

- behavioral ecology and natural history. Comstock Publishing, Cornell University, Ithaca, NY.
- TRIVERS, R. L. 1972. Parental investment and sexual selection, p. 136–179. *In* B. Campbell [ed.], *Sexual selection and the descent of man*. Aldine Publishing, Chicago.
- VENIER, L. A., P. O. DUNN, J. T. LIFJELD, AND R. J. ROBERTSON. 1993. Behavioral patterns of extra-pair copulation in Tree Swallows. *Anim. Behav.* 45:412–415.
- WATERMAN, J., A. DESROCHERS, AND S. HANNON. 1989. A case of polyandry in the Black-capped Chickadee. *Wilson Bull.* 101:351–352.
- WESTNEAT, D. F. 1992. Do female Red-winged Blackbirds engage in a mixed mating strategy? *Ethology* 92:7–28.
- WETTON, J. H., R. E. CARTER, D. T. PARKIN, AND D. WALTERS. 1987. Demographic study of a wild House Sparrow population by DNA fingerprinting. *Nature* 327:147–149.

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SEX-RELATED DIFFERENCES IN DISTRACTION-DISPLAYS BY FLORIDA SANDHILL CRANES¹

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Key words: Florida Sandhill Cranes; *Grus canadensis pratensis*; sexual differences; distraction displays.

In the wild, parent birds with young have been observed to distract predators with a wide range of behaviors. These range from active defense by attacking the predator (e.g., Audubon's Crested Caracara, *Polyborus plancus*; Yosef and Yosef 1992) and trying to prevent its approach of the area where the young are (e.g., Black-capped Chickadees, *Parus atricapillus*, Long 1982; Redshank, *Tringa totanus*, Warburg 1952), to distraction of predators by sneaking away from the location and then flying away in a conspicuous manner (e.g., Eastern Meadowlarks, *Sturnella magna*, pers. observ.), or even "mock brooding" in which the bird sits on the ground as if incubating and occasionally bends down as if to arrange imaginary eggs (e.g., Dotterel, *Eudromias morionellus*; Nethersole-Thompson and Nethersole-Thompson 1986).

One of the most well-known distraction displays in birds is the "broken-wing act" (Skutch 1976). It is also known as feigning injury, feigning a broken wing, broken wing ruse, parental ruse, lure display, disablement reaction, diversionary display. The parent bird feigns injury, and limps while holding a wing down as if it was broken. When the predator perceives the parent as potentially easy prey, it attempts to catch it. When sufficiently distanced from the young, the parent flies away. This behavior is well-developed in many species including McCowan's Longspur, (*Calcarius mccoenii*) that have been observed in "cooperative injury simu-

lation" (Skutch 1976, Nethersole-Thompson and Nethersole-Thompson 1986). This specific behavior has been extensively described in a wide range of species, mainly waders (see Nethersole-Thompson and Nethersole-Thompson 1986) and nighthawks (*Chordeiles chloris*; Skutch 1976). However, it is virtually unknown in larger species. This includes cranes (*Grus* spp.), except for the Common Cranes (*G. grus*; Cramp 1980).

I have been unsuccessful in finding similar observations in the existing literature on Sandhill Cranes (*G. canadensis*) (e.g., Bent 1926, Walkinshaw 1949, Voss 1977, Nesbitt and Archibald 1981, Johnsgard 1983). Here I report observations recorded at the MacArthur Agro-ecology Research Center (MAERC) of the Archbold Biological Station, Highlands County, south-central Florida. MAERC is a 4,200-ha working cattle ranch that has extensive Bahia-grass (*Paspalum notatum*) pastures. Barbed wire fences bound the pastures. These observations were made during 1990–1993 in the post-hatching period (April–May).

I accidentally witnessed my first distraction display by a female Sandhill Crane in May 1990. While driving through pastures on a four-wheeled motorcycle (ATV), I observed two adult Florida Sandhill Cranes (*G. canadensis pratensis*) running from me while I was about 300 m away from them. I drove to about 75 m from the pair and observed them through binoculars. I noticed that they had two young running with them. The young were less than two weeks post-hatch and retained their reddish-brown down feathers. When I attempted to get closer, the male started to call loudly and attempted a "directed walk-threat" (Nesbitt and Archibald 1981) towards me. The young then disappeared from sight, and the male and female flew away and landed about 50 m away from their previous position. I walked into the general area and searched the ground. After an extensive search I found only one of

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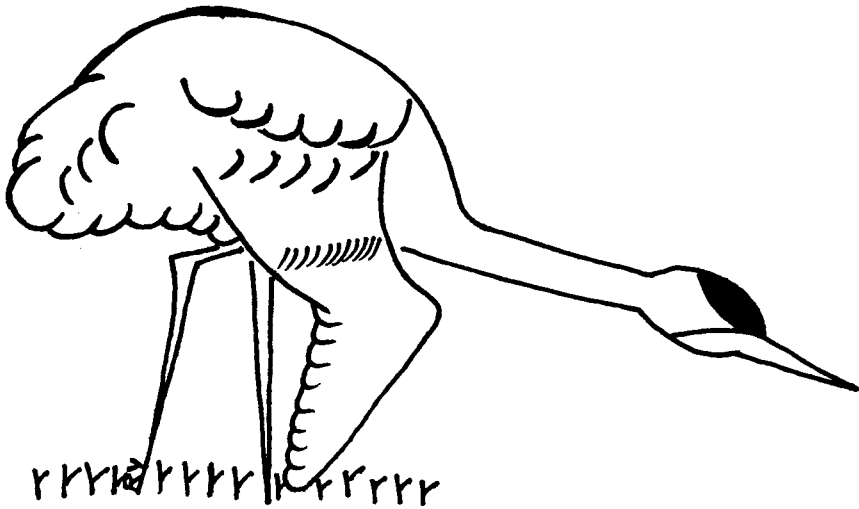


FIGURE 1. Distraction display of female Florida Sandhill Cranes (*Grus canadensis pratensis*) when disturbed with young that have left the nest but are as yet unable to fly. Drawn from slide by author.

the young, which was crouched on the ground with its neck extended, and its head flattened against the ground. Upon seeing me, the young pecked at me.

I then observed the adults that had approached to within 30 m of me. The male strutted with stiff legs and outstretched neck and incessantly alternated between clapping his beak and calling loudly. The smaller female was silent but made herself conspicuous by holding her right wing at an angle to the ground (Fig. 1), walking with an exaggerated limp, and stretching her neck out, giving the impression of an injured bird. I recognized this as a broken-wing distraction display and was surprised to see it carried out by such a large bird.

During the same breeding season in 1990, I observed four more pairs give me their identical, sex-specific distraction behaviors. In subsequent years, I approached all pairs of Sandhill Cranes that I saw with flightless young. I observed 18 such displays (1990—four, 1991—seven, 1992—four, 1993—three). In all cases, I elicited the broken-wing act from the female, and the strutting and calling behavior from the male. Further, the male always placed himself between me and the distraction-displaying female. Although the cranes were not banded or wing-tagged for individual identification I am certain, based on the location of the pairs on the ranch and the differences in ages of young, that in each of the years I have observed separate pairs (Bennett and Bennett 1992, Urbanek and Bookhout 1992). However, I cannot say the same for different years when I most probably observed pairs from previous seasons.

John Fitzpatrick has also observed this behavior during the same years at the same ranch. Although the Florida Sandhill Crane has been studied extensively, this distraction-display behavior has not been recorded. It is possible that this specific behavior can be elicited only during the period of their breeding cycle

when the young are incapable of flight. In addition, this behavior may have developed in only a portion of the Florida subspecies in reaction to an unidentified predator of young in their most vulnerable stage, and has thus not been previously observed. Slides of these observations are archived in the slide collection of the Archbold Biological Station and with the author.

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LITERATURE CITED

- BENNETT, L. A., AND A. J. BENNETT. 1992. Territorial behavior of Florida Sandhill Cranes in the Okefenokee Swamp, p. 177–181. *In* D. A. Wood [ed.], Proc. 1988 N. Am. Crane Workshop.
- BENT, A. C. 1926. Life histories of North American marsh birds. U.S. Nat. Mus. Bull. 135.
- CRAMP, S. 1980. Handbook of the birds of Europe, the Middle East, and North Africa. The birds of the Western Palearctic. Vol. 2. Oxford Univ. Press, Oxford, England.
- JOHNSGARD, P. A. 1983. Cranes of the world. Indiana Univ. Press, Bloomington, IN.
- LONG, C. A. 1982. Comparison of the nest-site distraction displays of Black-capped Chickadee and White-breasted Nuthatch. *Wilson Bull.* 94:216–218.
- NESBITT, S. A., AND G. W. ARCHIBALD. 1981. The agonistic repertoire of Sandhill Cranes. *Wilson Bull.* 93:99–103.
- NETHERSOLE-THOMPSON, D., AND M. NETHERSOLE-THOMPSON. 1986. Waders—their breeding, haunts and watchers. T. & A.D. Poyser, Calton, England.
- SKUTCH, A. F. 1976. Parent birds and their young. Univ. of Texas Press, Austin, TX.

- URBANEK, R. P., AND T. A. BOOKHOUT. 1992. Nesting of Greater Sandhill Cranes on Seney National Wildlife Refuge, p. 161–167. *In* D. A. Wood [ed.], Proc. 1988 N. Am. Crane Workshop.
- VOSS, K. S. 1977. Agonistic behavior of the Greater Sandhill Crane, p. 63–85. *In* R. D. Feldt, [ed.], Proc. Symp. on the eastern population of the Greater Sandhill Crane. Michigan City, Indiana.
- WALKINSHAW, L. H. 1949. The Sandhill Crane. Cranbrook Inst. of Science, Bull. 29, Bloomfield Hills, MI.
- WARBURG, G. 1952. Distraction behaviour of Redshank. *Br. Birds* 45:37–38.
- YOSEF, R., AND D. YOSEF. 1992. Hunting behavior of Audubon's Crested Caracaras. *J. Raptor Res.* 26:100–101.

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VOICE, PLUMAGE AND NATURAL HISTORY OF ANTHONY'S NIGHTJAR (*CAPRIMULGUS ANTHONYI*)¹

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Key words: *Caprimulgus anthonyi*; natural history; vocalizations.

Caprimulgus anthonyi remains one of the least known Neotropical nightjars. When Schwartz (1968) suggested elevating *C. anthonyi* back to species status, nothing was known beyond the minimal label data of the two specimens that he examined (unbeknownst to him, a third specimen existed in Paris [Berlioz 1937]). Here we summarize information on this species gathered since Schwartz's review.

Caprimulgus anthonyi was originally described as a species (Chapman 1923), but was subsequently treated, without explanation for the change, as a subspecies of the widespread species *Caprimulgus parvulus* by Peters (1940) and Meyer de Schauensee (1966). Schwartz (1968) re-emphasized the significant plumage differences between *C. anthonyi* and all populations of *C. parvulus* and suggested that *C. anthonyi* was better regarded as a separate species. Schwartz also noted similarities between *C. anthonyi* and *C. cayennensis* in certain plumage features, most notably in tail pattern, and in apparent habitat preferences. However, he refrained from making any definitive statements about the relationships of these taxa, because at that time the vocalizations of *C. anthonyi* were unknown. The song of *C. anthonyi* has now been documented (Fig. 1), and it bears no resemblance to either *C. parvulus* or *C. cayennensis*. Unlike the latter two species, both of which have complicated, multiple-noted songs (Hardy et al.

1989), *C. anthonyi*'s song is a simple, two-noted "treeow," about 0.24 sec in duration. We know of no other Neotropical caprimulgid whose song is similar to *anthonyi*'s, and thus the vocalizations of *C. anthonyi* do not offer any clues as to its relationships.

DISTRIBUTION

Twenty-four specimens (21 skins, two skeletons, one alcoholic; ANSP, LSUMZ, MECN) of *C. anthonyi* have been collected since Schwartz's treatment. Prior to field work in northern Peru by the Louisiana State University Museum of Natural Science (LSUMNS) staff in the 1970s and early 1980s, this nightjar had been recorded from only three localities in the drier Pacific Ecuadorian lowlands and adjacent arid foothills. These sites were widely scattered and demonstrated that *C. anthonyi* was at least locally distributed from along the coast near the Colombian border (Vaquería, Prov. Esmeraldas) to within 60 km of the Peruvian border (Portovelo, Prov. El Oro). The LSUMNS surveys in Peru extended *C. anthonyi*'s range southward in the arid Pacific lowlands as far as Las Pampas, Depto. Lambayeque. An isolated population was also discovered at the northern end of the upper Río Marañón Valley (Bagua, Depto. Amazonas; near Jaén, Depto. Cajamarca; Fig. 2). A number of other avian taxa share a similar distribution pattern (e.g., *Otus roboratus*, *Veniliornis callonotus*, *Myiarchus phaeocephalus*, *Mimus longicaudatus*). Additional work by ANSP workers in Ecuador has further delineated this species' range there (Fig. 2). *Caprimulgus anthonyi* has been recorded as high as 750 m in the arid foothills of southern Ecuador (Portovelo, Prov. El Oro, American Museum of Natural History, New York, 166785; near Mangaurcu, Prov. Loja, ANSP 185144-5) and at 775 m in the Marañón Valley (near Jaén, Depto. Cajamarca, LSUMZ 87307).

From Figure 2, it appears that *C. anthonyi*'s range

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