

Wilson Bull., 101(4), 1989, pp. 644–645

Above-ground nesting by Wild Turkeys.—The Eastern Wild Turkey (*Meleagris gallopavo silvestris*) is a ground nester (Mosby and Handley 1943, Williams 1981). Nest-site selection may vary greatly within and among regional habitat types. In the Southeast, suitable nesting habitat occurs in most forest types (Healy 1981). Successful nest sites are characterized by a rich herbaceous ground layer, a moderately dense woody understory, and relatively open canopy, plus immediately adjacent vertical cover, such as dense vegetation or stumps (Healy 1981, Lazarus and Porter 1985). The combination of these features gives an incubating hen both horizontal and vertical cover, while allowing her field of view to remain partially open. Here we describe aberrant, above-ground nesting by two Wild Turkey hens in coastal North Carolina.

As part of a larger study on the influences of unnatural river flooding on Wild Turkey populations, radio transmitters were placed on 49 hens. Only 19 hens nested, two above ground. The two nest sites were on North Carolina Wildlife Resources Commission and Georgia-Pacific Corporation properties along the Roanoke River in Bertie County, North Carolina. The area is a water tupelo (*Nyssa aquatica*)/bald cypress (*Taxodium distichum*) backswamp which was flooded during alternate years of the study. Nesting chronology and site selection were documented using telemetric locations, and visual observations after 20 days of incubation. The quadrat method (Muller-Dombois and Ellenberg 1974) was used to sample overstory and understory vegetation in 0.04- and 0.004-ha circular plots.

Nest A was in an old-growth tupelo/bald cypress backswamp on a 65.5-cm tall × 79.0-cm wide × 360.0-cm long log which had decayed to form a 37.5-cm trough. The nest depression was 22.0 × 30.2 cm. Incubation of nine eggs was completed on 17 June. Nest B was in the same backswamp habitat on a 56.8-cm diameter × 1.4-m tall bald cypress stump. The nest depression was 29.6 cm in diameter. Incubation of 10 eggs was completed on 1 June. Both hens were adults (> 1 year old), but it was not known whether either hen had nested in previous years. Water tupelo and bald cypress dominated the overstory at site A. The sparse understory consisted of hawthorn (*Crataegus marshallii*) and Carolina ash (*Fraxinus caroliniana*). No herbaceous vegetation was present at site A, although a rich but dissected herbaceous layer occurred within 50 m of site A. Site A was 1.8 m below the high water flood level. Standing water persisted throughout the nesting season. There was no vertical cover beside nest A. Site B had overstory and understory features similar to site A, but in contrast, had a rich herbaceous layer of false nettle (*Boehmeria cylindrica*), lizard's tail (*Saururus cernuus*), and poison ivy (*Toxicodendron radicans*). It was approximately 30 m from the alluvial ridge, the nearest uninundated habitat. When the nest at site B was initiated, the stump was completely surrounded by water. At the completion of incubation, water surrounded only 25% of the stump. Site B was 0.1 m above the high water flood level.

Nesting on elevated objects by Wild Turkeys is unusual. The nest-site selection observed in these two instances may have been random occurrences. It is interesting to note, however, that both individuals were adults with probably at least one year's nesting experience and flood exposure in the preceding year. With "typical" nesting habitat in close proximity to both nests, there should have been an anti-predatory advantage to nesting in an area with a rich herbaceous layer giving the maximum amount of cover at the ground layer. However, both hens had the advantage of being above the field of view of most ground predators, and of choosing a site at which nest destruction from flooding could not have occurred until flood waters reached a depth of approximately 79.0 and 130.0 cm for sites A and B, respectively.

Acknowledgments.—This work was funded by the North Carolina Wildlife Resources

Commission under Pittman-Robertson Project W-57-R, National Wild Turkey Federation, North Carolina Wild Turkey Federation, and National Rifle Association. J. V. Edwards and J. C. Peoples assisted locating nests, and sampling vegetation. We thank R. B. Frederick, G. A. Hurst, J. E. Kennamer, R. A. Lancia, R. A. Powell, and D. K. Woodward for helpful comments on early drafts of the manuscript. This is paper 12216 of the journal series of the North Carolina Agricultural Research Service, Raleigh, N.C. 27695.

LITERATURE CITED

- HEALY, W. M. 1981. Habitat requirements of Wild Turkeys in the southeastern mountains. Pp. 24–34 in Proc. symp. habitat requirements and habitat management for the Wild Turkey in the southeast (P. E. Bromley and R. L. Carlson, eds.). Va. Wild Turkey Fed., Richmond, Virginia.
- LAZARUS, J. E. AND W. F. PORTER. 1985. Nest habitat selection by Wild Turkeys in Minnesota. Proc. Natl. Wild Turkey Symp. 5:67–81.
- MOSBY, H. S. AND C. O. HANDLEY. 1943. The Wild Turkey in Virginia: its status, life history and management. Va. Comm. Game Inland Fish., Richmond, Virginia.
- MULLER-DOMBOIS, D. AND H. ELLENBERG. 1974. Aims and methods of vegetation ecology. John Wiley and Sons, New York, New York.
- WILLIAMS, L. E. 1981. The book of the Wild Turkey. Winchester Press, Tulsa, Oklahoma.

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Wilson Bull., 101(4), 1989, pp. 645–648

Dead-leaf-searching by the Orange-crowned Warbler in Louisiana in winter.—Searching for arthropods in dead leaves caught in vegetation above ground is a foraging behavior used heavily by many Neotropical and some North American bird species, the latter mainly on their Neotropical wintering grounds (Remsen and Parker 1984 and references therein; Greenberg 1987; Rosenberg, in press). Such dead-leaf-searching has been reported for four species in the wood-warbler (Parulinae) genus *Vermivora* (Golden-winged Warbler, *V. chrysoptera*; Blue-winged Warbler, *V. pinus*; Bachman's Warbler, *V. bachmanii*, and Orange-crowned Warbler, *V. celata*; Ficken and Ficken 1968 and references therein; other references in Remsen and Parker 1984; Greenberg 1987). Although the degree to which these species of *Vermivora* specialize on this foraging behavior is generally unknown, Greenberg (1987) found that in winter the Blue-winged Warbler searched dead leaves in 40% of 75 foraging maneuvers, and K. V. Rosenberg (in litt.) found that in winter in Costa Rica the Golden-winged Warbler searched dead leaves in 82% of 22 foraging maneuvers. In general, the *Vermivora* warblers frequently use probing and gaping motions to investigate curled green leaves, leaf clusters, leaf buds, flowers, bark crevices, moss, and sap wells made by *Sphyrapicus* sapsuckers (Root 1967, Ficken and Ficken 1968, Ehrlich and Daily 1988); the more acute, icterid-like bill of most *Vermivora* species relative to most other wood-warblers presumably reflects adaptation for such probing and gaping movements.

Remsen's initial observations of Orange-crowned Warblers wintering in south-central Louisiana indicated that this species searches dead leaves more frequently than any other