

Hummingbird (*S. sasin*), which has never been recorded east of Louisiana. Allen's is practically identical to Rufous in female or immature plumage, except for narrower and more sharply pointed outer tail feathers than on Rufous. The outer tail feathers seemed the same size and shape as most other rectrices and did not appear slender.

The hummingbird was first noted by Mrs. Spencer on 20 October, but the last date observed is not known. It seems highly likely that the bird was indeed a Rufous, and there are a large number of confirmed records for this species in the eastern United States (Conway and Drennan, *Amer. Birds* 33:130-132, 1979). Nonetheless, it is best to call the bird a "probable Rufous Hummingbird."

The only confirmed Rufous for the Carolinas is a specimen from Charleston, S.C., on 18 December 1909 (*Auk* 46:237-238). Sight records of probable Rufous—clearly *Selasphorus* as opposed to *Archilochus*—are from Raleigh, N.C., 2 to 5 November 1976 (Hader and Howard, *Chat* 41:70-71); Charleston on 24 January 1981 (*Chat* 45:81); and two birds near Hayesville, N.C., from 17 October to 11 December 1981 (unpublished). All records for the Carolinas involve females or immatures. The two birds at Hayesville were photographed; full descriptions of the birds plus the photos have been sent to the North Carolina State Museum of Natural History, but the descriptions or photos have not yet been published.

Certainly, anyone who observes a hummingbird in the Carolinas with rusty color on the sides, belly, or tail should write a detailed account for the General Field Notes in *Chat*. Much remains to be learned about the identities of hummingbirds not in adult male plumage, and the Rufous is not yet on the Official List for North Carolina.

Cavity Tree Killed by Red-cockaded Woodpeckers

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The Red-cockaded Woodpecker (*Picoides borealis*) is known for its obligate use of living pines as cavity trees and for its excavation of resin wells and a plate around the cavity entrance (Wayne 1910, Ligon 1970, Jackson and Thompson 1971). Resin wells are maintained by the birds, which results in a continuous flow of pine gum that can deter climbing Rat Snakes (*Elaphe obsoleta*; Jackson 1974). The plate is an area that is chipped through the cambium around the cavity entrance. Creation of the plate results in additional gum flow, but maintenance of the plate removes dried gum and keeps it from blocking the cavity entrance. With continued use of the cavity, the plate frequently becomes a bare circle of 20 cm diameter or larger. In a typical cavity tree, about 75 years old for Loblolly Pines (*Pinus taeda*; Jackson et al. 1979), excavation of such a plate does not obviously affect the survival of the tree. Mean diameter at cavity height for 100 Loblolly Pines (mean age = 76.1 years) on Noxubee National Wildlife Refuge, Mississippi, was 39.4 ± 5.3 cm. One might predict that woodpecker cavity, resin well, and plate excavation would have a significant impact on the physiology of smaller trees. I report here the death of a 55-year old Loblolly Pine cavity tree following enlargement of the plate by Red-cockaded Woodpeckers to girdle the tree.

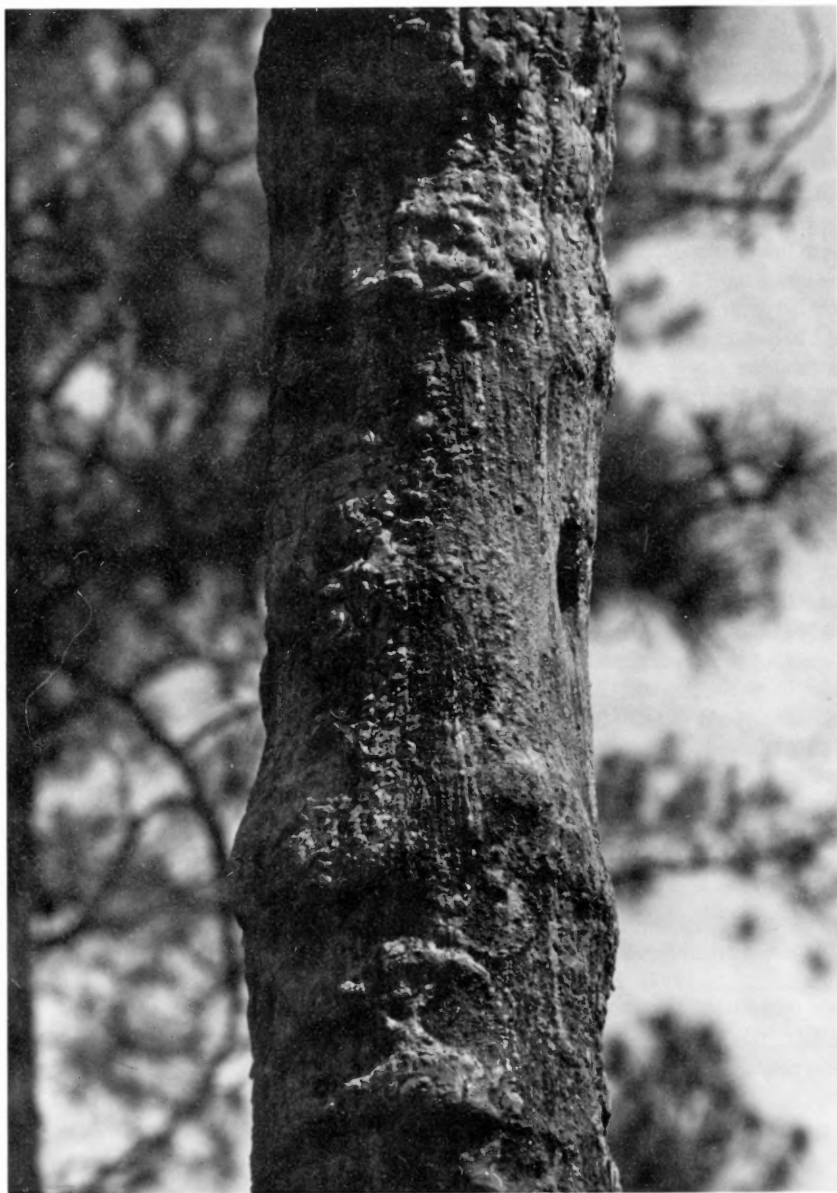


FIG. 1. A 55-year-old Loblolly Pine in Aiken County, S.C., was girdled and killed following enlargement of the plate around a nest cavity by Red-cockaded Woodpeckers. This may explain the species' preference for cavity trees that are more than 70 years old and thus large enough to reduce the possibility of girdling. (Photo by J.A. Jackson)

The tree, on the Savannah River Plant, in Aiken County, South Carolina, had been in active use by Red-cockaded Woodpeckers for at least 2 years when I began monitoring it in 1978. I found two active cavities in the tree, one at 2.4 m and one at 6.1 m. Diameter at breast height was 28 cm, and at cavity height 25 and 22 cm, respectively. In 1978 the plate was about 8 cm in diameter at both cavities. As the plates were enlarged, gum flow was reduced; therefore the birds chipped more and more at both the plates and resin wells. By January 1982, only about 5 cm of cambium was left intact on the trunk opposite the lower cavity and about 7 cm was left opposite the upper cavity. Gum flow had stopped, and the tree was dying. The woodpeckers continued to chip at the plates until May 1982, when the tree was dead, girdled at the lower cavity (Fig. 1), and left with about 2 cm of cambium at the upper cavity. Southern Flying Squirrels (*Glaucomys volans*) then usurped both cavities, but the birds continued to use other trees in the colony.

Two dead Red-cockaded Woodpecker cavity trees found in Noxubee County, Mississippi, and Jefferson County, Alabama, in 1974 and 1977, appeared to have met a similar fate. Both Loblolly Pines were dead when found, and I could not determine whether girdling occurred before or after death. Although neither could be aged, both were small for Red-cockaded Woodpecker cavity trees (dbh 31 and 27 cm). Larger potential cavity trees were not present at either site.

Disease, insects, or crowding may have contributed to the death of the South Carolina tree; but I saw no evidence of such factors, and the ultimate cause of death was likely girdling by the birds. The increased likelihood of girdling in young trees may be a reason for this species' preference for older pines for cavity excavation. Excessive gum flow in younger trees (Jackson 1978) and, possibly, a need for red heart fungus (*Phellinus pini*) damage (Jackson 1977) are among other factors that may also favor choice of older trees for cavity excavation.

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LITERATURE CITED

- Jackson, J.A. 1974. Gray Rat Snakes versus Red-cockaded Woodpeckers: predator-prey adaptations. *Auk* 91:342-347.
- _____. 1977. Red-cockaded Woodpeckers and pine red heart disease. *Auk* 94:160-163.
- _____. 1978. Predation of a Gray Rat Snake on Red-cockaded Woodpecker nestlings. *Bird-Banding* 49:187-188.
- _____, M.R. Lennartz, and R.G. Hooper. 1979. Tree age and cavity initiation by Red-cockaded Woodpeckers. *J. Forestry* 77:102-103.
- _____, and R.L. Thompson. 1971. A glossary of terms used in association with the Red-cockaded Woodpecker. Pages 187-188 in *The Ecology and Management of the Red-cockaded Woodpecker*, R.L. Thompson (editor). Bureau of Sport Fisheries and Wildlife, U.S. Dep. Interior, and Tall Timbers Research Station, Tallahassee, Florida.
- Ligon, J.D. 1970. Behavior and breeding biology of the Red-cockaded Woodpecker. *Auk* 87:255-278.

Wayne, A.T. 1910. Birds of South Carolina. Contributions from The Charleston Museum, I. Charleston.

Status of Three Colonies of Red-cockaded Woodpeckers at Pee Dee National Wildlife Refuge, Anson County, N.C.

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Red-cockaded Woodpeckers (*Picoides borealis*) are scarce in the piedmont of the Carolinas. Several piedmont nesting localities have been reported in recent years, including Pee Dee National Wildlife Refuge in Anson County, N.C. (Potter et al. 1980). The purpose of this paper is to provide information on the status of several colonies at Pee Dee National Wildlife Refuge.

Red-cockaded Woodpeckers are or were inhabiting three colonies. Colonies 1 and 3 are near the junction of SR 1634 and 1627. Colony 2 is near refuge headquarters. All three are in mature mesic pine forest with a well-developed understory and midstory dominated by Sweetgum (*Liquidambar styraciflua*), oaks (*Quercus* sp.), hickories (*Carya* sp.), dogwoods (*Cornus* sp.), and Red Maple (*Acer rubrum*). Colonies 1 and 3 are on land with minimal relief; Colony 2 is on undulating land with a maximum relief of 6 m.

Cavity trees in the three colonies are almost all Loblolly Pines (*Pinus taeda*). The only exceptions are one Longleaf Pine (*P. palustris*) in Colony 1 and one Shortleaf Pine (*P. echinata*) in Colony 2. Diameter at breast height, height, and age of the cavity trees were measured by several foresters directing the Youth Conservation Corps summer program and by refuge personnel. No data were collected prior to 1977; age of the trees is updated to the year 1985. Almost all cavity trees were measured for the three variables. The exceptions are a tree that was dead when discovered in Colony 2 and the 243-year-old Longleaf Pine, which died in 1983 in Colony 1. Diameter, height, and age of the cavity trees (Tables 1-3) generally agree with these measurements from throughout the Red-cockaded Woodpecker's range except in southern Florida (see Table 1 in Shapiro 1983).

Compass directions of cavities and start holes were designated into four compass categories: north (316°-45°), south (136°-225°), east (46°-135°), and west (226°-315°).

TABLE 1. Diameter at breast height (in cm) of Red-cockaded Woodpecker cavity trees at Pee Dee N.W.R., Anson County, N.C.

	COLONY 1 (N = 12)	COLONY 2 (N = 43)	COLONY 3 (N = 10)
mean	49.1	43.2	38.3
S.D.	7.5	7.6	5.9
range	34.5-62.7	29.5-59.4	28.4-46.2