

(*Corvus cryptoleucus*) in scavenging remains of previously shot prairie dogs. The owner of the land, Homer Ricketson, said that the prairie dog town is hunted for sport frequently, and the hawks appear regularly when shooting begins. Apparently, the hawks have associated the gunfire with an easily obtained food source, since previous hunters have left the prairie dogs.

I would like to thank Gary D. Schnell for reviewing this manuscript.—RONALD K. CHESSEY, *Dept. of Zoology, Univ. of Oklahoma, Norman, Oklahoma 73019. Accepted 1 Mar. 1978.*

*Wilson Bull.*, 91(2), 1979, p. 331

**Misidentified "Eskimo Curlews."**—In his admirable "Birds of the Labrador Peninsula and Adjacent Areas" (Univ. Toronto Press, 1963:308), Todd mentions the last specimen of the Eskimo Curlew (*Numenius borealis*) known to have been taken in Labrador. This bird, collected by Ernest Doane on 29 August 1932, at Battle Harbour, was reported by Van Tyne (*Wilson Bull.* 60:241, 1948). Todd goes on to say that "the same collector had also taken specimens at Red Bay, on September 5, 1926 (one) and August 29 and 31, 1927 (four). These are in the collection of the University of Michigan Museum of Zoology." All 6 specimens are indeed in the collections of this Museum, but only the first is an Eskimo Curlew. The others are Whimbrels (*Numenius phaeopus hudsonicus*) and were catalogued as such by Van Tyne after they were purchased from Walter Koelz in 1929. There is no indication on the labels that they were ever identified incorrectly. I am at a loss to see how this error came about and feel that it should be corrected.

Todd (*loc. cit.*) deplored the "woefully small" number of specimens of the Eskimo Curlew from Labrador still preserved in scientific collections. While this number is smaller than he believed, it should be pointed out that the critical shortage is in anatomical material of this species. Joseph G. Strauch, Jr., in a search for skeletons of this species was able to find only partial skeletons at the Museum of Comparative Zoology and the United States National Museum. The complete skeleton listed by Ames and Stickney (*Postilla* 118:17, 1968) as at the Peabody Museum of Natural History, Yale University, is another misidentified Whimbrel. Should remains of Eskimo Curlews be found in the future, it is essential that they be preserved whole in fluid or as skeletons.—ROBERT W. STORER, *Museum of Zoology, The University of Michigan, Ann Arbor, Michigan 48109. Accepted 1 Apr. 1978.*

*Wilson Bull.*, 91(2), 1979, pp. 331–335

**The role of parent and helper Red-cockaded Woodpeckers at the nest.**—Breeding pairs of Red-cockaded Woodpeckers (*Picoides borealis*) are often assisted by helpers (Baker, pp. 44–59 in *The Ecology and Management of the Red-cockaded Woodpecker* [R. L. Thompson, ed.], Bur. Sport Fish. Wildl. and Tall Timbers Res. Stn., Tallahassee, 1971; Beckett, pp. 87–95 in *op. cit.*; Lay et al., pp. 74–77 in *op. cit.*; Ligon, pp. 3043 in *op. cit.*; and Ligon, *Auk* 87:255–278, 1970). Information in scanty, how-

ever, regarding the relative contributions made by helpers and the mated pair toward incubation and rearing of young. Baker (1971) reported on 2 days of observations of 2 clans that were feeding nestlings. One clan consisted of a mated pair, while the other clan had a mated pair plus 2 male helpers. In the clan of only a pair, both the male and female fed nestlings, with the male being the more active feeder. In the clan of a pair plus helpers, the breeding female was not observed feeding nestlings, and each of the helpers fed more than the breeding male.

The only other quantitative data have been reported by Ligon (1970). At 3 nests attended by only a pair, the males and females participated equally in the feeding of young. At a fourth nest the male made twice as many trips as the female. At 2 nests with helpers, Ligon did not find helpers incubating, but from limited observation he felt that helpers and parents contributed equally to the feeding and brooding of nestlings, to nest sanitation, and to nest defense. Beckett (1971) reported that all clans he studied (number of clans not reported) contained at least 3 adults during the breeding season, but in only 1 clan did helpers assist in rearing the brood. Lay et al. (1971) are the only observers who have reported that birds other than the mated pair incubate.

A certain amount of variability in woodpecker behavior should be expected, not only among clans but also within clans during different periods of the breeding and nesting season. However, the limited information available on the roles played by Red-cockaded Woodpecker breeders and helpers is in some instances contradictory. Over the past 2 years we have accumulated approximately 495 h of observations on 8 clans of Red-cockaded Woodpeckers while they were attending their nests. The data gained on incubation, feeding of the young, and nest sanitation should help clarify the roles of breeders and helpers.

Between 4 May and 30 June 1976, 4 clans of Red-cockaded Woodpeckers, 2 with helpers and 2 without, were observed for 226 h throughout the period during which they were feeding nestlings. Observations were spaced from the 4th or 5th day after the first egg hatched through the age of 22–26 days. Observations were normally conducted between 08:00 and 17:00, but on some occasions we began observations as early as 06:30 and continued until the clan roosted at approximately 19:50. Individual observation periods for a clan ranged from 6 to 13 h in a single day. With 1 of the clans, we conducted only occasional observations. Observations on this clan were normally made between 16:00 and 19:30, and individual sessions ranged from 2 to 3 h. We observed this clan's activities on 8 different days from 7 days after the first chick hatched through the age of 22 days.

In 1977 we monitored incubation as well as the feeding of nestlings. One clan, a pair, was watched from the day the first egg was laid through 11 days after completion of the clutch: 78 h of observation on 13 successive days. In order to determine the onset of incubation, this nest was at first watched from the time the birds left their roosts in the morning until they roosted in the evening. After the birds began attending the nest at extended, regular intervals, observations were conducted for 6–8 h at a time on alternate mornings and afternoons. A second clan, a pair plus a helper, was watched for 43.5 h during 9 successive days from the day the first egg was laid. This second nest was observed for half-day periods (3–6 h), alternating mornings and afternoons, during the entire incubation period. We continued to monitor the activities of the second clan throughout the period of nestling development. We also observed 3 additional clans (2 with helpers, 1 a pair) throughout the nestling period. Observations were scheduled more rigorously in 1977 than in 1976. One clan was observed on 8 days during the nestling period and the other 3 clans on 10 days each. Observations

were scheduled to sample activity throughout the period of nestling development. Observation time per clan ranged from 34 to 40 h for a total of 148 h. All observations were conducted between 07:30 and 12:30.

All observations were conducted at the clans' nest trees. Individuals in each clan had been uniquely marked with a series of colored plastic bands so that sex and age (1-year-old or older than a year) were known. No clans contained more than 1 female during the nesting season, and the breeding male was identified by noting which bird roosted in the nest cavity. All other birds attending the nest were considered helpers. Observers were equipped with 30-40 $\times$  spotting scopes; each time a bird visited the nest they recorded the time the bird arrived, its identity, whether or not it brought food, and the time it left.

*Age and sex of helpers.*—Red-cockaded Woodpecker helpers are generally believed to be male offspring from previous years (Baker 1971 and Ligon 1970, 1971). Ligon (1970), however, noted 1 female helper in 1 clan, and Baker (1971) noted 2 helpers in 1 clan assisting the breeding pair for 2 successive years. In 1977, 3 of the 4 clans we studied most intensively had helpers. The 4 helpers (2, 1, and 1 per clan) were all males, 2 being offspring from the previous year, and 2 being helpers from the previous year. The age and family lineage of the 2 older birds is not known with certainty since our banding began just prior to the nesting season in 1976. In addition to the 4 clans studied intensively, we collected selected reproduction data on 14 other clans. Six of the 14 clans had helpers, and all 7 helpers were males. Approximate age was known for only 4, 3 being birds that had helped the previous year, and 1 being the offspring of the previous year.

*Incubation.*—Ligon (1970) had no evidence that helpers incubated. Lay et al. (1971), however, noted 2 males incubating at several nests. While our data on incubation are limited, they clearly show that helpers assisted with incubation (Table 1). Whether or not this holds true in all clans with helpers we do not know. At 1 other nest, however, we observed a helper male spend an hour in a nest cavity which contained 4 eggs. J. A. Jackson (pers. comm.) has also observed helpers incubating in colonies in Mississippi. In both clans the breeding males contributed more time to incubation than did the females. In addition to diurnal incubation, breeding males roosted at night in the nest cavity.

*Feeding of nestlings.*—In all clans every individual participated to some degree in feeding nestlings. In clans with and without helpers breeding males tended to feed the nestlings more than did the females (Table 2). At 4 of the 8 nests breeding males fed more than females, at 3 nests males and females contributed equally, and at 1 nest the female fed more than her mate. In clans with helpers, the helpers made a major contribution to the total feeding effort (Table 2). The contribution of individual helpers varied, and some helpers contributed as much as or more than did individual breeders. Cumulatively, helpers seemed to participate in the feeding effort in proportion to their numbers.

*Brooding and nest sanitation.*—In the early stages of nestling development the normal pattern of activity was for the bird bringing food to the nestlings to remain in the nest cavity until another bird arrived with food. All birds bringing food to the nest brooded the nestlings, and there were no major deviations in the brooding pattern from the feeding pattern (Table 2).

The removal of fecal sacs from the nest cavity appears to be a task performed primarily by breeding males. During the 2 nesting seasons reported in this study, we

TABLE 1

CONTRIBUTIONS TO INCUBATION IN 2 CLANS OF RED-COCKADED WOODPECKERS BY PARENT MALES (PM), PARENT FEMALES (PF), AND HELPER MALES (HM)

	Clan 03 <sup>1</sup>		Clan 17 <sup>2</sup>		
	PM	PF	PM	PF	HM
Mean attentive period (min)	10.9	14.5	28.6	18.7	24.7
Percent of total attentiveness	58% <sup>3</sup>	42%	36% <sup>4</sup>	22%	42%

<sup>1</sup>Total observation time = 4684 min.<sup>2</sup>Total observation time = 2617 min.<sup>3</sup>Total attentiveness = 3142 min.<sup>4</sup>Total attentiveness = 2326 min.

have observed fecal sacs being carried from the nest on 187 occasions. Breeding males accounted for 90% of the observations, breeding females 8%, and helper males 2%.

*Reproductive success.*—Although Red-cockaded Woodpecker helpers clearly play an active role in incubation and the feeding of nestlings, their effect on reproductive success is still uncertain. Ligon (1970) noted that at 2 nests with helpers, 2.0 young were fledged per nest; whereas, at 7 nests without helpers, 1.4 young per nest were fledged. He suggested that the growth of nestlings might be accelerated by the pres-

TABLE 2

PARTICIPATION IN FEEDING OF NESTLING RED-COCKADED WOODPECKERS BY PARENT MALES (PM), PARENT FEMALES (PF), AND HELPER MALES (HM)

Seasonal nestings	Total feeding visits	Percentage contributions of total visits					Cumulative contribution of helpers
		PM	PF	HM	HM	HM	
Pairs							
08-76 <sup>1</sup>	735	67%	33%				
16A-76	513	50%	50%				
08-77	211	55%	45%				
Total and means (%)	1459	59%	41%				
Pairs with helpers							
05-76	196	33%	33%	34%			34%
16B-76	798	27%	27%	23%	13%	10%	46%
11-77	411	26%	30%	27%	17%		44%
16A-77	335	42%	27%	31%			31%
17-77	283	29%	23%	48%			48%
Total and means (%)	2023	30%	27%				42%

<sup>1</sup> Seasonal nestings are identified by clan number (08) followed by the calendar year ('76) of the nesting season.

TABLE 3

NUMBER OF YOUNG FLEDGED BY RED-COCKADED WOODPECKERS DURING 2 BREEDING SEASONS FOR PAIRS WITH AND WITHOUT HELPERS

Year	Number of pairs		Fledglings per pair (mean)		Fledglings per pair (range)	
	Without helpers	With helpers	Without helpers	With helpers	Without helpers	With helpers
1976	3	5	1.3	1.6	0-2	0-4
1977	8	8	1.9	2.4	1-3	1-3

ence of helpers, but his sample size was too small for a conclusive comparison. Our data on the effects of helpers on reproductive success are also still inconclusive.

Over the 2 breeding seasons reported in this study, 1976 and 1977, we have collected data on clutch-size, hatching success, and fledging success from a total of 24 nestings involving clans of known size. Eleven of the nestings were by breeding pairs and 13 were by pairs plus helpers. In both years, clans with helpers had an average fledging success higher than pairs alone (Table 3). Reproductive success, however, is affected by factors other than the mere presence of helpers, such as interspecific competition for cavities, nest depredation, habitat quality, and possibly intraspecific social interactions. Until we can better assess the effects some of these additional factors have on reproductive success, and determine possible interrelationships between selected factors such as clan size and habitat quality, we do not feel the effect of helpers on reproductive success can be clearly distinguished from other possible influences.—MICHAEL R. LENNARTZ AND RICHARD F. HARLOW, *U.S. Dept. of Agriculture, Forest Service, Southeastern Forest Experiment Station-Dept. of Forestry, Clemson Univ., Clemson, South Carolina 29631. Accepted 18 May 1978.*

*Wilson Bull.*, 91(2), 1979, pp. 335-338

**Three-week vs 4-week nestling periods in *Picoides* and other woodpeckers.**—A striking fact about the nesting of Downy Woodpeckers (*Picoides pubescens*) is that their nestling period is of 3 (Lawrence, *Ornithol. Monogr.* 5:1-156, 1967) instead of 4 weeks (or thereabouts) as it is for the 4 other woodpeckers with which they are sympatric, namely the Hairy (*P. villosus*) (Lawrence, *op. cit.*) and Pileated (*Dryocopus pileatus*) (Hoyt, *Auk* 61:376-384, 1944) woodpeckers, the Common Flicker (Sherman, *Wilson Bull.* 22:135-171, 1910) and the Yellow-bellied Sapsucker (*Sphyrapicus varius*) (Kilham, *Wilson Bull.* 89:310-324, 1977a). Why should this be?

One might say it is a matter of the downy being able to develop faster because it is of smaller size. That this is unlikely is shown by data given for 4 central European species also of the genus *Picoides* (Table 1). Of these 3, the Lesser (*P. minor*), the Middle (*P. media*) and the Greater (*P. major*) Spotted woodpeckers all have, like the downy, a 3-week nestling period, although *P. major* is of the same approximate size as *P. villosus*. Furthermore if size made a difference, why should the Pileated Woodpecker and its