LANDOWNERS FOR WILDLIFE

Landowners for Wildlife
Private Lands Program

FOREST MANAGEMENT IN BOTTOMLAND HARDWOODS

By David Breithaupt, Wildlife Biologist

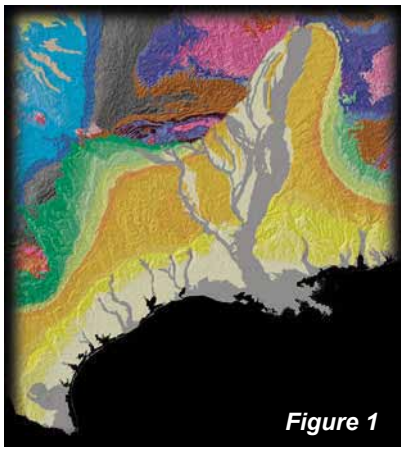


Figure 1

The history of land use in areas where bottomland hardwood stands once dominated has been one of exploitation and conversion to agricultural uses. These areas were generally located on the most productive soil types in North America. The timber resources needed for European settlement were present in unimaginable expanses and, upon removal of this timber, settlers were left with the finest agricultural land they could have envisioned. The high productivity of these areas had been fostered for centuries by a combination of naturally fertile soils associated with large river systems.

The area of Louisiana with the most widespread acreage of bottomland hardwood forest is part of the Mississippi Alluvial Valley (MAV). This area is composed of land in the historic floodplain of the Mississippi River. *Figure 1* shows the extensive MAV region (the gray area) extending for millions of acres throughout the center of the United States. Prior to major levee construction by the government in the early 1900s, large portions of the MAV (particularly Louisiana) were regularly flooded for extended periods of time, often more than once a year. Each flood event, year after year, century after century, deposited rich alluvial soil from places as far north as Minnesota, Illinois and Iowa. This flooding regime provided a rich carpet of fertile sediments and nutrients, excellent conditions that were quickly utilized by a wide variety of plants.

Bottomland hardwood forests are commonly classified by the dominant trees found on the site and governed by their flood tolerance. The lowest areas, closest to the permanent river channel are the first to flood and last to dry out. These low sites stay flooded for longer periods than sites at higher elevations located farther from the river channel. For this reason, forested areas dominated by bald cypress and water tupelo are usually closer to the river channel. Moving up the elevation gradient, overcup oak and water hickory (bitter pecan) become common. Eventually nuttall oak and cherrybark oak become common as sites become drier and less frequently flooded (*Figure 2*).

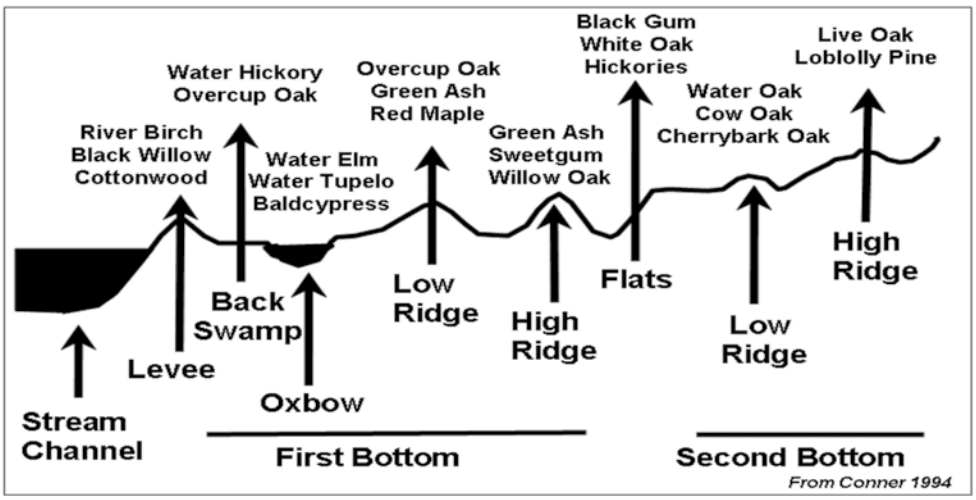


Figure 2. Distribution of tree species along hydrologic gradient.


Photo by Brian Lockhart, USDA Forest Service, *forestryimages.org*

Even before settlement, disturbance was a common occurrence across the landscape. Floodwaters eroded land in some places and built it up in other places. Other disturbances such as fire, ice storms, tornados and hurricanes altered thousands of acres, periodically replacing areas of mature forest with vegetation typical of young forests. These disturbances created a diverse bottomland hardwood community.

Today's typical bottomland hardwood stands are located on sites disconnected from larger tracts of forestland. Most of these smaller tracts are very poorly drained, which saved them from conversion to soybean agriculture in the 1960s and 1970s. Many of them are unmanaged, preserved relics of what once grew in the area. With proper forest management, these forests could produce quality wildlife habitat and economic benefits and still retain their environmental quality and aesthetic values. In many cases, unmanaged bottomland forests are dominated by large trees with closed canopies that limit the amount of sunlight reaching the ground. In these situations, the understory and midstory are usually very sparse, limited by lack of sunlight and over-browsing by deer. With little understory and regeneration of the dominant trees, the forest will degenerate and have limited value to wildlife and the landowner (*Figure 3*).

The goal of forest management in most bottomland hardwood stands is to increase the amount of sunlight that penetrates the forest canopy. Sunlight will produce a flush of herbaceous and woody vegetation beneficial to wildlife, and will prompt regeneration of valuable trees. Songbirds, deer, wild turkeys, black bears, rabbits and squirrels benefit. Plant succession will start with herbaceous vegetation, followed by woody species. Seedlings of the remaining canopy will represent the woody species, but wind and waterborne seeds will introduce new species as well.

There are a variety of methods to improve the composition and health of bottomland hardwood forests, but commercial logging (*Figure 4*) is probably the most common practice used in merchantable timber stands. Selective herbicide applications (*Figure 5*) may be used to improve species composition in younger stands.

These methods, alone or in combination with others, can be applied in varying intensities. Most forestland owners desire to retain the aesthetic qualities of their forest while conducting forest management activities. Proper planning and an understanding of the natural processes that shape these forests will aid in keeping them pleasing to the eye while producing a healthy bottomland forest.

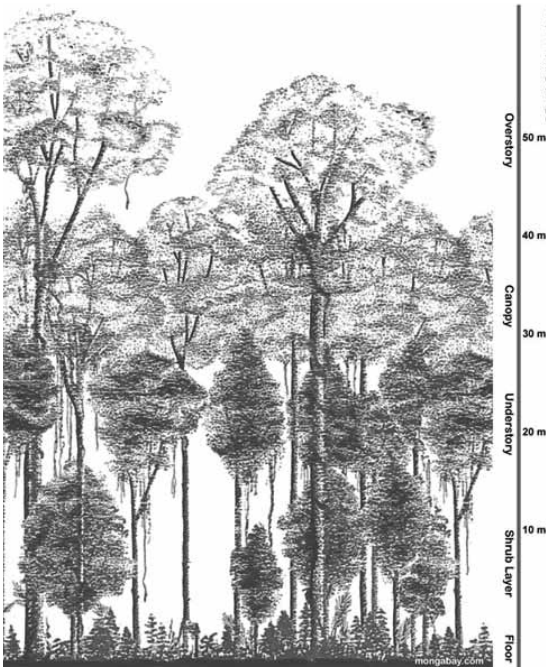


Illustration by Rhett A. Butler, *mongabay.com*

Figure 3. Notice the Canopy, Mid-story, Understory and Ground Cover. The absence of one or more of these layers could indicate a need for management.

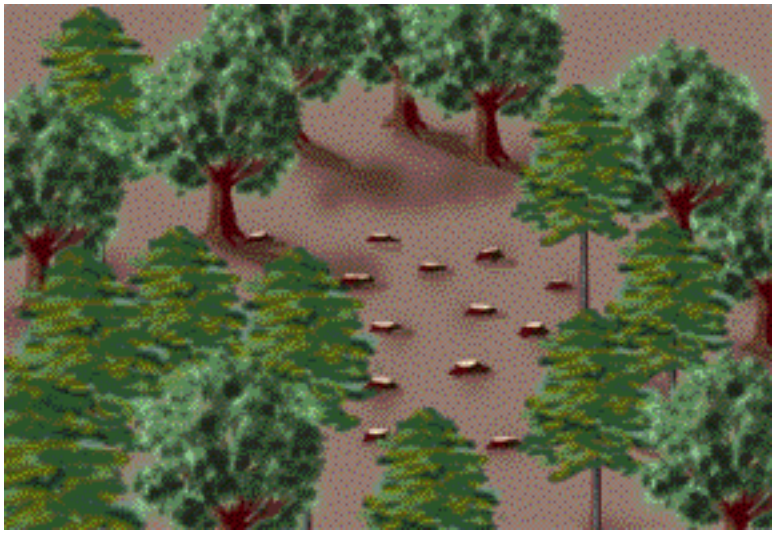
Figure 4. Photo by Brian Lockhart, USDA Forest Service, *forestryimages.org*

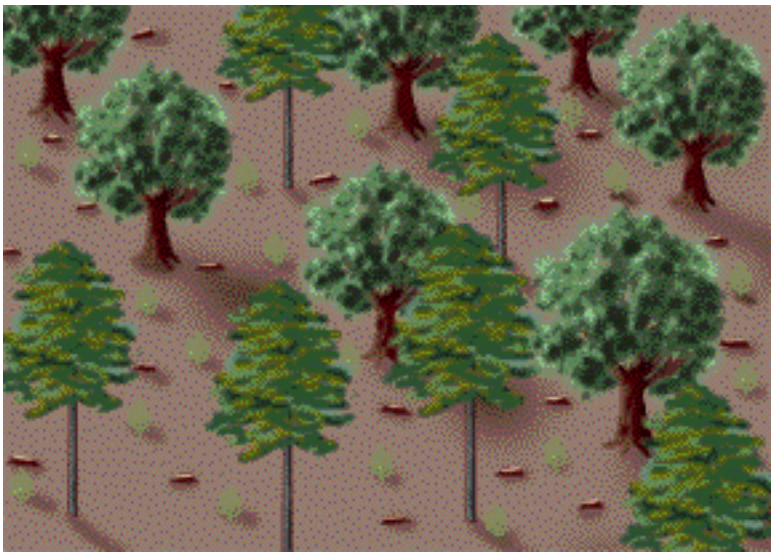
Figure 5. Photo by James H. Miller, USDA Forest Servic, *forestryimages.org*

HARVEST AND TIMBER STAND IMPROVEMENTS (TSI) METHODS

GROUP SELECT

This method may be applied to create larger (.25-acre to 2-acre) gaps in the forest canopy. During subsequent growing seasons, the treated area will develop thick early succession vegetation, such as blackberry/dewberry, French mulberry, greenbrier and saplings of regenerating trees. These plants provide food and cover for white-tail deer, songbirds, rabbits and woodcock. Group selections are especially useful in managing habitat for wild turkeys. Group cuts located on the higher elevations can produce good nesting cover for two or three years following treatment. The surrounding open areas provide brood habitat and travel corridors for wild turkeys. Groups may be strategically located to retain the aesthetic qualities valued by many landowners.



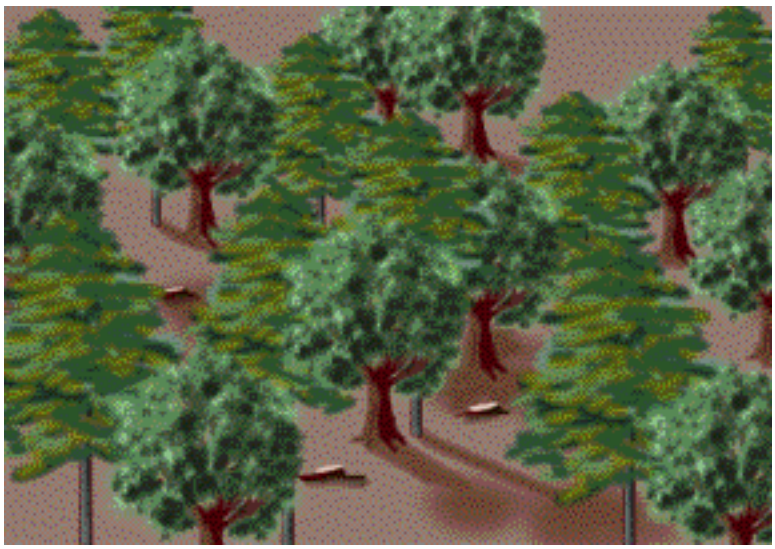


SHELTERWOOD

A shelterwood harvest may be applied in stands that are made up of less desirable trees, or where there may be a need to remove more biomass. Trees that are left will provide a seed source for forest regeneration. Forage and cover will be more evenly distributed than in a group select, as sunlight will reach the ground over much of the stand. Shelterwood harvests should be carefully conducted so that canopy removal is targeted to meet the landowner's objectives. Harvested areas should be monitored closely for several years to determine whether additional effort is needed to control regeneration of undesirable or invasive species.

SINGLE TREE SELECT

Individual trees in a single tree select harvest are removed based on a combination of their age, proximity to other beneficial stems, location on the property, and economic value. For example, an older tree toward the end of its life cycle may be harvested to capture timber revenue, to make room for other desirable trees, or to create a canopy gap that will generate an area of dense undergrowth for wildlife. Cutting decisions are made on a case-by-case basis across the property to create diversity within the stand. This method is the most appealing to many landowners, but requires a trained eye to apply correctly. Care should be taken not to harvest only trees of high monetary value (high grading).



Illustrations provided by Chris Brown, North Carolina Forestry Association

Effective bottomland hardwood management, like other forest management, is an ongoing activity. Frequent assessment and properly applied treatments will help maintain plant and animal diversity - the best indicator of a healthy forest. LDWF Private Lands Program biologists can help a landowner develop a set of realistic goals, formulate a habitat management plan, and assist with implementing that plan. LDWF biologists will work with other land management professionals, such as consulting foresters, to help landowners achieve their goals.

OTHER ITEMS TO CONSIDER WHEN MANAGING YOUR HARDWOOD STAND

- Retain cavity trees throughout the stand for cavity nesting birds and dens for mammals.
- Leave dead or stressed trees (snags) throughout the stand for future cavities and structure for insect foraging birds.
- Vines provide foraging habitat for songbirds.
- Leave coarse debris (10 inches in diameter or greater) from logging operations to provide den sites and habitat for invertebrates, amphibians and reptiles.

HOW SHOULD I PROCEED WITH MAKING TIMBER MANAGEMENT PLANS FOR MY PROPERTY?

If creating diverse and productive wildlife habitat is among the most important of your goals, contact your local LDWF Private Lands Program biologist. The biologist will listen to your objectives, help with your conservation planning, and help you connect with other resource professionals that can assist you in achieving your goals. The biologist will be available to monitor the success of your plan and recommend modifications to your plan.

WHERE CAN I LEARN MORE ABOUT FORESTRY PRACTICES TO BENEFIT WILDLIFE?

Much more detailed information is available in a free publication from the Lower Mississippi Valley Joint Venture Forest Resource Conservation Working Group, called *Restoration, Management, and Monitoring of Forest Resources in the Mississippi Alluvial Valley: Recommendations for Enhancing Wildlife Habitat*. It is available at: *www.lmvjv.org/bookshelf.htm*.

Photo by Brian Lockhart, USDA Forest Service, *forestryimages.org*

Photo by David J. Moorhead, University of Georgia, *forestryimages.org*

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