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Red-cockaded Woodpeckers Ensnared in Mesh Snake Traps

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ABSTRACT.—The Red-cockaded Woodpecker (*Picoides borealis*) is a federally endangered cavity nesting species. Mesh snake traps are placed near the base of cavity trees to prevent tree climbing and potential nest predation by rat snakes. In 1997, we documented one live and four dead Red-cockaded Woodpeckers ensnared in mesh snake traps at the Bienville National Forest and Noxubee National Wildlife Refuge, Mississippi. *Received 21 Nove. 1997, accepted 11 June 1998.*

The Red-cockaded Woodpecker (*Picoides borealis*) is a federally endangered species that inhabits mature, open pine forests throughout the southeastern United States (Jackson 1994). Red-cockaded Woodpeckers excavate cavities in live pines for roosting and nesting. Suitable cavity sites are limited (Copeyon et al. 1991), and populations are declining throughout the species' range (James 1995). Intensive management techniques, such as midstory removal, cavity entrance restrictors, artificial cavity inserts, and mesh snake traps have been used to promote recovery of the species (Copeyon 1990, Richardson and Stockie 1995, Raulston et al. 1996). Red-cockaded Woodpeckers create and maintain a sap barrier around entrances to brood cavities, presumably to avoid predation by snakes (Rudolph et al. 1990). However, gray rat snakes (*Elaphe obsoleta spiloides*) remain important predators of Red-cockaded Woodpecker eggs and nestlings (Jackson 1978, Rudolph et al.

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1990). Since Red-cockaded Woodpeckers are an endangered species and continue to decline in most portions of their range, mesh snake traps have been used to prevent rat snakes from climbing cavity trees (Neal et al. 1993).

Bienville National Forest is 72,216 ha of predominantly loblolly pine (*Pinus taeda*) forest in south-central Mississippi. It has 104 active clusters comprising the largest population of Red-cockaded Woodpeckers in Mississippi. The Noxubee National Wildlife Refuge, Noxubee County, Mississippi occupies 19,376 ha and has approximately 35 active Red-cockaded Woodpecker clusters.

The 1.91 cm (3/4") mesh snake traps installed at Bienville National Forest and Noxubee National Wildlife Refuge are placed approximately 1 m above the ground and are similar to designs used elsewhere (Neal et al. 1993). Here, we document the mortality of two Red-cockaded Woodpeckers caused by mesh snake traps on the Bienville National Forest and two others on the Noxubee National Wildlife Refuge.

On 20 April 1997, S. Samano observed a dead Red-cockaded Woodpecker ensnared in a mesh snake trap at Bienville National Forest, Scott County. This bird was caught in a mesh snake trap installed on the brood tree during the 1997 breeding season. The bird was an adult female based on plumage characters and time of year. Only the head and neck of the bird remained in the snake trap. Several contour and flight feathers were found on the ground underneath the trap, but the rest of the bird was not located. Since little decomposition had occurred in the head and neck area, we estimate the bird was caught within several weeks prior to discovery. The specimen was deposited in the ornithological collection in the Biological Sciences Department at Mississippi State University.

On 18 June 1997, D. Wood and M. Taquino discovered a fledged juvenile male Red-cockaded Woodpecker dead in a mesh snake trap on a woodpecker roost tree in the Bienville National Forest. The juvenile bird had been observed alive three days prior to its discovery in the trap. This observation and lack of decomposition suggest the bird was ensnared within two days of discovery. The specimen was deposited in the ornithological collection of the Mississippi Museum of Natural Science.

On 19 June 1997, at the Noxubee National Wildlife Refuge, J. Cole found a live, banded Red-cockaded Woodpecker underneath a mesh snake trap. The mesh snake trap was placed on the tree as part of an ongoing study of rat snake ecology. The fledgling was not caught in the mesh, but was directly below the netting. The bird was removed and placed above the netting, but continued to move back down into the mesh trap. After several attempts, the bird was successfully placed on a different tree and all snake traps in the cluster were removed. The fledgling was 25 days old at the time. Two juveniles from the same clutch had previously fledged successfully and did not become ensnared in the mesh snake trap. The tree on which the fledgling was found was within the cluster but did not have a cavity.

On 24 April 1997, J. Cole found two dead, banded Red-cockaded Woodpecker fledglings caught in a single mesh snake trap on a brood tree at Noxubee National Wildlife Refuge. The fledglings, one male and one female, were approximately 34–35 days old based on band records and partial decomposition. There were no other nestlings in the clutch. In addition to the Red-cockaded Woodpeckers found dead in mesh snake traps, a dead Yellow-bellied Sapsucker (*Sphyrapicus varius*) was caught in a mesh snake trap at Bienville National Forest in the winter of 1996 (D. Elsen, pers. comm.).

The positions of the adult female (Bienville National Forest) and three fledglings (Noxubee National Wildlife Refuge) indicate they entered the snake traps from the base of the trees. The position of the juvenile (Bienville National Forest) suggests that it either landed directly on the trap or became entangled while moving down the tree. Our data suggest that juvenile Red-cockaded Woodpeckers are more susceptible to entanglement because of their poor flight performance and foraging position on trees.

There may be several explanations for how these woodpeckers were caught in the traps. Red-cockaded Woodpeckers exhibit sexual segregation in foraging location on trees. Males forage high in the crown whereas females forage almost exclusively on the trunk more than 1 m from the ground (Ligon 1968). Although Red-cockaded Woodpeckers do not

typically forage at the height of mesh snake skirts, foraging has been recorded within 2 m of the ground (D. Wood, unpubl. data). Instances of drinking from the ground and foraging on fallen slash and slash piles are further examples of activity at low heights (Ligon 1970, Shaefer et al. 1991).

Mesh snake traps are highly successful at capturing rat snakes on Red-cockaded Woodpecker cavity trees (Neal et al. 1993; Richardson and Stockie 1995; D. Wood., unpubl. data). Although these studies indicate a high rate of climbing by rat snakes, we cannot positively assert either that rat snakes would have successfully entered the brood cavity and depredated the nest, or conversely, that the resin barrier would have prevented entrance to the cavity.

Mesh snake traps have led to four known mortalities of Red-cockaded Woodpeckers, one mortality of a Yellow-bellied Sapsucker, and one live capture of a Red-cockaded Woodpecker. In July 1997, the U.S. Fish and Wildlife Service ordered the removal of all mesh snake traps from RCW cavity trees. Instead of mesh skirts, we recommend an alternative, non-lethal method tested by Withgott and coworkers (1995).

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