

May 1946. Although Marie Huger has noted an early arrival date of 4 March, Johnston (1964) accepted Heddon's Buck Creek record of 16 April 1946 as the earliest spring date for the species. Toliver Crunkleton has noted extreme dates of 24 April to 1 October 1951 at Buttermilk Level (3,800 feet), but the latest departure record appears to be Huger's observation of 5 October.

Between 16 and 21 June 1969, I searched for Least Flycatchers along all passable roads on the Highlands Plateau; and nine calling males were repeatedly located at sites ranging from 2,900 feet to 3,950 feet in elevation. Individuals were noted at the following locales: two birds were on adjacent territories in Horse Cove (2,900 feet), one was noted at the junction of Route 106 and Turtlepond Road (3,950 feet), two were along Route 106 just W of the Highlands city limits (3,800 feet), two were noted on S.R. 1547 some .3 miles from US 64 (3,760 feet), and single birds were heard along SR 1564 (3,750 feet) and along US 64 just above Dry Falls (3,840 feet). Habitat selection at these nine sites consistently involved mixed, open, second-growth forests of maple, oak, hickory, and pine; and the bird's home range within these woodlands invariably bordered on open areas such as pasture land or orchards. Limitations of time precluded any search for nests, and consequently no evidence of breeding was noted.

ACKNOWLEDGMENTS

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LITERATURE CITED

- Brewster, William. 1886. An ornithological reconnaissance in western North Carolina. *Auk*, 3:94-112, 173-179.
- Johnston, David W. 1964. The birds of Highlands, North Carolina, with a preliminary list from Cashiers and nearby gorges. *J. Elisha Mitchell Sci. Soc.*, 80:29-38.
- Odum, Eugene P. 1949. Small mammals of the Highlands (North Carolina) Plateau. *Jour. Mammal.*, 30:179-192.
- Pearson, T.G., C.S. Brimley, and H.H. Brimley. 1959. *Birds of North Carolina*. Bynum Printing Co., Raleigh.
- Quarterman, Elsie and Catherine Keever. 1947. A summer check list of the vascular plants of the Highlands region. Highlands, Museum Publication No. 6.
- Stevenson, Henry M., Jr. 1941. Summer residents of the Highlands, North Carolina, region. *Oriole*, 6:41-48.
- Torrey, Bradford. 1898. *A world of green hills*. Houghton Mifflin Co., Boston, 285 p.

Breeding Cedar Waxwings In Great Craggy and Black Mountains

MARCUS B. SIMPSON JR.
P. O. Box 167, Statesville, N. C.

MARJORIE ROGERS
HOLLIS J. ROGERS
420 E. Radiance Drive, Greensboro, N.C.

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On 17 June 1970, while exploring portions of the Great Craggy Mountains of Buncombe County, N.C., Simpson noted a pair of Cedar Waxwings (*Bombycilla cedorum*) carrying food into a small, open grove of hawthorns (*Crataegus* sp.) 50 yards S of Beetree Gap (elevation 4,920 feet). Subsequent investigation revealed a loose, bulky nest of twigs and grass at a height of 9½ feet in a 12-foot hawthorn shrub. Examination of the nest revealed four blind, naked young. The two adults, showing no

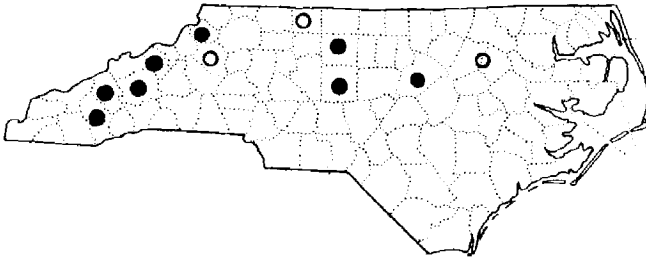


Figure 1. Cedar Waxwing nesting sites in North Carolina.

sign of alarm, were seen repeatedly carrying food to the nestlings. Specimens of the shrub were collected, and S.W. Leonard, curator of the UNC-CH Herbarium, identified the plant as *Crategus punctata* Jacq.

During the previous summer, the Rogers observed a pair of waxwings constructing a nest 20 feet up in a Fraser fir (*Abies fraseri*) on Wilson Ridge in the Black Mountains of Yancey County, N.C. The nest, located at Campsite No. 1 in Mt. Mitchell State Park at an elevation of 6,320 feet, was begun on 20 July 1969 and completed on 26 July. The Rogers noted one egg present on 26 July and two on 27 July, but their subsequent departure precluded any further study of the nest. However, Roberta Grey and Noel Free (pers. com.) watched the adults carrying food and heard the cries of the young at this same nest on 22 through 24 August 1970.

To our knowledge, there are no previously documented nesting records of the Cedar Waxwing from these two mountain ranges. Cairns (1889, 1891) stated that the bird "breeds in June" in these mountains, but he gave no specific details to support this contention. Brewster (1886) noted a pair "apparently about to breed in some spruces bordering a clearing at 5000 feet" during his visit to the Black Mountains in June 1885. Burleigh (1941) reported a pair gathering nesting material on Mt. Mitchell on 10 August 1931 in a clearing at 6,600 feet, but no other breeding evidence was noted during his 5-year study of the area.

It is interesting that the majority of published nest records of the Cedar Waxwing in North Carolina are from the piedmont or low mountain valleys, while the bulk of the population is found above 3,000 feet during most of the breeding season. Positive breeding evidence has been reported from Jackson County (Peake, 1963), Haywood County (Lesley, 1947), Buncombe County (Chambers, 1947), Watauga County (Pearson et al., 1942), Guilford County (Shaftesbury, 1949), Randolph County (Mattocks, 1950), and Wake County (Brimley, 1891). Reports of "nests" but with no details about their contents have been published from Caldwell County (Whitner, 1956), Stokes County (Craft, 1949), and from Rocky Mount (Joyner, 1954). These records are summarized on the distribution map (Fig. 1). Much remains to be learned about the breeding distribution of this bird in the Carolinas, and observers should be alert to document nesting records when possible.

LITERATURE CITED

- BREWSTER, W. 1886. An ornithological reconnaissance in western North Carolina. *Auk*, 3:94-112, 173-179.
- BRIMLEY, C.S. 1891. Nesting of the Cedar Waxwing at Raleigh, North Carolina. *Ornithologist and Oologist*, 16:25.
- BURLEIGH, T.D. 1941. Bird life on Mt. Mitchell. *Auk*, 58:334-345.
- CAIRNS, J.S. 1889. The summer birds of Buncombe County, North Carolina. *Ornithologist and Oologist*, 14:17-23.

- CAIRNS, J.S. 1891. List of the birds of Buncombe County, North Carolina. Privately printed.
- CHAMBERS, O. 1947. Cedar Waxwings nest at Biltmore, N.C. Chat, 11:93.
- CRAFT, W. 1949. Some North Carolina summer records. Chat, 13:33.
- JOYNER, J.W.E. 1954. Cedar Waxwings nesting. Chat, 18:81.
- LESLEY, S. 1947. Cedar Waxwings nest at Lake Junaluska, N.C. Chat, 11:93.
- MATTOCKS, J. 1950. Cedar Waxwings found nesting near High Point, N.C. Chat, 14:61.
- PEAKE, R.H. 1963. Briefs for the file. Chat, 27:82.
- PEARSON, T.G., C.S. BRIMLEY, and H.H. BRIMLEY. 1942. Birds of North Carolina.
- SHAFTESBURY, A.D. 1949. Cedar Waxwing nest in Guilford County, N.C. Chat, 13:76.
- WHITNER, O. 1956. Briefs for the file. Chat, 20:83.

Problem Solving by a Pair of Nesting Starlings

PAUL A. STEWART

Entomology Research Division, Agricultural Research Service, USDA
Oxford, North Carolina 27565

On 24 May 1970, near Oxford, N.C., a pair of Starlings (*Sturnus vulgaris*) was observed carrying food to their 5 or 6 day-old nestlings inside a barn about 8 feet above the ground where a hole had been drilled by a Yellow-shafted Flicker (*Colaptes auratus*). In an effort to get some information on the Starling's problem-solving capability, I attached to the side of the barn a sheet of plywood, 3 feet by 1½ feet, containing 13 holes. The holes were 1¼ inches in diameter, slightly too small for access by the parent birds. A 1-inch board was placed between the plywood and the wall of the barn to enhance the appearance that all holes through the plywood opened into cavities. However, when the face of the plywood was viewed from a right-angle position, the cavity entrance appeared as a dark hole; whereas, the barn wall could be seen through the other holes in the plywood. The parent birds were not marked, and it was thus impossible to relate the observations to individual birds.

Twenty minutes later, after the Starlings had several times flown near the nest entrance and away without alighting, one alighted on the plywood. It examined two holes, one after another, seemingly at random, and then flew away only to circle back to the hole on the extreme left in the upper row of holes. The bird examined the three upper holes, one after another, left to right, and then moved down to the next lower row of holes and examined them, right to left, until the nest entrance was found at the third hole from the extreme right. The Starling making the second visit to the nest, presumably the other bird of the pair, examined only two incorrect holes before going to the correct one. In 18 visits to the nest during the following hour, the Starlings went directly to the correct hole all except four times when one and two incorrect holes were earlier examined.

The plywood sheet was then moved so the nest entrance was aligned with a different hole. Then both returning birds went first to the hole which was formerly the correct one and then examined two and three holes, respectively, before going to the correct one. Thereafter, the birds went directly to the correct hole in all but one of eight visits, and then they examined only one incorrect hole prior to making the correct choice. The plywood was twice later changed so that the nest entrance was aligned with different holes, and the birds flew directly to the correct hole in each of the return visits.

I then changed the position of the plywood and made a second hole in the side of the barn aligned with a hole in the plywood about 8 inches above the one over the nesting hole. In 14 following visits the parent birds went first to the correct hole, and in 12 they went to the incorrect hole. The nestlings were then removed from the nest, and the visiting parents later checked six and nine holes through the plywood, respectively, after