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Long-distance dispersal of an adult Red-cockaded Woodpecker.—The Red-cockaded Woodpecker (*Picoides borealis*) is an endangered species endemic to mature pine forests of the southeastern United States, and is especially characteristic of longleaf pine (*Pinus palustris*) and forest lacking in hardwood understory. Such habitat has grown increasingly sparse and fragmented in recent years, and the remaining populations of the bird are becoming increasingly isolated as a result (USFWS 1985, Ligon et al. 1986, Jackson 1987). As populations become isolated, the possibility of dispersal between them becomes an important issue, particularly in maintenance of genetic variability (Reed et al. 1988). In this note we describe a long-distance dispersal by an adult female Red-cockaded Woodpecker. She moved from an isolated group in the Piedmont of North Carolina to a group, 90 km away, within a large population in the Sandhills. The individual involved was banded with three color bands and a USFWS aluminum band as an adult in 1984. At that time she resided in an isolated group in the Piedmont, near the Shearon Harris nuclear power plant on land owned by Carolina Power and Light Company in southwestern Wake County. In 1984, the female was paired and fledged two young. The pair remained at the site in 1985 and nested again, but the nest failed. During the winter of 1985–1986, the male (banded) disappeared. The female was last observed there on 10 April, 1986, when she was involved in aggressive interaction with one of two unbanded birds that moved into the site. She was absent on 17 April, and from that date on, only the two new birds resided there.

The group at Shearon Harris to which the female belonged is part of a sparse, little known population. In 1981, only four groups could be found in the entire Piedmont of North Carolina, including two in Wake County, and only seven groups in the Coastal Plain counties adjacent to Wake County to the east (Carter et al. 1983a). In 1984–1986, the Shearon Harris group was 50 km from the next nearest known group. During this time, three unbanded Red-cockaded Woodpeckers were observed at Shearon Harris, suggesting that there were some unknown groups remaining in the area. After disappearing from Shearon Harris, the female was next seen 90 km to the southwest on Camp Mackall, a military base in Richmond and Scotland counties in the Sandhills. She was first seen in the Sandhills on 23 May 1986, 43 days after last being seen in Wake County, and was identified from her color-band combination. She was recaptured on 28 May, and her identity was confirmed from her aluminum band number. The minimum rate of movement of the female was 2 km/day, and the actual rate is presumably higher as it is unlikely that we observed her the first day she arrived in the Sandhills. Observers visited the site to which she moved every 9 days during the dispersal period, but no birds were contacted prior to 23 May.

The female was paired with an unbanded male when first observed at Camp Mackall. The pair failed to nest in 1986, and both birds had disappeared by the 1987 breeding season. The large Sandhills population (450 groups), including all the groups on Camp Mackall, has been studied intensively since 1979 (Carter et al. 1983b; Walters et al. 1988). Although not a certainty, it is likely that if the female moved within the Sandhills in 1986–1987, she would have been detected in her new group. Thus the female likely did not reproduce following her dispersal from the Piedmont to the Sandhills.

We suggest the distance of this particular movement was a result of the low density of Red-cockaded Woodpeckers in the vicinity of the female's original group. Within the Sandhills, dispersal distances average longer in areas of low population density (Walters et al. 1988). This female, traveling southwest out of Wake County, may not have encountered other birds until reaching the Sandhills population.

The habitat between Shearon Harris and Camp Mackall is not continuous pine forest. There are areas of pine, but also agricultural fields and hardwood stands. Possibly the bird followed U.S. Highway 1 between the two sites. Although not the shortest route between the two points, the highway is lined with pines much of the distance between Shearon Harris and Camp Mackall, with the notable exception of some sections in and around the city of Sanford. The cavity trees which the female used at Shearon Harris were within 200 m of Highway 1, and those she used in the Sandhills were less than 2 km from Highway 1. Jackson (1976) suggested that rights-of-way along highways in the Southeast be managed to provide habitat corridors for dispersal between isolated populations. Our observation indicates that long distance movements along corridors are possible.

This dispersal, and the additional dispersals of unbanded birds into Shearon Harris, suggest that isolated groups have some potential for persistence, and that genetic exchange between isolated populations via dispersal may be a more reasonable possibility than previously supposed.

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Response of Least Bitterns to tape-recorded calls.—Tape-recorded calls have been used in the study of a variety of bird species. The technique is useful for estimating avian abundance, investigating habitat use or behavior, and in detecting elusive or secretive species (Johnson et al. 1981, Marion et al. 1981). Johnson et al. (1981) noted that the Least Bittern (*Ixobrychus exilis*) was responsive to playback recordings, but application of the technique for this species has not been documented. In the present study, we used tape-recorded calls of Least Bitterns to increase their detection in dense marsh vegetation. Although the study was not specifically designed to evaluate this technique, the data should be useful for planning further studies of this species, which is considered rare, uncertain, or declining, in many regions of the United States (Chandler 1985, Tate 1986, NYSDEC 1987.)

Methods.—Breeding bird censuses were conducted in six tidal freshwater marshes located along the Hudson River in New York State. All study areas included extensive stands of cattail (primarily *Typha angustifolia*) interspersed with varying amounts of river bulrush (*Scirpus fluviatilis*), purple loosestrife (*Lythrum salicaria*), reed (*Phragmites australis*), and tidal open water. In 1986 and 1987, we counted birds on 169, 0.28-ha plots (30-m radius) among the six areas. Only 50 of the plots were sampled in both years. Plot centers were located randomly within each study area and were separated by at least 60 m.

Breeding birds were counted four times in 1986 and five times in 1987. Counts were conducted by two observers during early morning (05:00–10:00 h DST) and evening periods (16:30–21:00 h), between 1 May and 20 June each year, at times with no measurable precipitation or strong winds (greater than approximately 25 km/h). Each plot visit consisted of an approximate 10-min observation period during which tape-recorded calls of Green-backed Heron (*Butorides virescens*), Least Bittern, American Bittern (*Botaurus lentiginosus*), Virginia Rail (*Rallus limicola*), Sora (*Porzana carolina*), and/or Common Moorhen (*Gallinula chloropus*) were broadcast from the center point using portable cassette recorders. Maximum sound pressure 1 m from the source was approximately 90 db. A standardized sequence of alternating calls and silent listening periods, including up to 5 min of Least Bittern calls, was used during each census round. For Least Bittern, we used the "cooing" call (Bent 1926) as recorded on the "Peterson Field Guide to Bird Songs" (Kellogg et al. 1975). This call is generally attributed to the male and may serve a function in courtship (Weller 1961, Palmer 1962). Estimated distance, movement, and time of observation were noted for all Least Bitterns seen or heard within 30 m of a plot center. Sex of individual birds was usually not confirmed. Additional information on study areas and census methods was reported previously (Swift 1987).

Results.—Least Bitterns were observed 73 times on 48 (28%) of the 169 plots. Approx-