

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 an animal's home range. Forest diversity is vital and can be improved through wildlife habitat management.

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 crucial to focus on key species when making forest/wildlife management decisions because different species require different forest conditions.

For example, a 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 an excellent squirrel habitat; however, because of the shading effect of tree crowns, there may be little or no browse (green plants) growing on the forest floor for deer.

The size of a forest stand is also very important. A 20-acre clear-cut is an ideal deer habitat, but a 500-acre clear-cut may not be 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 mature stand of sawtimber. Each phase of a forest's life provides different types and quantities of food and habitat for wildlife.

Basal area is the cross-sectional area of a tree in square feet and is used to determine stand density. As basal area increases, pounds of forage on the forest floor decrease because understory plants do not have enough sunlight. A good compromise between adequate stocking of trees and food for most wildlife species typically occurs around 70 to 80 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 diversity will provide the

variety of resources required to meet the nutritional needs of wildlife.

Forest management for diversity is a matter of manipulating plant succession. During plant succession, an initial disturbance is created in the forest. Next, annual plants and weeds dominate the landscape. Perennials and grasses develop, and then, after the disturbance, shade-intolerant species 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 (e.g., lightning) 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.

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 stand site conditions, including climate, soils, slope, and aspect. Much of this information can be determined using a United States Department of Agriculture (USDA) soil survey.



Chickadee. Image credit: Bob Hines, U.S. Fish and Wildlife Service.

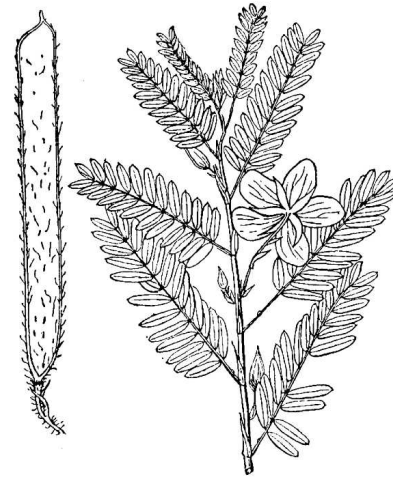
Riparian corridors are one way to achieve **horizontal diversity**. These corridors mitigate erosion and improve water quality. They provide many types of plants and insects that are used as food by wildlife. They are natural wildlife travel corridors and provide deadwood where forest fauna can live.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

Vertical diversity involves managing a stand's vertical structure 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. Don't forget to leave some dead and hollow trees.

Finally, wildlife need **plant diversity**. Acorns, or mast, are great, but high plant diversity and quality forage are key to good wildlife habitat because forage increases available protein. Acorn production is highly variable. Most species of oaks in Mississippi begin producing acorns after about 20 years. Therefore, young stands will not have as many acorns as older stands. White oak acorns mature every year and are prolific but sometimes irregular seeders. Red oak acorn production is more reliable, and seeds mature in 2 years. Acorn production is also highly dependent on soil characteristics.

Good forage includes a diversity of native plants managed for seasonality as needed by wildlife. 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 include strip discing, fertilization, controlled burning, and manipulating water levels in wetlands.

Forest diversity is also beneficial in other ways. For example, a person may own a 100-acre, 25-year-old pine stand. This landowner has limited options in forest



Partridge pea. Image credit: USDA-NRCS PLANTS Database /N.L. Britton and A. Brown.

management. They 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), assuming market conditions were favorable, they 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 (NRCS).
Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov>

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

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