

## Experimental Reintroduction of Red-cockaded Woodpeckers

D. CRAIG RUDOLPH,\* RICHARD N. CONNER,<sup>1</sup> DAWN K. CARRIE,<sup>2</sup> AND  
RICHARD R. SCHAEFER<sup>1</sup>

<sup>1</sup>Wildlife Habitat and Silviculture Laboratory, Southern Forest Experiment Station,  
USDA Forest Service, Nacogdoches, Texas 75962, USA; and

<sup>2</sup>San Jacinto Ranger District, Sam Houston National Forest, USDA Forest Service,  
308 North Belcher, Cleveland, Texas 77327, USA

The Red-cockaded Woodpecker (*Picoides borealis*) is an endangered species endemic to the pine forests of the southeastern United States (Jackson 1971). Deforestation and habitat alteration have severely affected Red-cockaded Woodpecker populations; current populations are isolated and most are declining (Jackson 1971, Lennartz et al. 1983, Conner and Rudolph 1989, Costa and Escano 1989). The species has been extirpated from significant areas of suitable or potentially suitable habitat.

The cooperative-breeding social structure (Ligon 1970, Walters et al. 1988) and the dependence on the availability of adequate roost and nest cavities (Walters et al. 1992) strongly influence the biology of the species. A direct consequence of this social structure in remnant populations is the demographic collapse resulting from the failure of or extended lag time involved in the natural replacement of breeding individuals. This effect becomes increasingly severe as individual woodpecker groups become more isolated in the declining populations (Conner and Rudolph 1989). Potentially, the recently available techniques of artificial cavity construction (Copeyon 1990, Allen in press) and translocation of first-year adults (DeFazio et al. 1987) have provided managers with the ability to minimize this problem. A major void in management procedures is the current lack of a technique to artificially establish woodpecker groups and populations *de novo*.

Previous efforts to relocate Red-cockaded Woodpecker breeding pairs met with limited success (Odom et al. 1982, Jackson et al. 1983). The recent improvements in cavity-construction techniques and experience in translocating individual birds convinced us that it was time to revisit the issue of the reintroduction of breeding pairs to vacant habitat.

An inactive cluster of cavity trees on the Davy Crockett National Forest in eastern Texas was chosen for the attempt. The site had been inactive for about two years. The site contained two natural cavities. One had a metal restrictor to reduce the enlarged entrance (Carter et al. 1989), and the other was a single artificial cavity (insert type). Cavity competitors, flying squirrels (*Glaucomys volans*) and Red-bellied Woodpeckers (*Melanerpes carolinus*), were removed as necessary before and during the reintroduction. Resin wells were reopened using a wood chisel prior to introduction of the birds.

The chosen site was approximately 3.5 km from the nearest woodpecker group, which consisted of a breeding pair and a helper male. All three birds were color banded, and the helper had joined the pair during the previous six months. The helper male was known to have visited the reintroduction site at least once prior to the reintroduction. Due to the familiarity of this helper male with the site, we elected to use him as the reintroduction male. The reintroduction female was a bird of unknown origin associating with a male/female pair on the Davy Crockett National Forest. Eight additional clans were located within 10 km of the reintroduction site.

Standard translocation techniques (DeFazio et al. 1987) were employed. Briefly, the birds were netted from their roost cavities, transported in mesh cages, and placed in a natural cavity (male) and insert (female) on the night of 17 February 1991. The respective cavity trees were approximately 20 m apart. Wire mesh was tacked over the entrances to contain the birds until dawn. A nylon cord attached to the mesh allowed the birds to be released by a person stationed at the base of each cavity tree. The birds were released simultaneously at dawn on 18 February.

The birds immediately established vocal and visual contact, and remained in the immediate area for approximately 30 min. During this period, vocalizations and following behavior were similar to that which we have come to associate with successful translocations of juvenile birds to an established mate. It started to rain at this time, and we left the site. The two birds returned to the site on the evening of 18 February and roosted in the immediate vicinity, but not in the cavities. The birds were next checked on the evening of 20 February. The female was still present and roosted in the open. The male had returned to his original group and was roosting in his original cavity.

Rather than relocate the male a second time, or depend on his voluntary return, we decided to obtain a second male. During the night of 21 February, we translocated a juvenile male (fledged 28 May 1990) from his natal group on the Angelina National Forest, Texas. The male was released from the introduction cavity shortly after the female became active on the morning of 22 February. Due to the distance (150 m) between the roost site of the female (still roosting in the open) and the introduction cavity for the male,

they did not make contact before the female left the area to forage. On the evening of 22 February, both birds returned to the cluster of cavity trees. Their behavior resembled that of an established pair. They eventually roosted in the open that night.

Due to the reluctance of the birds to use the available cavities, two additional artificial cavities (inserts) were installed on 25 February to provide additional roosting options. On the evening of 28 February, two of the new inserts exhibited signs of use; one and possibly both birds roosted in these inserts.

Subsequent roost checks verified that the two birds continued to roost in the inserts. Behavior appeared normal and, on 18 May 1991, the birds were incubating three eggs in one of the inserts. On 26 May nestlings were being fed. A single male fledged in June. We consider this initial attempt at reintroduction a complete success. In fact, this pair of birds also fledged at least one offspring in 1992.

A number of observations follow from this effort. The choice of a nearby male familiar with the new site and probably more than one year of age may have been a mistake. Combined with the failure of attempts in Texas to translocate a juvenile female to an extra-territorial roosting male in hopes of establishing a new breeding pair, it appears that older helper males may be resistant to this type of manipulation. Also, it is possible that the proximity of the male's prior cavity tree and/or the reluctance of the male to use the available roost cavities may have been factors.

A second successful attempt to reintroduce a pair of Red-cockaded Woodpeckers was carried out on 5 February 1992 on the Sabine National Forest. Both birds used in this attempt were fledged the previous spring, a female from the Angelina National Forest and a male from the Davy Crockett National Forest. The site chosen was an abandoned cluster site with unusable cavities. Two inserts were installed prior to the reintroduction. After release, the birds were not seen at the cluster, but they apparently remained in the area. On 23 April 1992, two inserts were active and the birds were present at the site. Logistical limitations prevented determination of any breeding activity.

The implications of a viable reintroduction technique are apparent. Given a sufficient donor population, such a technique provides the option of reintroducing Red-cockaded Woodpeckers to currently unoccupied habitat once the basic habitat requirements are present. It also provides a method of increasing the viability of existing small populations by the strategic placement of additional breeding units to reduce isolation within these populations (Conner and Rudolph 1989) and, thus, to increase directly the population size. We suggest that donor males be obtained from groups of sufficient size so that at least one potential helper male remains.

Walters et al. (1992) have demonstrated that new groups will become established under certain circum-

stances if artificial cavities are provided. Population size and isolation of sites may influence the success of their technique. In situations where their technique is not feasible, the ability to establish new groups by reintroduction will be of value.

In the case of reintroductions to vacant habitat, we strongly support the use of simultaneous multiple reintroductions. The simultaneous reintroduction of 5 to 10 pairs in a spatial array dense enough to permit social contact of adjacent pairs could immediately result in the establishment of at least a partially functioning population. This could then serve as a nucleus for future population growth by both natural and artificial means.

We thank R. Costa, R. E. F. Escano, J. A. Jackson, J. D. Ligon, and J. R. Walters for reviews of an earlier draft of this manuscript. S. Best and A. Sanchez provided necessary technical assistance.

#### LITERATURE CITED

- ALLEN, D. In press. Technique for installing cavity inserts for Red-cockaded Woodpeckers. Southeast. For. Exp. Stat. Rep.
- CARTER, J. H., III, J. R. WALTERS, S. H. EVERHART, AND P. D. DOERR. 1989. Restrictors for Red-cockaded Woodpecker cavities. *Wildl. Soc. Bull.* 17:68-72.
- CONNER, R. N., AND D. C. RUDOLPH. 1989. Red-cockaded Woodpecker colony status and trends on the Angelina, Davy Crockett, and Sabine National Forests. Res. Pap. SO-250. U.S. Dep. Agric., Forest Serv., Southern Forest Experiment Station, New Orleans.
- COPEYON, C. K. 1990. A technique for constructing cavities for the Red-cockaded Woodpecker. *Wildl. Soc. Bull.* 18:303-311.
- COSTA, R., AND R. E. F. ESCANO. 1989. Red-cockaded Woodpecker: Status and management in the Southern Region in 1986. Tech. Publ. R8-TP 12. U.S. Dep. Agric., Forest Serv., Atlanta.
- DEFAZIO, J. T., M. A. HUNNICUTT, M. R. LENNARTZ, G. L. CHAPMAN, AND J. A. JACKSON. 1987. Red-cockaded Woodpecker translocation experiments in South Carolina. *Proc. Annu. Conf. Southeast. Assoc. Fish Wildl. Agencies* 41:311-317.
- JACKSON, J. A. 1971. The evolution, taxonomy, distribution, past populations and current status of the Red-cockaded Woodpecker. Pages 4-29 in *The ecology and management of the Red-cockaded Woodpecker* (R. L. Thompson, Ed.). Bur. Sport Fish. Wildl., U.S. Dep. Int., and Tall Timbers Research Station, Tallahassee.
- JACKSON, J. A., B. J. SCHARDIEN, AND P. R. MILLER. 1983. Moving Red-cockaded Woodpecker colonies: Relocation or phased destruction. *Wildl. Soc. Bull.* 11:59-62.
- LENNARTZ, M. R., P. H. GEISSLER, R. F. HARLOW, R. C. LONG, K. M. CHITWOOD, AND J. A. JACKSON. 1983. Status of the Red-cockaded Woodpecker on fed-

- eral lands in the South. Pages 7-12 in *Red-cockaded Woodpecker Symposium II. Proceedings* (D. A. Wood, Ed.). Florida Game and Fresh Water Fish Commission, Tallahassee.
- LIGON, J. D. 1970. Behavior and breeding biology of the Red-cockaded Woodpecker. *Auk* 87:255-278.
- ODOM, R. R., J. RAPPOLE, J. EVANS, D. CHARBONNEAU, AND D. PALMER. 1982. Red-cockaded Woodpecker relocation experiment in coastal Georgia. *Wildl. Soc. Bull.* 10:197-203.
- WALTERS, J. R., P. D. DOERR, AND J. H. CARTER, III. 1988. The cooperative breeding system of the Red-cockaded Woodpecker. *Ethology* 78:275-305.
- WALTERS, J. R., III, C. K. COPEYON, AND J. H. CARTER. 1992. A test of the ecological basis of cooperative breeding in Red-cockaded Woodpeckers. *Auk* 109:90-97.

*Received 24 June 1991, accepted 23 February 1992.*