

SHORT COMMUNICATIONS

OBSERVATIONS ON STRICKLAND'S WOODPECKER, *DENDROCOPOS STRICKLANDI*

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I observed some aspects of the behavior of several pairs of Strickland's Woodpeckers at La Cima, Distrito Federal, México, in late January and early February 1966. In this area the predominant trees are pines, many of which are large, with smaller oaks scattered throughout.

TERRITORIAL BEHAVIOR

In late January most of the birds seen were in pairs and appeared to be occupying territories. On 29 January two pairs met, apparently at the boundaries of their territories. There was conflict between the males, but the females did not participate, although one of them persistently gave *shric* calls. The males had several encounters, from low on a pine trunk to high in the branches. The wings were opened and shut rapidly as the birds sparred, but the tail was not spread. Sometimes the wings were held partly open and drooped by one male as it approached the other. Neither bird succeeded in driving the other away. After about five minutes the males flew to their respective mates, which by then had moved in opposite directions from the site of conflict. Both males gave *we-ka we-ka* calls as they flew off. In the same area, Bertram G. Murray, Jr., observed two females fighting in a similar manner earlier on the same day.

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Drumming. Individuals of both sexes drummed often, although not loudly. A female drummed regularly over a period of 22 minutes, while her mate was working on a nest cavity. Both sexes also drummed occasionally as they foraged. *Tapping.* The male tapped loudly several times on the dead stub in which he was excavating, after I disturbed him. *Vocalizations.* (a) *shric* or *pic*. A note of general excitement. (b) *chup*. This was given by the male as he perched near the nest excavation, shortly after his mate flew into the tree. (c) *we-ka we-ka*. This call was given by both sexes, but more often by males as they flew to join their mates. It appeared to be used both in location and identification. (d) *sh-sh-sh-sh*. This is another note of excitement, which may be alternated with the *shric* call.

Most of the sounds described here have been recorded on tape.

MOVEMENTS OF THE PAIR

The members of the pair usually remained close to each other. Females appeared to lead movements

from one area to another, almost always taking flight well before their mates. In a pair observed for several hours, the female was wilder than the male and appeared to be restless much of the time.

NEST SITE AND EXCAVATION

On 31 January I observed a male *stricklandi* excavating a cavity 10 meters above the ground in a dead limb, 18 centimeters in diameter, extending at a 60° angle from the trunk of a living pine. At this time the cavity was large enough to allow about one-half his body inside. He worked from 14:15 to 14:28, then began extensive preening, including direct head scratching, while perched near the nest entrance. After several minutes he resumed work. At 14:37 the male flew to the female, who had been drumming about 40 meters away while he excavated. At 14:42 the male returned and began pecking in a hole about 60 cm above the first cavity, but soon moved to the opposite side of the limb, and then resumed work on the original cavity. The female joined her mate at 14:47, and at 14:50 both birds flew from the site. The gonads of this pair were slightly enlarged on 1 February. Sutton and Burleigh (Auk 59:418-423, 1942) collected a pair of *stricklandi* on 31 March, the male of which possessed a brood patch. This specimen supports my assumption that the excavation described above was to be the nest site. I find no previous description of the nest site of Strickland's Woodpecker.

FORAGING BEHAVIOR

Having investigated sexual differences in foraging behavior in two other species of *Dendrocopos* (*arizonae* and *borealis*), I was interested in determining whether this species demonstrated such differences. I recorded the length of time in seconds that a male *stricklandi* spent in each of four subdivisions of 25 consecutive trees. His mate was much more difficult to observe continuously, and I obtained timings of her foraging sites for only two consecutive trees. Untimed observations on other males and females substantiated the impressions given by this pair. Table 1 presents the results of these stopwatch timings.

The females foraged most of the time high in the trees while the males fed at a variety of lower levels. Both sexes foraged on branches, trunks, and limbs, but the females foraged on twigs to a much greater degree. Males were easily observed, generally flying

TABLE 1. Foraging time in seconds in each of four divisions of a tree.

	Low trunk	High trunk	Branches	Twigs
Male, on 25 consec. trees	803	167	496	178
Female, on 2 consec. trees	—	—	—	224

short distances and at low altitudes. Females, on the other hand, were usually in the upper extremities of the trees and made longer flights.

Males and females appeared to forage in the same way, and uncommonly did feed close together. Probing and peering were the primary means of food searching, although the birds tapped the trunk and larger limbs as they moved along them. Birds of both sexes scratched bark from the trunk with the feet, using both feet simultaneously. I also saw a male scratch bark loose with one foot while retaining his grasp to the tree with the other. On one occasion a male flew vertically up from branch to branch, several feet away from the trunk. Both sexes often foraged upside down on small limbs. These observations, like those of Davis (Auk 82:548, 1965), indicate that searching for food is primarily by means other than vigorous hammering or drilling.

The birds foraged primarily on pines, but also visited oaks. Of 25 consecutive trees in which a foraging male was observed, three were small or medium-sized oaks and the rest were pines.

Hairy Woodpeckers (*D. villosus*) were common in this area, but the two species appeared to take no notice of each other. On several occasions individuals of both species were seen in the same tree.

COMPARISONS WITH OTHER SPECIES OF *DENDROCOPOS*

The fight between the two male *stricklandi* differed from conflicts of *villosus*, *pubescens* (Kilham, Auk 77:259-270, 1960; Condor 64:126-139, 1962; Wilson Bull. 78:251-265, 1966), and *arizonae* (personal observation), in that in these species there is much bill-waving as the heads are swayed back and forth, and the tail of the aggressive bird is spread. In all four species each sex is aggressive only toward intruders of the same sex. Contrastingly, in *borealis* both members of a pair actively attack a single intruder (personal observation). This also appears to be true for *scalaris*.

Both *stricklandi* and *borealis* feed predominantly on

pinus and demonstrate a similar kind of sexual dimorphism in foraging. Males and females of each species forage in different portions of the trees, and beak-length dimorphism is not pronounced. This method of differential foraging is unlike that found in *arizonae* in southern Arizona, where the sexes differ in beak size and utilize the same foraging sites in different ways (personal observation). Davis (Auk 82:566-567, 1965, figs. 6 and 7) presents measurements demonstrating that Arizona populations of *arizonae* are much more dimorphic in beak length than either *stricklandi* or *borealis*.

The single nest site of *stricklandi*, in a dead limb of a living pine, seemed to me to be most like that of *pubescens*. Both *arizonae* (personal observation) and *villosus* (Bent, U.S. Natl. Mus. Bull. 174:14, 1939) often excavate nest cavities in living trees, although the site of excavation may be weak internally. *Borealis* excavates its cavities in living pines (Bent, U.S. Natl. Mus. 174:74, 1939).

Of these comparisons, only the means of territorial fighting may be useful in determining relationships within the genus. This suggests that the affinities of *stricklandi* are indeed with the *arizonae-villosus* group than with the ladder-backed group of North American *Dendrocopos*, as indicated by other lines of evidence. Differences between *stricklandi* and *arizonae* are greater than those between *arizonae* and *villosus*, and suggest that *stricklandi* probably is not conspecific with *arizonae*, as most recently suggested by Davis (Auk 82:537-590, 1965).

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THE DIURNAL ACTIVITY OF THE ROADRUNNER, *GEOCOCCYX CALIFORNIANUS*

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The Roadrunner is a well-known ground cuckoo of the deserts, chaparral edges, and arid grasslands in the southwestern United States and northern México (Dobie 1956; Sutton 1940). Information on the activity of the Roadrunner in relation to the time of day or environmental temperatures is virtually non-existent. Cursorial habits in hot and open locations would seem to place a large burden on the temperature-regulation abilities of this bird. The following observations were made as an adjunct to laboratory studies of the roadrunner (Calder 1966).

The study was made at the Santa Rita Experimental Range, located in desert and desert-grassland vegetation at the eastern edge of the Sonoran Desert, south of Tucson, Arizona. (For a discussion of the vegetation, see Lowe 1964.)

Because of the furtive habits of the species and

its large home range, it was usually difficult to keep track of a Roadrunner for extended periods. Limited observations of nest-spacing, a boundary dispute, and hunting sorties suggested that the territory of an adult pair in this habitat might be about one-half mile in diameter. Thus continuous day-long surveillance was not feasible, and data from shorter observations were pooled to obtain an index of activity (observations per hour afield). In all, 87 observations were made during 164 hours in the field. These ranged from brief roadside sightings to long periods of hunting observed from a hillside vantage point. Observations of Roadrunners that were flushed from the shade or vegetation thickets were excluded from the index because it was not possible to ascertain whether they had been resting or active.

The official maximum air temperature recorded at the range headquarters (elevation 1310 m) during the study period (10 June-5 July 1965) was 38.8° C. This was similar to the average high temperature for this period (Smith 1956). The Roadrunners were observed at elevations of ca. 950-1280 m where air temperatures were slightly higher. The maximum air temperature in the shade recorded in the field was 40.7° C.

The Roadrunners reduced their activity by slightly less than one-half during the hottest hours. The data from hourly intervals (and longer intervals before