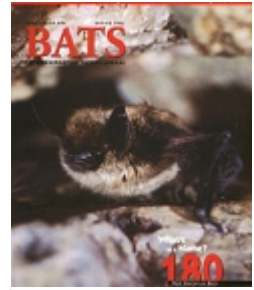



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Tracking Woodland Bats
Weyerhaeuser Studies Bats in Commercial Forests
Darren A. Miller



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Leslie gently clipped the fur between the shoulder blades of a nervous female red bat. After exposing a small patch of skin, she applied a dab of surgical glue and snugged down a radio transmitter smaller than a shirt button. Then we wrapped the bat in a soft cloth and let it rest for about 20 minutes. When we were sure the bat was fully recovered and the radio transmitter firmly attached, we released her to fly off into the forest night. Thus was the little bat dispatched on her scientific mission.

The scene was repeated 46 times in the hot, humid summer nights of eastern Mississippi during 2000 and 2001. Leslie Welch, a graduate student at Mississippi State University, was studying how eastern red bats (*Lasiurus borealis*) adapt to managed pine forests.

Most research on America's forest-dwelling bats has involved older, unmanaged woodlands, but many of the nation's forests now are commercially managed, with different environments than those found in older woods.

This research, supported by Weyerhaeuser Company, BCI, and others, is designed to learn how well bats adapt to managed forests, and how those forests can best be managed for both timber and bats. Welch's work was guided by Francisco Vilella of the Cooperative Fish and Wildlife Research Unit in MSU's Department of Wildlife and Fisheries, and me, Weyerhaeuser's Southern Wildlife Program Manager.

Similar scenes were repeated last summer (and will be again this year), but this time the student is Adam Miles of the University of Georgia, the forests are in southwest Georgia, and we are radiotagging evening bats (*Nycticeius humeralis*). Principal investigators of this continuing program are myself, Steven Castleberry of the University of Georgia, and Mike Conner of the Joseph W. Jones Ecological Research Center.

When I joined Weyerhaeuser as a wildlife biologist about five years ago, virtually nothing was known about bat ecology within managed pine forests of the southeastern United States, although bats are obviously an important component of forest ecosystems. I decided to start collecting basic data on bats and spent several years catching them.

This work documented six species of bats: eastern red bat, Seminole bat (*Lasiurus seminolus*), hoary bat (*Lasiurus cinereus*), southeastern myotis (*Myotis austroriparius*), evening bat, and eastern pipistrelle (*Pipistrellus subflavus*) in our managed forests of eastern Mississippi. More than 80 percent of female bats that found their way into my mist nets were lactating, an indication of successful reproduction.

The research, although encouraging, just scratched the surface. We still needed to examine the detailed ecology of specific bat species, and the eastern red bat was the most abundant species I had encountered. Despite its wide range, surprisingly little is known of the species' complex role in the forest environment. I joined forces with Vilella, we hired Welch, and the red bat project was born.

By putting radio transmitters on red bats ('Wildlife Radio,' page 10), we could document where they were roosting, what habitats they were using, and the size of their foraging area – at least for the 10- to 14-day life of the transmitter.

Previous work had found that these foliage-roosting bats prefer large hardwood trees, which, in industrial pine forests, occur primarily within streamside management zones (bands of mostly mature hardwoods maintained along either side of a stream). Concerns that this preference might limit red bat populations in managed pine forests became a focus of our research.

But when we tracked 27 radiotagged red bats to 141 different roost trees, we found them to be less fastidious in roost selection than expected. Red bats roosted in 17 different species of trees – including pines, which were used at least once by 18 of the bats. The trees ranged in size from just over an inch (2.5 centimeters) in diameter to more than 32 inches (81 centimeters).

These roost trees were primarily in thinned loblolly pine plantations at least 18 years old, but they also used roosts in other habitat types, including the streamside management zones. Red bats, like most foliage-roosting bats, change roosts frequently. In our study, individual bats used one to 12 roosts (with an average of about six) during the approximately two weeks they were being tracked.

Thirty percent of all roosts were loblolly pines (67 percent of roosts used by juvenile females, 25 percent for juvenile males, 18 percent for adult males and 15 percent for adult females).

The average home range of the red bats varied by gender and age, with adult males covering 363 acres (147 hectares) and adult females 203 acres (82 hectares). Juvenile males foraged over 155 acres (63 hectares), while female juveniles used 304 acres (123 hectares) during the tracking period.

We also examined habitat preferences, classifying the Mississippi forests into pine clearcut, closed canopy pine, open canopy pine, and young (less than 50 years) or old hardwood habitat. We found the bats in our study showed no particular preference and were apparently able to forage successfully without concentrating on specific habitats.

Our overall results, like those of other researchers, demonstrate that red bats can exist in a wide variety of forest types and apparently find suitable habitats in industrial pine forests.

In Georgia, we shifted focus to evening bats, which like to roost under loose bark and in dead trees. Large, dead trees, however, are not usually common within short-rotation forests (in which fast-growing trees are harvested and replanted every 30 years or so), which are typical of forest industry land in the South.

We chose two quite different sites for this study. One was a Weyerhaeuser forest of loblolly pine; the other was on the Joseph W. Jones Ecological Research Center, which is dominated by longleaf pine – the native forest of southwest Georgia and one of the most endangered ecosystems in the world.

During the first field season of this two-year project, we radiotagged 53 evening bats and tracked them to 89 roost trees. Pines were the most frequently used trees, at 69 percent, in both areas. In the Jones Center forest, females used snags more often than males, although

snag use was similar for both males and females on Weyerhaeuser land.

Of particular interest is a colony of about 490 evening bats we found roosting in a large longleaf pine snag in the Jones forest. We hope this year's roost data will help clarify differences in roost ecology between these two forest types.

In addition to documenting evening bat roost sites in the two forest types, we also are using mist-net surveys and monitoring bat echolocation calls to study bat community structure. We are just beginning to understand habitat needs of bats within Southern forests, particularly in managed pine forests. Continuing research should provide some of the knowledge that managers need to effectively incorporate bats into their forest-management plans.

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All articles in this issue:

- [What's in a Name?](#)
- [The Bats of Israel](#)
- [Tracking Woodland Bats](#)
- [The Vampire's Gift](#)
- [A Children's Crusade](#)
- [Bats Lose an Old Friend](#)
- [BCI Earns Top Rating Among Nonprofits](#)