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A Red-cockaded Woodpecker Group with Two Simultaneous Nest Trees

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ABSTRACT.—During a study of Red-cockaded Woodpecker (*Picoides borealis*) nesting in eastern Texas, we discovered a single breeding pair of woodpeckers with two simultaneous nests in nest trees that were 24 m apart. Incubation of eggs in each nest tree was at least 13 d and may have been as long as 16 d. The breeding male incubated and fed a nestling in one nest tree and the breeding female incubated and fed a nestling in the other nest tree until the nestlings were ≥24 d old. Prior to fledging, both the breeding male and female were observed feeding both nestlings in both nest trees. The pair successfully fledged the two nestlings, a single fledging from each nest tree, during one nesting cycle. After the nestlings were fledged, both the male and female woodpeckers were observed feeding both fledglings about 350 m from the pair of nest trees. Our observations indicate that there are exceptions to the current theory that the contribution by the breeding male and female to incubation and feeding of nestlings is essential and that neither the male nor the female can normally rear young birds without the contribution of the other. *Received 2 June 2000, accepted 17 January 2001.*

The Red-cockaded Woodpecker (*Picoides borealis*) is a cooperatively breeding species that typically uses a single cavity for nesting (Ligon 1970, Walters et al. 1988). A single tree, or aggregation of cavity trees, termed the cluster, is inhabited by a group of woodpeckers that includes a single breeding pair and up to several helpers, which are typically male offspring of previous breeding seasons (Ligon 1970, Lennartz et al. 1987). Each group of Red-cockaded Woodpeckers usually produces one nest per breeding season, but will often nest again during the same breeding season if the first nest fails. Double clutching and double brooding (where both nests are successful) are known to occur in Red-cockaded Woodpeckers in the southern and northern portion of the species' range (LaBranche et al. 1994, Franzreb 1997, Phillips et al. 1998). In all previously documented cases of double brooding in Red-cockaded Woodpeckers the second nest was initiated only after young in the first nest had fledged. Among other *Picoides*, Downy Woodpeckers (*P. pubescens*) are known to double brood in the southern U.S., whereas Hairy Woodpeckers (*P. villosus*) are not known to double brood (Bent 1939).

Ligon (1999) suggested that the contribution of each sex of a pair of woodpeckers to incubation and feeding of nestlings is essential and that neither the male nor the female can normally rear young birds without the contribution of the other. He also suggested that because of this, woodpeckers are constrained against the evolution of multinest polygyny and multinest polyandry. Only one instance of plural breeding by Red-cockaded Woodpeckers has been reported (Rossell and Britcher 1994). This instance involved a group of four woodpeckers, a breeding male and female, one helper male, and one unrelated, unbanded female, that simultaneously produced two nests in the same cavity tree cluster. Although two separate clutches were laid in two different nest cavities within the same cavity tree, only the initial nest, presumably laid by the breeding female, was successful. The second nest, discovered seven days after the initial nest, was apparently never incubated as the eggs never hatched (Rossell and Britcher 1994). Owens and Owens (1992) observed a possible case of polygyny in Red-bellied Woodpeckers (*Melanerpes carolinus*) where a male and two females appeared to simultaneously fledge young from two nests in two different nest trees.

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Here we report an instance where a single breeding pair, in the absence of nest helpers, successfully fledged two nestlings from two cavity trees (one nestling per cavity tree) during the same nesting cycle.

We studied Red-cockaded Woodpecker nesting behavior on the Angelina National Forest (31° 15′ N, 94° 15′ W) in eastern Texas during the 1999 breeding season. During routine checks of eggs and nestlings in cavities, we discovered that a group (a color-banded breeding pair) on the northern portion of the forest had two nest trees simultaneously within the same cavity tree cluster. Between 24 April and 18 June 1999 a total of 17 visits were made to this cluster to examine eggs and nestlings in the two nests. We also made early morning visits to the cluster to verify group size on eight days. During six of those mornings (22 May to 10 June), we observed adults feeding nestlings for a 3-h period after the adults left their respective nest cavities to determine which nestlings were fed by each adult woodpecker. To verify fledging success, fledglings and the breeding pair were relocated within their territory on 18 June 1999.

On 24 and 25 April 1999 three eggs were present in a cavity in tree 985-A, suggesting a completed clutch was present because eggs are typically laid on consecutive days until the clutch is complete. However, when the nest cavity was examined on 1 May, five eggs were present. Five eggs were still present on 2, 6, and 7 May. On 7 May we discovered a second nest cavity containing two eggs in a second nest tree (tree 983-A) that was 24 m distant from the initial nest tree. A total of seven eggs were laid in the two nest cavities.

On 11 and 15 May, two eggs were still present in the second nest tree (983-A), and on 17 May one nestling and one egg were present. On 19 May, one nestling and one egg were still present in the second nest tree, and one nestling was detected in the first nest tree (985-A). Examination of the nestlings suggested that the nestling in the first nest tree (985-A) was approximately 2 d older than the nestling in the second nest tree (983-A; see Ligon 1970, 1971). We estimated that the nestling in the first nest tree hatched on 14 May and the nestling in the second nest tree hatched on 16 May.

Observations of the breeding pair indicated that the breeding male incubated eggs and brooded the nestling in the second nest tree (983-A), whereas the breeding female incubated the eggs and brooded the nestling in the initial nest tree (985-A). The breeding male and female woodpeckers were the only adult woodpeckers present in this cluster, and no other adult woodpeckers or helpers were observed in or around the cavity tree cluster prior to, during, or after the nesting season.

Three-hour observation periods of adults feeding nestlings on 22 May, 27 May, 2 June, and 7 June (12 h of observation at each nest) revealed that only the breeding male fed the nestling in the second nest tree, whereas only the breeding female fed the nestling in the initial nest tree. On 9 and 10 June, the male and female were feeding both nestlings in both the initial and second nest trees (6 h of observation at each nest). We do not know the exact day each nestling fledged; the nestling in tree 985A was 28 d old and the nestling in tree 983A was 26 d old on 10 June. By 16 June, both nestlings (two females) had fledged successfully from their respective nest cavities and were observed being fed by the breeding pair on 18 June approximately 350 m east of the two nest trees.

Although we have no direct observation of the breeding male switching roost trees, our field notes of dated events suggest that the breeding male apparently switched roost trees sometime after the initial clutch of three eggs in tree 985-A failed to hatch. After a possible gap in egg laying, the breeding female laid two more eggs in the old nest cavity (tree 985-A), and then laid two additional eggs in the breeding male's new roost cavity (tree 983-A). While laying the four final eggs she may have begun to roost and incubate the eggs in the first nest cavity. A second, less likely alternative is that the breeding female skipped a day when laying eggs in the first nest and completed the first clutch of five eggs in tree 985-A on 27 April, and after a break in egg laying, laid a second clutch of two eggs in the male's new roost tree (tree 983-A). Under this second scenario, the female could have delayed starting incubation of the first nest, or the nest had an extremely long incubation period. Our calculations under the first scenario suggest that incubation of the nests in both cavities was at least 13 d and may have been

as long as 16 d. A single woodpecker apparently did all incubation and brooding duties in each of the nest cavities. At a minimum, this incubation period was likely 2 d longer (and could have been 5 d longer) than the usual 10 to 11-d incubation period (Ligon 1970, Jackson 1994, LaBranche and Walters 1994) when multiple adults share incubation duties.

Our observations are the only known record of a breeding pair of Red-cockaded Woodpeckers, in the absence of helpers, simultaneously using two nests in two different cavity trees to successfully fledge two young woodpeckers. It is likely that the extended incubation period we observed (13–16 vs. 10–11 d) and the slightly longer nestling period (27–29 d vs. 23–26 d) are due to only a single woodpecker doing all the incubation and brooding at each nest. The apparently longer incubation and nestling periods we observed tends to support Ligon's (1999) conclusion that the contribution of both male and female woodpeckers are normally essential for the successful production of fledglings.

Successful Red-cockaded Woodpecker nests in loblolly (*Pinus taeda*)-shortleaf (*P. echinata*) pine habitat on the Angelina National Forest have fledged from 1.8–2.3 young per nest in the past (Schaefer 1996, Conner et al. 1996). During 1999, successful pairs without helpers in loblolly-shortleaf pine habitat (n = 12) in Texas produced an average of 2.08 fledglings per nest (JRM, pers. obs.). The productivity of the two nests in this instance might be considered below average on a "per nest" basis, but when viewed per pair, the woodpeckers successfully fledged two young, which is nearly identical to the average number of young fledged by pairs without helpers during the 1999 breeding season.

Ligon (1999) noted that among woodpeckers, both sexes incubate eggs and provision nestlings with prey that are generally difficult to obtain. In addition, males incubate eggs and brood nestlings during the night, but males do not feed incubating females during the day. These characteristics led Ligon to hypothesize that the essential contribution of each sex during the nesting cycle constrains the evolution of multinest polygyny and multinest polyandry in woodpeckers. We suggest that, by itself, nocturnal incubation by male woodpeckers is not a significant constraint on the evolution of multinest breeding strategies. Female woodpeckers are fully capable of nocturnal incubation and brooding while they roost in a cavity at night, as was the case in our observation. However, the possibly extended incubation and nestling periods do lend support to Ligon's hypothesis that diurnal incubation and brooding, combined with the lack of male provisioning of incubating females, may be ecological constraints.

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