

## FLORIDA SCRUB JAY KILLS A MOCKINGBIRD<sup>1</sup>

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**Key words:** Florida Scrub Jay; *Aphelocoma c. coerulescens*; interspecific aggression; omnivory; Northern Mockingbird; *Mimus polyglottos*.

Florida Scrub Jays (*Aphelocoma c. coerulescens*) are aggressive, omnivorous birds which, though predominantly insectivorous and granivorous (on acorns), occasionally eat small vertebrates including frogs, lizards, snakes, rodents, and fledgling birds (Woolfenden and Fitzpatrick 1984; R. L. Curry, G. E. Woolfenden, and J. W. Fitzpatrick, unpubl. data). Here I describe a related but previously unreported behavior: a Scrub Jay attacked, killed, and fed on a healthy adult Northern Mockingbird (*Mimus polyglottos*).

At 08:29 on 3 April 1989, I began a 1-hr focal-animal watch, designed to measure jay activity budgets and habitat use, in the main Scrub Jay study area at Archbold Biological Station in south-central Florida (see Woolfenden and Fitzpatrick 1984). The sample subject was a 7-year-old adult male breeder (color-band combination YS-F) habituated to close observation. For 20 min this jay foraged and perched in scrubby oaks and pine flatwoods within 100 m of his nest, where his mate was incubating four eggs she had laid 20 to 23 March, near the center of their territory (approximately 11 ha in area). At 08:49 YS-F occupied an exposed perch atop a 5-m pine tree, 15 m from the nest, and engaged in sentinel behavior (McGowan and Woolfenden 1989) for 3 min. At 08:52, he flew directly and quickly about 60 m, crossing a large grassy depression, and struck a Northern Mockingbird that was perched about 2 m above the ground on a low branch of a pine situated inside the jay territory about 100 m from its perimeter.

With their legs tangled and wings flapping, the two birds tumbled to the ground and continued fighting amid thick grass and palmettos (*Serenoa repens*) even when I stood 2 m away. The jay held the mockingbird with its feet, pinning it to the ground, and pecked at the mockingbird's head below and behind the left eye with repeated jabs similar to those used in opening acorns (Zusi 1987). The mockingbird emitted continuous harsh screams (to which only a single Rufous-sided Towhee [*Pipilo erythrophthalmus*] responded, perching briefly in vegetation 5 m away) until 08:57. I could then see the jay removing feathers from a wound about 1 cm wide on the victim's head. The jay continued to pull feathers and to swallow small morsels of tissue from this wound until 09:02. (YS-F's pecks

had penetrated the skull a few millimeters, so he may have eaten brain tissue as well as skin, muscle, and blood.) He then flew to a nearby shaded perch in a pine, where he rested for 4 min, occasionally wiping his bloodied bill on a branch, before flying back to the vicinity of his nest and resuming normal foraging. Neither YS-F nor either of the other members of his group (his mate and a yearling helper) exhibited any interest in the dead mockingbird during the remainder of the sample period or immediately afterwards. I collected the carcass at 09:45.

On 14 December 1988, YS-F weighed 82 g. The mockingbird he killed weighed 42 g; autopsy indicated that it was an AHY female, not yet in breeding condition, with moderate amounts of body fat and its stomach full of berries (*Ilex glabra*). This incident illustrates that Scrub Jays are capable of killing healthy adult birds up to half their size. No other jay has been seen to kill an adult bird in over 900 hr of focal-animal samples collected since 1987 (R. L. Curry, G. E. Woolfenden, and J. W. Fitzpatrick, unpubl. data), though brief aggressive encounters with mockingbirds, towhees, and other birds have occurred. A possibly exceptional circumstance of the incident described above is that the mockingbird became tangled in thick vegetation after the two birds tumbled to the ground; one wing was hooked behind the petiole of palmetto frond when I collected the carcass. It seems likely that YS-F was able to kill this mockingbird only because it was unable to escape.

Because Scrub Jays are known to eat small vertebrates, YS-F may have attacked this mockingbird simply to eat it. If so, it is difficult to understand why he consumed only a small part of the carcass. One alternative explanation is that YS-F's behavior constituted defense of its nest or territory or both. Additional observations are supportive: when YS-F's activity was next sampled on 12 April, 1 day after the eggs in his nest had hatched, he directed similar attacks at both an adult male towhee and an adult Brown Thrasher (*Toxostoma rufum*). In each instance, YS-F flew from the same perch from which he had launched his attack on the mockingbird and struck at the other bird as it fed on the ground between the jay and his nest; both potential victims evaded the pursuing jay by flying fast and low through thick scrub, moving away from the nest area but remaining within the jay territory. The mockingbird killed earlier was perched quietly far from the jay nest when it was attacked, however, a detail that is difficult to reconcile with nest defense. Regardless of whether these attacks had any functional significance, the jay's unusually aggressive behavior may have been associated with elevated testosterone levels lingering after the laying period (Balthazart 1983). At

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other times of the year, Scrub Jays are usually tolerant of mockingbirds in their territories, and individuals of the two species often perch on adjacent branches of a single tree. Most aggressive interactions between the species are brief, do not result in injury of either bird, and seem to involve conflict over exposed perches used on both jays and mockingbirds when scanning for aerial predators, or territorial intruders, or both (pers. observ.).

Though extraordinary, the observation described above suggests that aggression from Scrub Jays poses a risk to adult mockingbirds and other small passerines. In this regard it is notable that few mockingbirds nest in recently burned scrubby flatwoods at Archbold Biological Station (Woolfenden 1969); many hold winter territories there during the nonbreeding season (Woolfenden 1970), but most leave to breed in other nearby habitats (Halkin 1983) rarely used by Scrub Jays (Woolfenden and Fitzpatrick 1984). Scrub Jays approaching mockingbird nests are actively mobbed and are therefore likely nest predators, but mockingbirds face other potential nest predators in forest and edge habitats (e.g., Blue Jays, *Cyanocitta cristata*). I speculate that the risk of injury or death from Scrub Jay attacks could help to explain why so few mockingbirds nest in open scrub habitats at Archbold Biological Station.

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## CUCKOLDRY IN AN AMERICAN KESTREL TRIAD<sup>1</sup>

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*Key words:* American Kestrel; desertion; dominance; extra-pair copulation; *Falco sparverius*; sex ratio; sperm competition.

The American Kestrel (*Falco sparverius*) is a small, monogamous, sexually dimorphic falcon which ranges throughout North and South America. Several studies have reported promiscuous behavior in kestrels early in the breeding season (Fast and Barnes 1950, Cade 1955, Balgooyen 1976). Balgooyen (1976) observed promiscuity in female kestrels prior to the formation of site tenacity and pair-bonding. He suggested that early copulations may act as a mechanism for bringing female kestrels into sexual readiness, and stated that promiscuous behavior by females apparently does not elicit "jealousy" in male kestrels that witness these acts.

During spring 1985, I observed two instances of cuckoldry involving a paired female, her mate, and an unpaired neighboring male. Both episodes of extra-pair copulations (EPCs) occurred more than a month after the female had paired with her mate, as determined by her exclusive use of his territory, and within 12 days of the onset of egg laying. The EPCs occurred as the mated male was foraging in an agricultural field at distances >100 m from the female. On both occasions, the unpaired male approached the female while she perched at a favored promontory. The female immediately exhibited solicitation behavior which included drooping her wings, leaning forward, and lifting her tail feathers (see Willoughby and Cade 1964). The unpaired male responded each time by mounting the female, and both EPCs proceeded to presumed cloacal contact and ejaculation. The female's mate apparently witnessed both EPCs; each time he gave *klee* vocalizations as he flew to the preening, postcopulatory birds, driving the unpaired male away. After the first EPC, the female then solicited mounting by her mate and

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