



## Ten Tips for Increasing Wildlife Biodiversity in Your Pine Plantations<sup>1</sup>

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Many forest landowners are interested in managing their property to achieve more than one objective. It is quite common for forest landowners in Florida to aspire to produce timber products while also providing habitat for wildlife. Some individuals are most interested in increasing the abundance of game species to maximize hunting opportunities, and they should see the publication, "Ten Tips for Encouraging the Use of Your Pine Plantations by Game Species," at <http://edis.ufl.edu/UW318>, for more information. High priority for other forest landowners is providing habitat that will attract a diversity of wildlife species. Here we discuss strategies to achieve this goal.

Production of timber products and enhancement of wildlife diversity are compatible objectives. However, some tradeoffs may be necessary because strategies that maximize timber growth are typically not exactly the same as strategies that will provide habitat for a wide variety of wildlife species. For this reason, it is important to prioritize your objectives and decide where wildlife ranks relative to timber production in your land use planning. If wildlife is your first priority, you may want to incorporate all ten

of the tips listed below. If timber production is your top priority and wildlife is second, you may want to adopt fewer of the suggestions provided on ways to tweak pine plantations to provide habitat for a range of wildlife species.

### Tip #1 – Manage Your Timber on Long Rotations

An individual forest stand will provide habitat for different suites of wildlife species at different points in time as the stand ages. For example, some wildlife species thrive in the early stages of stand development and others at the later stages. Few animals thrive in middle-aged stands because of heavy shading. Landowners who manage on short rotations always have many stands in the middle-aged stage, which means that a large portion of their land is in a stage where it is not producing quality habitat for most wildlife species. Increasing the rotation length of each stand will ensure that a greater number of stands will be producing quality habitat for a variety of wildlife species at any particular point in time.

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Mature stands of trees are the most valuable from a wildlife perspective. Many wildlife species thrive in conditions provided by more mature forest stands and will congregate in the few older stands they can find.

### **Tip #2 – Promote Cavities, Snags, and Logs**

Cavities are an important habitat feature for a large number of animals. Nearly 40 species of birds and a variety of mammals require cavities for nesting, roosting, and denning. Hardwood trees (broadleaved trees such as oaks, maples, beech and sweetgum) and cypress often develop cavities while alive, whereas most conifers (cone-bearing softwood trees) such as pines are more likely to develop cavities after death. Because cavities are often the limiting factor for species that use them (the "limiting factor" is the one key habitat element missing from a given area), it is recommended that trees with cavities always be retained unless they pose a safety hazard during logging operations. If trees with cavities are in short supply, artificial nest boxes can be used as a partial substitute in areas where den trees are lacking. See "Helping Cavity-Nesters in Florida," at <http://edis.ifas.ufl.edu/UW058>, for additional information on providing cavities for wildlife.

Snags (standing dead or dying trees) provide additional benefits for wildlife in the form of hiding places beneath peeling bark, branches free of foliage to serve as perches for foraging raptors, and food for many animals in the form of insects and fungi. Because artificial nest boxes provide only cavities and not these other resources, nest boxes should not be thought of as an equivalent substitute for dead and dying trees.

Once snags have fallen to the ground, they provide resources for an entirely different group of animals. Logs are used as shelter, as basking sites, as navigational aids, and as a cafeteria of different foods for wildlife which feed on insects, spiders, worms and fungi. See "Dead Wood: Key to Enhancing Wildlife Diversity in Forests," at <http://edis.ifas.ufl.edu/UW277>, for additional information on the importance of dead wood for wildlife and tips on how to provide it.

### **Tip #3 – Increase Spacing Among Trees**

Planting pines at high densities (greater than 600 trees per acre, or tpa) is a strategy often used to maximize growth rates of pines. With this strategy, little sunlight can reach the forest floor, so little vegetation is able to compete with the pines for nutrients and water. Complete lack of groundcover greatly reduces the ability of a stand to provide food and/or cover for most wildlife species. Many animals rely on herbaceous plants (i.e., grasses, legumes and forbs) on the forest floor for food, and if herbaceous plants are absent, animals will not use the stand.

Two modifications can make pine plantations more suitable for wildlife. First, pines can be planted at lower densities (350 to 500 tpa). Alternatively, pines can be planted at high densities, and then thinned several times early in the life of the stand. The first thinning should occur when trees reach a merchantable size (usually about 15 years for pulpwood). Later thinning can occur at 5- to 10-year intervals thereafter.

### **Tip #4 - Use Herbicides to Selectively Control the Hardwood Mid-Story**

In stands with widely spaced pines, hardwood shrubs and trees can develop into a dense mid-story that blocks sunlight from getting to the ground. A dense mid-story also increases competition among pines, shrubs, and herbaceous plants growing at the ground level. As mentioned in tip #3, the herbaceous plants that grow at the ground level provide an extremely important source of food for wildlife. Herbicides can be used to selectively remove the hardwoods without harming desirable herbaceous plants and shrubs that produce berries, such as beautyberry, wax myrtle, sumac, plum and saw palmetto. See <http://edis.ifas.ufl.edu/FR181> for specific recommendations on how to control hardwoods in pine stands.

### **Tip #5 – Use Fire to Stimulate Non-Woody Groundcover and to Control Hardwoods**

Florida experiences more lightning strikes than any other state in the country. These lightning strikes often start natural wildfires in wooded areas, which stimulate the growth of many plants that serve as food for wildlife. Prescribed burning is a technique that can be used to obtain the same benefits that would occur after a wildfire, but under more controlled conditions.

Fire can increase habitat quality for wildlife in several ways: it reduces the hardwood mid-story, increases the abundance and diversity of herbaceous plants, and improves the quality of herbaceous plants as wildlife food. The new, succulent herbaceous growth that sprouts soon after a fire is more palatable and more nutritious than the older, tougher plant growth cleared away by a fire. Also, fire increases seed, fruit, and flower production of many plants, which results in a greater diversity and increased quantity of food for wildlife. See <http://edis.ifas.ufl.edu/FR055> for additional tips on prescribed burning.

### **Tip #6 – Consider Your Choice of Pine Species Carefully**

Most of the southeastern Coastal Plain was historically forested with longleaf pine (*Pinus palustris*), so native wildlife species are well adapted to longleaf forests and savannas (sparsely forested grasslands). The branching architecture of longleaf pines is such that more sunlight reaches the forest floor in longleaf stands than in slash pine stands (*Pinus elliottii*). Due to their inability to self-prune, even less sunlight reaches the ground in loblolly (*Pinus taeda*) and sand pine (*Pinus clausa*) stands.

### **Tip #7 – Don't Be Too Thorough When Cleaning Up After Logging**

Logging debris such as tree tops and limbs (called slash) can be a valuable source of food and cover for many smaller animals. If retaining some slash on the ground will not impede future plans for initiating a new stand of trees, some slash can be

left—either spread out to break down and recycle nutrients into the stand to improve growth, or collected in small piles to provide escape cover and food for animals. Either approach has the added benefit of reducing the costs associated with collecting and removing these materials after timber harvest.

However, it is important to recognize that leaving large amounts of slash on the ground for extended periods can increase the risk of wildfire. Prescribed burning on a regular basis can greatly reduce this risk.

### **Tip #8 – Maintain Habitat Diversity**

The greater the variety of food and shelter available in a given area, the greater the variety of wildlife that can reside there. Providing diverse food sources in the areas next to managed pine stands will allow the stands to support more wildlife. Many hardwood trees and shrubs provide hard mast (nuts from oaks, hickories, beech, etc.) and soft mast (fruit from cherry, dogwood, persimmon, wax myrtle, plum, etc.) that serve as food for wildlife.

Drainages and bottomland forests are areas where hardwoods naturally predominate, and a variety of food resources is typically available there. These areas should not be converted to pines, but should be allowed to stay as is. If any hardwoods are harvested from these areas, care should be taken to retain those individual trees that consistently produce large mast crops. See <http://edis.ifas.ufl.edu/UW293> for additional information on managing oaks for wildlife, and tips on selecting "leave trees" during timber harvest operations.

Providing a diversity of cover options is also important. Small patches of low brushy vegetation in and around pine stands can provide escape cover as well as food resources. Periodically disturbing such areas will stimulate early successional mast-producing species such as blackberries and dewberries, while preventing the growth of woody plants. Creating and maintaining a few small openings will benefit those species that thrive in areas where forests and open areas meet (edges).

## Tip #9 – Create Travel Corridors

Most wildlife avoid exposed, treeless areas during daylight hours. In agricultural landscapes where forest stands tend to be isolated, planting narrow forest lanes (3 to 5 rows of trees) to connect isolated stands can increase animal movement between stands. Similarly, fence rows can serve as travel corridors for animals wanting to move between forest stands if natural vegetation is allowed to grow up along them, and if invasive exotic vegetation is controlled. Unfortunately, birds perching on the fence are equal opportunity planters of both desirable and invasive species! See <http://edis.ifas.ufl.edu/UW241> for tips on creating natural fence rows.

## Tip #10 – Protect Riparian, Aquatic, and Wetland Areas

Standing or moving water is an essential resource for most species of wildlife. All animals require some form of water, and most vertebrate species get their water by drinking (although some can get adequate water from dew and humidity). Many species also require water for breeding, or they require as food some organism that lives only in water bodies. The lush vegetation that grows in wet areas also attracts many wildlife species searching for cover. For all these reasons, areas surrounding water bodies (such as streams, rivers, lakes, ponds, wet sinkholes and even simple low-lying depressions that fill periodically with water) are hotspots of activity for wildlife. Efforts should be made to protect these areas from erosion, such as retaining buffers around them when harvesting and creating bridges to pass over them rather than placing roads through them.

Guidelines have been established for forestry and road-building activities in and near wetland areas, called Best Management Practices (BMPs). See <http://edis.ifas.ufl.edu/FR006> for details on harvesting, skidding, and road building BMPs.

## Additional Information

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