

# Forest Diversity: The Food of Life



Forests provide three important benefits for wildlife: cover, food, and water. Both quality and quantity are important for these basic needs, and they should be distributed across the property. Forest diversity is important, and you can manage wildlife habitat in forests to improve diversity.

Timber stands vary in species composition, age, size, and shape. These same stands will also vary in the type, amount, and quality of food produced for wildlife. It is important to focus on key species when making forest/wildlife management decisions because different species require different types of forest.

For example, a 20-acre clear-cut provides excellent deer, turkey, rabbit, and quail habitat for several years. However, this same site is not good for fox squirrels. A mature hardwood forest may provide excellent squirrel habitat; however, because of the shading effect of the tree crowns, there may be little or no browse (green plants) growing on the forest floor most of the year for deer. Therefore, deer food is limited to the fruit or nut crop.

The size of a forest stand is also very important. The 20-acre clear-cut is ideal deer habitat, but a 500-acre clear-cut is not as productive. Some wildlife favor edges because some of their favorite foods grow at the edge of the forest, and openings provide places for nesting and brooding.

A forest goes through many changes from the time it is established until it reaches maturity. A clear-cut will soon become a young sapling stand, which will eventually grow into a chip-n-saw stand, and finally, after many years, become a mature stand of sawtimber. Each phase of the forest's life provides different types and quantities of food and habitat for wildlife.

Basal area is the cross-section of the tree used to determine the density of the stand. As basal area increases, say to 120 square feet, the pounds of forage on the forest floor decrease because the understory plants do not have enough sunlight. Ideal basal area is around 70 to 80 square feet for most wildlife. Quail prefer about 60 square feet.

Therefore, the key to good wildlife habitat management is forest diversity. The ideal forest will have timber stands of all ages, sizes, and species interspersed over the acreage.

This forest diversity will provide the variety of resources required to meet the nutritional needs of the wildlife.

Forest management for diversity is a matter of manipulating plant succession. During plant succession, a disturbance is created in the forest. Next, annual plants and weeds dominate the landscape. Perennials and grasses develop, including fennel and blackberry. Years after the disturbance, pines begin to dominate, followed by shade-tolerant hardwoods like oaks. This process can take hundreds of years. The loop of plant succession will continue with another forest disturbance event (lightening, for example) in the hardwood canopy.

The question is: Will you manage plant succession, or will you allow it to take its course? Forest habitat management simulates natural processes and manipulates plant succession much more quickly than what would occur naturally.



Chickadee.  
Bob Hines. 2008. U.S. Fish and  
Wildlife Service.

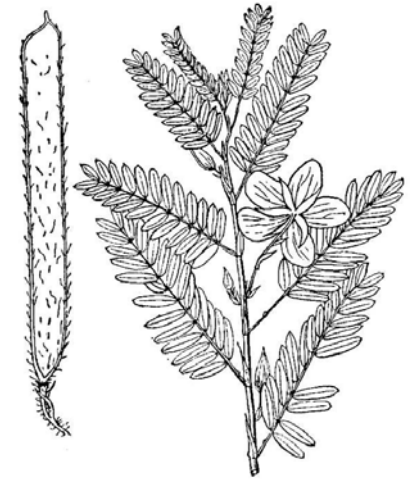
With these objectives in mind, landowners can easily improve wildlife habitat in their forests. There are two basic principles of diversity. **Structural diversity** includes vertical and horizontal diversity. **Plant diversity** determines the quality and quantity of wildlife food. Both types of diversity are dependent on the site conditions of the stand, including climate, soils, slope, and aspect. Much of this information can be determined from the USDA Soil Survey.

Riparian corridors are one way of achieving **horizontal diversity**. These corridors mitigate erosion and improve water quality. They provide many types of plants and insects that can be used as food by wildlife. They are natural wildlife travel corridors and provide abundant dead wood where forest fauna can live. Because of these benefits, riparian corridors have high wildlife diversity.

**Vertical diversity** involves managing the vertical structure of the stand for different species and age classes. Structure should consist of plants at the forest floor, the herb level, shrubs, understory, and canopy. Certain songbirds, for example, only live in the understory. American beautyberry and huckleberry are in the understory. Dogwood, persimmon, and maple grow in the mid-story, and oaks and hickories grow in the canopy. Don't forget to leave some dead and hollow trees that wildlife need.

Finally, wildlife need **plant diversity**. Acorns, or mast, are great, but forage is the key to high plant diversity and good wildlife habitat because forage increases available protein. Acorn production is highly variable. Most species of oaks in Mississippi begin producing acorns after about 25 years. Therefore, young stands will not have as many acorns as older stands. White oak acorns mature every year and are prolific but irregular seeders. Although red oak acorn production is more reliable, the seeds mature in 2 years. Acorn production is also highly dependent on soil characteristics.

Good forage includes a diversity of native plants that are managed for seasonality. Wildlife need food year-round, so forage should be managed for seasonality. Native animals in Mississippi have adapted to native plants such as partridge pea, maximillian sunflower, and goldenrod. Wildlife food plots increase food diversity but do not necessarily increase long-term plant diversity in the forest. Native plant management can entail strip disking, fertilization, controlled burning, and manipulation of water levels in wetlands.



Partridge Pea.  
USDA-NRCS PLANTS  
Database / Britton, N.L.,  
and A. Brown. 1913.  
*An illustrated flora of the  
northern United States,  
Canada and the British  
Possessions. 3 vols.*  
Charles Scribner's Sons,  
New York. Vol. 2: 337.

Forest diversity is also beneficial in other ways. For example, a person may own 100 acres of 25-year-old pine trees. This landowner has only limited options in forest management. He or she will have to thin and eventually harvest the entire track at one time. Harvest income will be only once every 30 to 40 years. If this same landowner owned 100 acres of forestland that consisted of four 25-acre timber stands of different ages (such as 5, 10, 15, and 20 years), he or she would be able to make periodic timber sales every 5 to 8 years, providing a consistent income from the timber.

Consider managing for forest diversity to enhance your wildlife and timber resources.

## Resources

USDA Natural Resource Conservation Service Web Soil Survey available online at <http://websoilsurvey.nrcs.usda.gov>.

Mississippi State University Natural Resource Enterprises available online at <http://www.naturalresources.msstate.edu/>.

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