

TREES FOR WILDLIFE

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Tennessee is blessed with an abundance of forest land which provides a diversity of wildlife habitat. These habitats are composed of numerous grasses, vines, herbs, shrubs and trees. Many species of wildlife depend on certain species or types of trees and shrubs. Wildlife use trees as a food source (fruit, bark, leaves), as winter cover, for nesting, as perches and other uses. In this publication, the authors describe management practices for Tennessee landowners to consider when managing their woodlots for wildlife and timber.

WHAT IS A WILDLIFE TREE?

There are various definitions of a wildlife tree. In this publication, a wildlife tree is defined as being one that has value for wildlife for nesting, cover, perching or food production. This definition includes **den trees**, **mast-producing trees** and **snag (dead) trees**.

THE IDEAL WILDLIFE TREE

An Extension wildlife specialist once identified what he considered the ideal wildlife tree in a timber production situation. The tree was an 18-inch DBH (diameter at breast height) blackgum, was producing a large crop of berries, had a large hole high on the main stem (was mostly hollow) and had a very narrow crown that was taking up little valuable growing space. Although not valuable for sawtimber, this tree was a great wildlife tree! Ideal trees such as these may not be present in every woodlot, but when they are present, they should

DEN TREES

Den trees are live trees that contain holes or hollows large enough to shelter wildlife. Woodpeckers are credited with creating many nesting cavities in trees. Species which create these holes are called primary excavators; species such as owls, wood ducks and raccoons which use cavities created by other animals are called secondary excavators. Other mammals which typically use den trees are gray and fox squirrels, flying squirrels, opossums and black bears. Birds which use tree dens include owls, woodpeckers, bluebirds and swallows. Estimates suggest there are about 32 cavity-nesting bird species that use den trees in Tennessee. In Missouri, research has found that 89 species of wildlife use den trees and another 66 species use snags (see page 7 for discussion of snags) for feeding and perching.

The number of den trees needed in an area is dependent on surrounding conditions and landowner objectives. If, for example, the primary objective is timber production, one or two den trees per acre for wildlife may be sufficient. If the primary objective, however, is to maximize squirrel production, a landowner should leave more den trees, rather than remove them in a timber stand improvement cutting. Also, for some species, artificial nesting structures can be constructed to supplement a shortage of suitable den

trees. In a young timber stand with few or no den trees, for example, gray squirrel numbers may be doubled by erecting 2-3 nesting boxes per acre. Contact your local Tennessee Wildlife Resources Agency officer or Agricultural Extension agent to obtain plans for these structures.

Fallen trees also have value for wildlife. Hollow logs provide refuge or denning opportunities to many wildlife species including shrews, mice, chipmunks, groundhogs, bears, skunks, opossums and some furbearers. During strong wind storms, trees are often uprooted. The resulting root-caps and disturbed soil also provide den sites for groundhogs, foxes, raccoons and others.

MAST-PRODUCING TREES

Mast is an important diet component of many wildlife species. Mast is the fruit of a tree or a shrub and is called "hard" (acorns, hickory nuts, walnuts, etc.) or "soft" (fleshy fruits of dogwood, blackgum, black cherry, etc.). Some of the most important trees and shrubs that produce mast in Tennessee are the oaks, dogwoods, hickories, black cherry, blackgum, beech and maples. The oaks are probably the single most important group of trees for mast production for wildlife. For squirrels, bears, wild hogs and to a lesser extent deer, oak mast appears to be the most important factor influencing reproduction. Following years of good mast production, reproduction, survival and population levels of these wildlife species are high.

Conversely, when mast failures occur, reproduction, survival and population levels of these wildlife

species decline. Oak mast is also highly utilized by wild turkeys, ruffed grouse, bobwhite quail, raccoons and small rodents. Landowners should strive to maintain a variety of mast-producing trees in their woodlots to insure that food is available the entire year.

If possible, landowners should maintain trees from both the white oak and the red oak families in a forest stand because of differences in their fruiting habits. Acorns on trees in the red oak group mature in two years, while trees in the white oak group produce mature acorns in one season. By having both oak groups represented in a woodlot, there is less chance of a complete mast failure following a late killing frost in the spring. Common species in the white oak group include white oak, post oak and chestnut oak; common species in the red oak group include northern red oak, southern red oak, scarlet oak and black oak.

In addition to the oaks, it is important to plan for a diversity of other mast-producing species in the woodlot. Hickories are used extensively by squirrels and dogwood, black cherry, blackgum and wild grape are good soft mast producers. A scattering or clumps of pine provide good cover for wildlife, particularly in winter, and offer an alternate food source (pine seed). Pine also provides a valuable timber component to the timber stand.

Mast production depends on several factors, including tree species, environmental conditions, tree age and vigor. Landowners can often point out individual trees that are the best mast producers in the woodlot. If you have not observed this in your woodlot, look for some clues when

selecting wildlife trees. An abundance of new or old acorns or hickory nut shells under larger trees might indicate the best producers. Temporarily mark these trees and observe their mast production for a few years to see if you are correct in your assessment; then mark the trees permanently as wildlife trees and save them.

The number of mast trees to maintain in a woodlot depends on surrounding conditions and landowner objectives. If wildlife management is the primary objective, more mast trees should be maintained than if the primary objective is timber production. In timber production areas where a complete harvesting system (clearcutting) is used, leave buffer strips along creeks and streams, as well as a few small groups of trees scattered throughout the area. Harvesting timber in smaller tracts (5-40 acres depending on the land base) will maintain adequate mast production. In general, two to three trees (larger than 12 inches DBH) in the white and red oak groups should be left per acre for good mast production for wildlife. Appendix A outlines procedures for estimating the "acorn potential" of a woodlot. Reference this section when evaluating your woodlot for mast trees.

In addition to oaks, one or two hickories and soft mast-producing trees, such as blackgum or black cherry, should also be left per acre to maximize use of the area by a variety of wildlife species.

SNAGS

Snags are dead trees at least 6 inches DBH and 10 feet tall, with little or no timber value. With the possible exception of firewood, they cannot be utilized. However, snags can be extremely valuable as feeding, perching and nesting sites for numerous species of wildlife, including woodpeckers, wrens, warblers, owls, hawks, wood ducks, mergansers, raccoons, bats, squirrels and opossums. Snag requirements differ by species. Distinction is made between hard (some value as marketable wood) and soft (advanced stage of decay) snags. Hard snags become soft snags if they are left alone and not removed from the woodlot. Soft snags are critical for a majority of snag-dependent wildlife. Snags take up very little growing space and should be left uncut whenever possible (see Figure 1 for snag management recommendations). Three to seven dead or dying trees should be left for wildlife use. Snags should also be left in waterfowl management areas for use as perches and nesting sites.

Figure 1. Recommendations for snag management by Evans and Conner for North Central and North Eastern Forests

- * Manage for maximum feasible rotation length
- * Consider old growth a high priority
- * Leave 1/4 acre permanently uncut clumps in each 3-1/3 acres harvested
- * Discontinue removal of dead, dying and decayed trees—leave for snags
- * Consider constructing artificial nesting boxes
- * Leave buffer strips along both sides of streams
- * Leave shelter belts

REFERENCES AND RECOMMENDED READING

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APPENDIX

JUDGING YOUR ACORN POTENTIAL*

Abundance of oak acorns is one of the most important factors affecting the suitability of mixed oak woodlands for deer, turkey, and squirrels. Here is a way to judge your woodland's potential for producing acorns for wildlife.

1) Pick a few areas that seem to be representative of your woods and mark off a circle about 60 feet in radius. This approximates a one-quarter acre plot.

2) Count all oak trees 10 inches or larger DBH (diameter at breast height) inside the plots. These are your best producers. Separate your counts into 2-inch diameter classes (10, 12, 14, etc.).

3) Calculate basal area (BA) of each diameter class using the figures listed in Table 1. For example, if you have six oaks that are 12 inches DBH, multiply 6 by 0.79. ($6 \times 0.79 = 4.7$).

4) Add all the basal areas together and multiply by 4 to get an estimate for one acre.

Table 1. Basal area of trees by 2" diameter classes.

<u>DBH</u>	<u>Basal Area</u>
10"	0.55
12"	0.79
14"	1.07
16"	1.40
18"	1.77
20"	2.18
22"	2.64

* Published by Neal Wilkins in University of Tennessee Forestry Renewable Resources Timely Tips, Vol. 5, No. 3 (July 1989). Adapted from Crawford, H.S. and R. L. Marchinton. 1989. A habitat suitability index for white-tailed deer in the Piedmont. Southern Journal of Applied Forestry 12 (1):12-16.

ACORN INDEX

The acorn potential index presented in Table 2 is based on a top score of 100. If your condition is rated fair or poor but you have many oaks smaller than 10 inches DBH, just wait and give them time to grow. This method can be simplified by foresters using a BAF 10 or 20 prism and simply calculating BA/acre of all oaks greater than 10 inches DBH. Please keep in mind that this is only an index. For example, trees that inherently produce a large number of flowers, grow on forest edges or grow in the open may produce greater numbers of acorns. You can get more detailed information about the potential of your woodlot, with respect to wildlife and timber production, from the Tennessee Wildlife Resources Agency, Tennessee Division of Forestry and the University of Tennessee Agricultural Extension Service.

<u>Basal Area Score</u>	<u>Acorn Potential</u>
Below 40	Poor
40 - 60	Fair
60 - 80	Good
80 - 100	Excellent
Over 100	Excellent but may need thinning

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