Attaching Paper Nest Boxes to Fast-growing Trees

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INTRODUCTION

Paper nest boxes were introduced a number of years ago by Fleming and Petit (1986). The advantage of paper boxes in research projects is primarily cost–only about 20 cents each (for materials)–and they are simple to construct. These boxes are used primarily by researchers who deploy a large number of these easily built, easily transported, and easily accessed nest boxes. The downside is that unless protected from the elements, they have a short life span, about two years.

As part of a research project in Mississippi, we used plastic-coated paperboard nest boxes attached with plastic strapping tape to trunks of intensively managed cottonwood trees. To our surprise, within one year 76% of the nest boxes were unusable by breeding birds because they were crushed between the strapping tape and the tree. Thus, we devised an alternative method of attachment that eliminated crushed boxes.

In the Mississippi Alluvial Valley, as in many other ecosystems, intensively managed hardwood plantations grown for pulpwood can be harvested in as little as 10 years. Typically, these short-rotation forests have few tree cavities and, consequently, few cavity-nesting bird species (Newton 1994, Twedt et al. 1999). Even so, many cavity-nesting species use these early successional forests to forage and, when natural cavities are available, to breed. As part of a study on the feasibility of increasing the densities of cavity-nesting birds through the provision of artificial cavities, we placed nest boxes in managed cottonwood forests and evaluated their use and durability (Twedt and Henne-Kerr 2001).

METHODS

During February 1997, we attached 10 paper nest cavity boxes to trees in each of eight managed cottonwood plantations on Fitler Managed Forest, Issaquena Co., Mississippi. Paper nest boxes (4 x 4 x 8 in [10 x 10 x 20 cm]) were constructed of plastic-coated paperboard orange juice cartons (half gallon) with 1.5 in [3.8 cm] diameter entrance holes. We attached boxes to tree trunks using strapping tape, as suggested by Fleming and Petit (1986). All boxes were attached to cottonwood trees that were planted at 12 x 12 ft [3.6 x 3.6 m] spacing. These trees ranged in age from three years to nine years old. Growth of cottonwood trees in the rich alluvial soils of the Mississippi River is rapid and trees at this study site averaged 10 ft [3 m] per year vertical growth and about 1 in [2.5 cm] per year increase in diameter.

Box occupancy and condition were assessed by monitoring boxes from April though July in 1997 and 1998. During each visit we assessed and recorded the box's physical condition as good (intact and usable), fair (damaged or dilapidated but still usable), or unusable (destroyed or dilapidated beyond use).

RESULTS AND DISCUSSION

During the first year, Carolina Chickadees, Carolina Wrens, Eastern Bluebirds, and Prothonotary Warblers nested in 17 of the 80 paper nest boxes. However, by July many paper boxes were becoming constricted from the strapping tape: four boxes were unusable and 20 boxes (25%) were in fair condition. Increased tree girth during the remainder of the growing season increased the number of crushed boxes. Although 10 boxes were destroyed during timber harvest, by April 1998, 53 (76%) of the 70 remaining boxes were unusable by

birds. Of the 17 boxes that remained usable, 14 were in fair condition due to crushing.

Because of this high box failure rate, we replaced all paper nest boxes during April 1998 with the 10 boxes lost during timber harvest placed in a different stand. However, all replaced nest boxes were subsequently attached using an alternative attachment method which used 3 in [7.6 cm] long aluminum nails inserted through a pre-drilled, 3/4 in [3.8 cm] thick, wooden block (about 1.5 in [7.6 cm] square). Nails were driven through the back of the paper box into the tree trunk by hammering through the box's entrance hole and, when needed, by using a flat ended punch to complete nailing. The wooden block, which we found had to be pre-drilled to prevent the block from splitting, served as a support washer to hold the nest box against the tree. It is critical that the nails used are aluminum, because harder nails (e.g., iron or steel) will damage saws and chippers used to process logs after timber harvest.

Of the 80 boxes attached by this alternative attachment method, 22 were used by breeding birds during the 1998 breeding season. Because tape was not used, no boxes failed from constriction. By July 1998, 73 (91%) boxes remained usable and all but two of these boxes were classified in good condition. Eight boxes were again lost to timber harvest during winter; but by March 1999, 62 of 72 boxes (86%) remained usable by breeding birds.

Unfortunately, boxes attached using this alternative method may be more likely to be detached from trees. Of the 10 box failures that occurred during 1998, five were the result of boxes being torn from their mooring. Despite a less secure attachment to the tree trunk, we recommend this alternative method for attaching paperboard nest boxes to fast-growing trees because of the improved longevity.

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