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# SHORT COMMUNICATIONS

**Long-distance dispersal of Red-cockaded Woodpeckers.**—Red-cockaded woodpeckers (*Picoides borealis*) are territorial, non-migratory birds that inhabit pine forests of the southeastern United States (Jackson 1971). They may practice two life history strategies. They may remain on their natal area as helper until a breeding vacancy becomes available at that site or nearby, or disperse in search of a breeding vacancy or unoccupied territory (Walters 1990). By remaining as a helper, a male may inherit a territory upon the death of the breeding male. Helpers are typically the sons of the breeding male and may be from one to several years of age (Hooper et al. 1980). Female Red-cockaded woodpeckers almost exclusively disperse from their natal area, while males employ either strategy (Walters 1990). In this note we define dispersal as the movement of a juvenile or helper from its group of origin to the location where it first breeds (Shields 1987) and fledglings are considered to be juveniles at the time of their dispersal.

Seven long-distance dispersal events by adult and juvenile Red-cockaded woodpeckers have been documented in the literature. These movements can be described as intra-population, or more significantly, inter-population which is important for maintaining gene flow among populations. We define an inter-population dispersal as one occurring between populations that have historically been demographically isolated. Maximum intra-population dispersal distances reported for juvenile females and males in the North Carolina Sandhills were 31.5 and 21.1 km, respectively (Walters 1991). In South Carolina, maximum intra-population movements for juvenile females and males were 23.4 km and 22.1 km, respectively, at the Savannah River Site (SRS) (J. Edwards, unpubl. data) and 19.3 km for a juvenile female at Sand Hills State Forest (SSF) (D.P. Ferral, unpubl. data). Intra-population movements for adults have been recorded as 17.1 km for a male in the North Carolina sandhills (Walters 1991), 30.1 km for a male at the SRS (Jackson 1990), and 41.3 km for males in Texas (Lay and Swepston 1973).

Three inter-population dispersal events have been reported: a 73.6 km movement of a juvenile female from a small population (10 groups) in McCurtain County, Oklahoma (John Skeen, pers. comm.) to an equally small population (12 groups) within the Ouachita National Forest in Arkansas (Montague and Bukenhofer 1994; Warren Montague, pers. comm.); 90 km for an adult female in North Carolina that moved from a single isolated group in the North Carolina Piedmont to a large population (450 groups) in the North Carolina Sandhills (Walters et al. 1988); and 66 km for an adult male in Texas that moved from the Angelina National Forest to the Davy Crocket National Forest (R.N. Conner, pers. Comm.).

Here we report on two juvenile Red-cockaded woodpeckers moving even longer distances between populations. On 6 October 1994, we captured an unfamiliar color-banded female at the SSF, Chesterfield County, South Carolina. The capture site was 6.4 km north of the town of Patrick. This bird originated from the Croatan National Forest (CNF) in North Carolina, where it was banded as a nestling on 25 May 1993. It was last observed on the CNF on 11 June 1993 in its natal cluster (Jeff Walters and Jan Goodson, pers. comm.). The banding site was 8 km west of Newport, Carteret County, North Carolina. The distance between banding and capture locations is 287 km and is the longest dispersal recorded for the species (Fig. 1). It paired with a male in April 1995 and fledged two young in June 1995. It is unknown how long the CNF bird had resided at SSF before being recognized. Red-cockaded Woodpeckers at the capture site had successfully nested and fledged young in 1994; however, the breeding pair was not identified. The SSF is a 18,400 ha multiple-use forest containing 46 groups of Red-cockaded Woodpeckers.

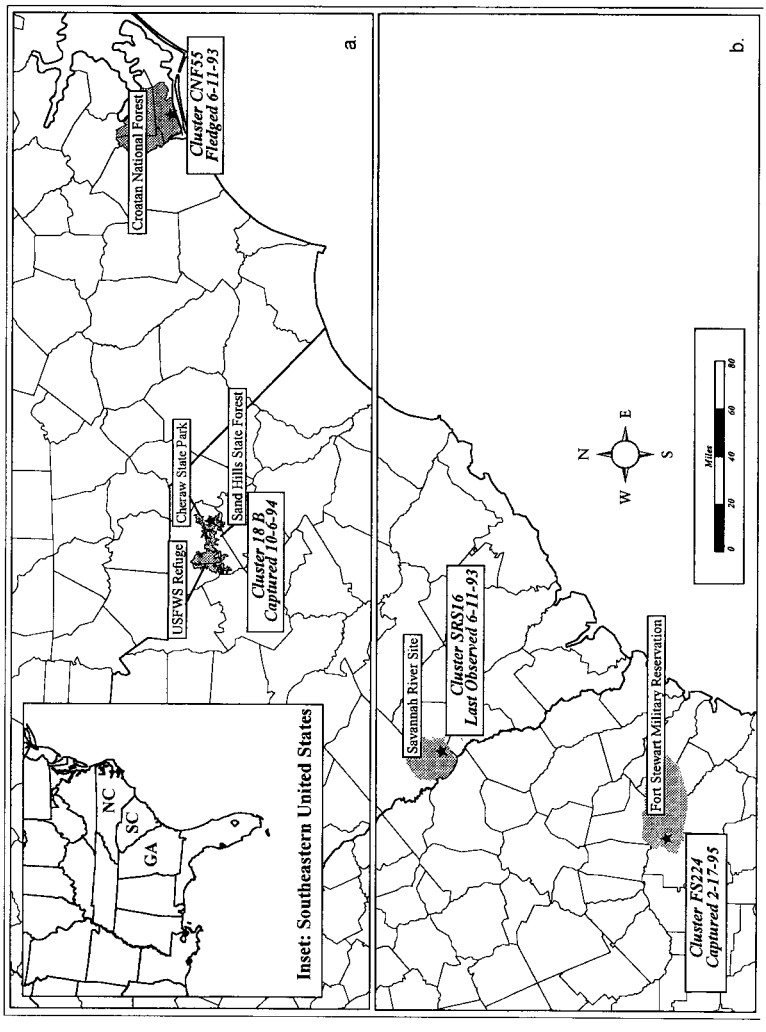


FIG. 1. Two recorded long-distance movements of Red-cockaded Woodpeckers: (a) Two-hundred and eighty-seven km dispersal of a female from the Croatan National Forest, Carteret County, North Carolina to Sand Hills State Forest, Chesterfield County, South Carolina, and (b) One-hundred and sixty km dispersal of a male from the Savannah River Site, Barnwell County, South Carolina, to Fort Stewart Military Reservation, Liberty County, Georgia.

Previous to our report, only one inter-population movement of a male Red-cockaded Woodpeckers had been reported. On 17 February 1995, a male banded as a nestling on the SRS was captured, identified, and released at Fort Stewart Military Reservation, Liberty County, Georgia (Larry Carlisle, pers. comm.). The male fledgling had been banded on 22 May 1992 with a U.S. Fish and Wildlife Service band. It was last observed on the SRS on 11 June 1993 in its natal cluster. It was recovered on 2 February 1995 at Fort Stewart. The distance between banding and capture sites was approximately 160 km (Fig. 1). The bird has not been observed on Fort Stewart since its initial capture.

Dispersal events reported here, and those previously reported, suggest that natural genetic exchanges between geographically isolated populations are more common than previously hypothesized (Walters et al. 1988). Moreover, our ability to document such extreme movements of Red-cockaded woodpeckers results from and demonstrates the utility of long-term banding and monitoring efforts. These findings may also provide new insight into the design and implementation of present and future Red-cockaded Woodpecker translocation programs.

Dispersal between physiographically disparate populations, e.g., from the outer Coastal Plain to the fall line of the Sandhills, demonstrates that dispersers are able to traverse large expanses of unfamiliar habitats. Dispersal events reported by Walters (1990) and Montague and Bukenhofer (1994) are significant in that the birds moved from relatively small to much larger populations, indicating the importance of small, spatially isolated populations. In addition to representing potential genetic variation, these small, isolated populations may also provide temporary stopping points for Red-cockaded Woodpeckers during long-distance movements.

Our findings emphasize that our ability to detect such movements has increased as a result of long-term banding efforts in multiple populations. These interpopulation movements are important in maintaining genetic exchange among Red-cockaded Woodpecker populations.

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**Long-distance dispersal of Red-cockaded Woodpeckers in Texas.**—The Red-cockaded Woodpecker (*Picoides borealis*) is a cooperatively breeding species indigenous to the mature pine forests of the southeastern United States. Continued loss and fragmentation of the mature forests of the South have increased the isolation of extant woodpecker groups throughout the range of this endangered species (USFWS 1985, Conner and Rudolph 1989). Mate replacement following mortality of female and some male breeders is dependent on successful dispersal of young and adult woodpeckers (Walters et al. 1988a). Helper males provide replacements for some male breeders, regardless of cluster isolation.

Dispersal in Red-cockaded Woodpeckers takes two forms, a short-distance form unique to Red-cockaded Woodpeckers, and a longer-distance form like that of other birds (J. R. Walters, pers. commun.). Long-distance dispersal is likely highly sensitive to population density because birds tend to keep moving until they find a breeding vacancy. Isolation of woodpecker groups within a population appears to impair successful short-distance dispersal of woodpeckers and fragmentation of mature pine habitat appears to interfere with successful long-distance dispersal within and between populations to the extent necessary to provide replacement breeders when a member of the breeding pair dies (Conner and Rudolph 1991).

Information on dispersal distances is important in evaluating relationships between cluster isolation and thresholds for successful woodpecker dispersal. Most cases of dispersal involve relatively short distances ($\bar{x}$ = 4.7 km for first-year females, and $\bar{x}$ = 5.4 for first-year males), generally to the closest neighboring woodpecker groups (Walters et al. 1988a). Dispersing adults generally travel shorter distances ($\bar{x}$ = 1.8 km for males and $\bar{x}$ = 2.1 km for females) (Walters et al. 1988a).

Long-distance dispersal that involves movement through nonforest habitat and other possible impediments to dispersal have in the past appeared to be rare, and the paths that Red-cockaded Woodpeckers take through or around such potential barriers are unknown. Walters et al. (1988b) reported a 90 km dispersal by an adult female in North Carolina that included