpatrick 1984, Mumme 1992, Schaub et al. 1992).

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