FWRC
RESEARCH ADVANCES
Forest & Wildlife Research Center
February, 1998 • Volume 3, No. 1

A NEW NEST BOX FOR WOOD DUCKS

Fig. 1. Mississippi wood ducks.

WOOD DUCKS

The wood duck is Mississippi's state duck (Fig. I). This denizen of the swamps lives year around in the Magnolia State. However, Mississippi's forested wetlands also provide important habitats for wood ducks which migrate to escape winter at northern latitudes and to feast on acorns and invertebrates in our state's hardwood bottomlands.

Besides being one of the most beautiful ducks in North America, wood ducks also are important game birds. They are usually first or second in the harvest of all ducks in the Mississippi and Atlantic Flyways, which is the primary range of the wood duck on this continent. Indeed, wood ducks contribute significantly to the economy derived from waterfowl hunting in Mississippi and these two flyways.

Wood ducks are cavity nesting ducks, meaning they nest in holes of trees (created by woodpeckers and/or by natural decay after limb breakage) and artificial boxes constructed and maintained by wildlife managers. Nest boxes, which are usually made of wood, have been used widely for over 60 years to establish and increase wood duck populations throughout the United States and Canada. It is believed that nest boxes are especially important for wood duck production in Mississippi and other southeastern states because suitable natural cavities are scarce.

Due in part to the scarcity of natural cavities and nest boxes in many areas, several hens may lay their eggs in a single cavity or box, resulting in "dump nests." These are aggregations of eggs larger than the normal clutch size of about I5 eggs. Wildlife scientists in the Forest and Wildlife Research Center at Mississippi State University have found over 75 eggs in a nest box. Extraordinary numbers of eggs in nest boxes can decrease wood duck productivity, because hens cannot effectively incubate and hatch such large clutches.

Therefore. the scientists reasoned that a smaller nest box, which wouldn't

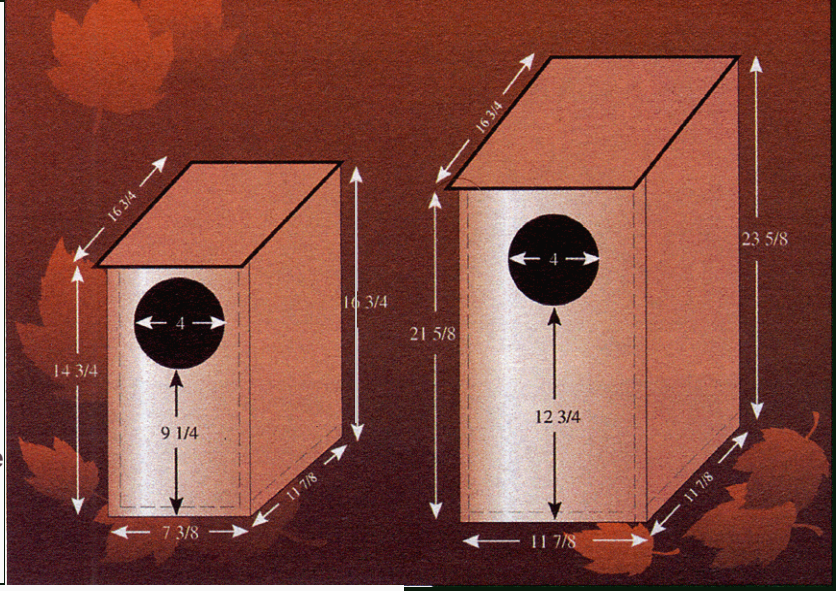

Fig. 2. New nest box (left) and conventional large box. Dimensions each are in inch

accommodate as many eggs, might be a partial solution to any negative effects of dump nesting. The scientists designed a new nest box approximately half the size of conventional duck boxes (Fig. 2). The design was based on the size of box needed to accommodate an incubating hen and a normal size clutch atop 3-4 inches of wood shavings as nest material. The scientists predicted that the new design would decrease numbers of eggs laid in the small box, and perhaps improve hatching success and decrease numbers of unhatched eggs left behind.

The scientists placed equal numbers of the conventional large and the new small nest boxes in wetlands at Noxubee and Yazoo National Wildlife Refuges (Mississippi) and compared wood duck use and production between the two types of boxes in I994 and 1995. One box of either type was randomly assigned and attached to a 4 x 4 inch, treated wooden post equipped with a galvanized circular predator shield 30 inches in diameter (Fig. 3).

Significant results from the study are summarized in Table I . The researchers found: I. more large than small boxes were used by nesting hens, 2. more eggs were laid in large than small boxes, 3. more ducklings exited large than small boxes, and 4. more dump nests occurred in large boxes. However, nesting success did not differ between large and small boxes. Importantly, ducklings were produced more economically from small than large boxes because small structures were less expensive to construct. The scientists concluded that the small nest box offers wildlife managers an alternative structure, which I provides a suitable nesting environment for wood ducks or hooded mergansers, 2. is more cost-effective for duckling production than the large box, and 3. is easier to install because of its light weight.

Nest boxes should be constructed of weather-resistant lumber (e.g., cypress, tupelo, cedar) to enhance longevity of the box and benefit: cost ratios. Rough-cut pine can be used and its life increased by treating the exterior of the box with a clear wood preservative; however, painting boxes is not recommended because wood ducks may prefer a natural exterior that blends with tree bark. If rough-cut lumber is used to construct boxes, it is not necessary to attach a "screen ladder" to the interior of boxes to facilitate the ducklings' exit. With long, clinging toenails, ducklings can easily scale the inside wall of boxes toward the exit hole without the aid of a ladder. However, it may be advisable to roughen the interior wood surface of the box from the bottom of the box to the hole with a file or knife to give the ducklings a "toe-hold" during their exodus.

Dry-wall screws function better than nails to hold sides of boxes together amid Mississippi's variable climate. The roof of boxes should be hinged to the top rear to enable entry by managers for the purposes of cleaning and maintenance, as well as monitoring wood duck use and production. Additionally, the roof can be locked to either side of the box with a screen door eye-hook.

Fig. 3. Wood duck box port with predator shield

VARIABLE	Small Nest Box	Large Nest Box
Use by nesting wood ducks	71%	87%
Number of eggs	12	15
Dump nesting	41%	58%
Nest success	59%	66%
Wood duck ducklings/box/year	7.3	9.4
Cost/wood duck duckling	$ 1.92	$ 2.02
Cost/duckling (wood duck and hooded merganser combined)	$ 1.57	$ 1.82

Note: Values in table calculated from Stephens et al. (1998).

Table 1: Average values of selected variables measured pertaining to wood duck nesting in large and small nest boxes at Noxubee and Yazoo National Wildlife Refuges, Mississippi, 1994-1995.

For people trying to increase benefit: cost ratios they may consider attaching two small boxes, front and back, to the 4 x 4-inch posts, but one box per post is probably best. Boxes should never be attached to posts without a predator shield; the latter should be attached tightly to the post a minimum of 2-3 feet below the bottom of nest boxes to prevent snakes and other predators from stretching across the gap between the post and the shield and thereby gaining access to the nest. Boxes attached to trees also should have some type of predator exclusion device, such as aluminum flashing material at least 2-3 feet in width wrapped around the tree below the box. Height of box above ground does not seem critical to use by nesting wood ducks. More importantly, however, boxes should be placed at heights to enable efficient and effective maintenance and box checks by managers, and both boxes and predator shields should be placed above maximum high water level to prevent inundation of boxes during floods and access by predators, such as raccoons and snakes. Interestingly, the scientists also have experienced beavers swimming to partially submersed nest boxes and these animals gnawing on the boxes and the posts despite the latter being chemically treated.

Box clean-outs and maintenance of boxes should be performed at least annually, but no later than early-mid winter because wood ducks begin nesting as early as late January in southern United States. If data on wood duck production are desired, it is preferable to check boxes soon after each nest is completed and before evidence of successful nesting (i.e., egg shell membranes) deteriorates or disappears. The scientists prefer to remove unhatched eggs and downy feathers after each nesting attempt to increase subsequent use by nesting ducks or other birds (e.g., flycatchers, blue birds, kestrels).

Although the nest-box study was not intended to examine wood duck duckling survival after departure of the hen and brood from nest boxes (Fig. 4). research is underway by the scientists to estimate survival of brood hens and ducklings, both marked with radiotransmitters. The goal of this research is to identify habitats where nest boxes should be placed to maximize survival of the hen and her brood after hatching. Although this study will not be completed until the year 2000, a preliminary recommendation is to scatter boxes amidst trees or shrubs (e.g., bottomland hardwoods, cypress, tupelo, willows, buttonbush) standing in water, so ducklings can easily swim away with the hen after their exodus from the box. Boxes should be placed away from limbs of trees/shrubs to prevent predators from using the vegetation to access the boxes (Fig. 5) and overhanging vegetation that grows near boxes should be removed periodically. Boxes should never be placed on dry land; predators, such as bobcats, can jump on a box and capture a nesting hen. Finally, largemouth bass and other fish prey on ducklings, so combining bass pond and wood duck management may not be a good idea. Indeed, fish may foul your waterfowl plan!

fg 4 Wood duck ducklings exiting a nest box

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FWRC-WF-77

Fig. 5. Wood ducks inspecting nest boxes in open habitats.

ACKNOWLEDGMENTS

Sponsors of the wood duck research referenced herein include Anderson-Tully Company, the Delta Waterfowl Foundation through the Delta Waterfowl and Wetlands Research Station, Ducks Unlimited's Institute for Wetland and Waterfowl Research, Federal Aid in Wildlife Restoration through the Mississippi Department of Wildlife, Fisheries and Parks, the Forest and Wildlife Research Center (Mississippi State University), the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the U.S. Geological Survey (Biological Resources Division), and the Welder Wildlife Foundation. Wood duck photos by David McEwen, Starkville, MS.

Suggested Reading

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