

## Appendix E

### Vegetation Management Recommendations

Managing native vegetation (browse, weeds, grasses) to prevent continuous overuse by deer or cattle so that the native vegetation provides the majority of nutrition year-around for deer and other wildlife should be of primary concern. Over 50 percent use of most species on a continuous basis will stress vegetation, causing less production or killing of the plant.

Managing or planning for the long term, considering wet years as well as drought years, and not carrying more livestock or deer than the land will support during poor as well as good years should be the overall goal.

Wildlife have a certain requirement for cover. Cover provides a sense of security from disturbance and protection from inclement weather and predators. The amount and kind of cover vary with the species. A stand of herbaceous plants may provide adequate cover for some bird species and small mammals, while other species require woody cover (trees and shrubs) in lieu of or in addition to herbaceous cover. The best cover for a large species such as white-tailed deer is a pattern or mosaic of woody brush and trees interspersed within open areas at an approximate 1/1 ratio of open area to woody cover. Clumps or strips of brush should be wide enough so that an observer cannot see through them from one side to the other during the winter months when deciduous species are bare of leaves. Cover strips should be as continuous as possible to provide travel lanes. Deer and other wildlife can be displaced by disturbance from an area without adequate escape cover. A habitat that provides several different types and arrays of cover benefits more species of wildlife than a habitat that has limited types, amounts, and distribution of cover.

During the past 30 - 40 years, significant areas have been planted to mono-culture tame grasses such as Coastal or common bermuda, bahia, etc. (often requiring the clearing of forest land). Overseeding these existing pastures with clovers, or gradually returning this acreage to native grasses and forbs can make these areas more productive for wildlife.

Understory conditions throughout much of the Pineywoods is in less than ideal condition due to over browsing by cattle, and in some instances deer. Habitat conditions can be improved through proper timber management, prescribed burning, and in some instances periodic grazing. Sound management of large ungulate populations (deer, feral hogs, and exotics) can prevent over utilization of preferred forage species and the resulting reduction of cover.

Large (1,000 acres +), unbroken tracts of mature bottomland hardwoods are scarce. Much of the bottomland hardwood forests have been lost to reservoir construction and agriculture activities. Loss and fragmentation of this nesting habitat for neotropical

migratory songbirds appears to be a prime factor in the decline of many species that require relatively unbroken tracts of hardwoods. Past management of many bottomland hardwood stands has been limited to the harvest of only the largest and best quality trees. This “high grading” has resulted in many stands that are comprised of poorly formed trees and in some instances has resulted in a change in the species composition of the stand. Continuous “high grading” may lead to a stand that is dominated by species that are less desirable for both timber management and wildlife management. Sound timber management can lead to improved habitat conditions and the sustained production of quality hardwood timber.

Habitat management, regardless of the habitat type, is a long term process that requires planning. Any vegetation manipulation practice will have an impact on resident wildlife species. The impact may be positive or negative depending on the type of treatment used, the degree of use, and location. No single habitat management practice will benefit every species of wildlife. Before implementing any vegetation management practice, determine what the long-term effects will be for each wildlife species that occurs in the area and minimize the negative impacts. Consider the location and size of sensitive wildlife habitats that provide important nesting or roosting sites, feeding areas, desirable wildlife food producing plants, and wildlife cover, water, and space needs. Wildlife can be displaced by disturbance from an area unless adequate escape or security cover is present. The amount and distribution of cover on adjacent lands needs to be taken into consideration when assessing the cover needs of wide-ranging wildlife species such as deer and turkey. A small ranch would need a larger amount of security cover, on a percentage basis, than would a larger ranch where the vastness of the area provides security.

The control of woody plant species that invade grassland communities may be warranted to maintain agricultural production. Vegetation manipulation may be in the form of prescribed burning, mechanical, biological, or chemical control of trees, brush, or weeds, or other vegetation or soil manipulation procedures. Most of these practices will require the use of specialized equipment or machinery for plowing, discing, bulldozing, or spraying. The cost effectiveness of the different control measures must be considered prior to initiation of control measures.

Prescribed burning is an effective, low-cost habitat management tool that can be used to enhance plant diversity by stimulating the production of a variety of forb and grass species and to maintain woody plants at the low heights most beneficial to wildlife. Livestock as well as wildlife can benefit from a properly planned and conducted prescribed burn. However, there are legal constraints and liabilities in the use of fire. The land manager should be well-trained and knowledgeable on the proper use of fire before attempting a prescribed burn.

Prescribed Burning Recommendations: To maintain open understory conditions in pine and mixed pine and hardwood stands, a regular burning program should be initiated. Burns should be conducted during the dormant season, generally November through early March (before spring green up). Burning will reduce the amount of debris on the

ground and improve habitat conditions for deer, turkey, and other species of wildlife. Burning stimulates the production of herbaceous vegetation and legumes which are beneficial to a variety of wildlife species. Burning also improves the quality of existing browse plants by killing the above ground portion of the smaller plants, causing the plants to resprout from the roots. The new growth is more nutritious and palatable to deer. A regular burning program will improve habitat conditions for turkeys by reducing the dense, rank understory vegetation that blocks visibility and limits mobility. Burning also benefits turkeys and other insect eating species by increasing the insect populations in the understory. Insects are an important food source for turkeys, especially poults, in the spring and early summer.

Ideally, burns should be conducted in small blocks (30 to 50 acres) to increase the amount of edge and diversity within the stand. Approximately 20% to 30% of pine stands that are at least 15 years old should be burned annually. Pine stands less than 15 years old should not be burned because of the potential to damage the relatively young trees. Follow up burns should be conducted on a 1 to 7 year rotation in pine stands, depending on vegetation condition and the productivity of the site, to maintain the desired understory conditions. Mixed pine and hardwood stands should be burned less frequently, on a 5 to 10 year rotation, to minimize damage to hardwood timber. On highly productive sites burns will need to be conducted more frequently to maintain the desired understory conditions.

In some instances where very dense woody vegetation is present in the understory, burns may need to be conducted during the early spring (March or April) to achieve the desired results.

The use of prescribed fire is probably the most cost effective and beneficial tool that the wildlife manager can use. However, if misused, fire can be damaging to wildlife, timber, and other resources. Fire should be excluded from all bottomland areas. A low creeping fire that "backs" into a hardwood bottom is generally not damaging, but a "hot" fast moving head fire should not be allowed to burn into a hardwood bottom. A regular program of thinning and burning in pine stands will provide high quality habitat for deer and other wildlife species.

To restore and maintain native grasslands, prescribe burn about one-third of native grass openings each year, burning each site every three years, on a rotating basis. This will remove old growth and young, invasive woody growth such as pine, winged elm, and persimmon. This will stimulate new growth of plants that may have become dormant due to lack of disturbance which often stimulates growth. Pasture burn sites should normally be less than 40 acres and be burned in late summer (late August through September) weather conditions permitting. About seven times more insects are usually found in burned native grass areas compared to unburned areas. The increase of insects will provide high protein food for quail and turkey, especially the young, during the spring and summer.

General burn prescriptions for pine and mixed pine and hardwood stands and native

pastures are:

1. Prepare disked bare-ground fire guard around all sites before burning. Disked fire guards, which can include roads and right-of-ways, should be 15 to 20 feet wide. (These disked areas can be planted to winter supplemental food plots between burn years.)
2. Humidity should be between 25 - 40 percent.
3. Wind speed should be between 10 - 15 miles per hour.
4. Always burn into the wind first (backfire) 50 yards into the woods or pasture, then set fire with the wind (headfire). The entire burn may be conducted with a backfire, depending on fuel and weather conditions and burning experience of crew.
5. Initiate burns in the morning, after 9:00 a.m.

Consult with TPWD, Natural Resources Conservation Service (NRCS, formerly Soil Conservation Service, SCS), or Texas Forest Service, and notify local volunteer fire department before conducting burns.

Cattle should be excluded from burned areas for at least 3 months to allow regrowth of new, tender vegetation.

Prescribed burning is the cheapest, most effective habitat management technique for the Pineywoods. Prescribed burning under a predetermined set of guidelines and plans is the most cost-effective habitat management tool that can be used to enhance plant diversity by stimulating the production of a variety of forb and grass species. It is also effective in controlling low-growing woody plants and maintaining them at the low heights most beneficial to wildlife. Livestock as well as wildlife can benefit from a properly planned and conducted prescribed burn. However, there are legal constraints and liabilities in the use of fire. The land manager should be well-trained and knowledgeable on the proper use of fire before attempting a prescribed burn. Refer to Texas Agricultural Extension Service bulletin "Prescribed Range Burning in Texas" for details on the use of fire as a range management tool. It is often necessary for a pasture to receive a period of deferment from livestock grazing to allow for a build-up of enough fuel (herbaceous plant litter) to carry a fire.

The use of mechanical equipment to control woody plants will typically result in an initial growth of forbs and annual grasses and the resprouting of many woody species. Soil disturbance associated with mechanical controls releases the natural seed bank found in the soil, increasing the quantity, quality, and distribution of plants beneficial to wildlife. However, without periodic follow-up treatments of fire, herbicides, or additional mechanical manipulations, and/or without proper livestock grazing management, these sites will eventually again become dense stands of regrowth brush and trees. Mowing (shredding) areas of herbaceous plants and/or low density woody plants is another form of mechanical treatment. Mowing should be postponed until after the peak of the nesting/young-rearing period of local ground-nesting birds and mammals. One-third of open areas can be mowed per year, preferably in strips or mosaic types of patterns, to

create "edge" and structural diversity.

Biological control is the use of heavy grazing pressure by livestock such as goats to control or suppress woody plants and sheep to control herbaceous weeds. Long-term heavy grazing pressure by goats, which prefer woody browse but will also consume forbs, will eliminate all leaves from woody plants up to a height of four feet. The creation of this "browse line" and the resulting park-like appearance of the woody plant community will have negative effects on the wildlife species that also depend on the low-growing foliage of woody plants for both forage and cover. Heavy grazing pressure by sheep, which prefer forbs, will reduce or eliminate forbs that are also beneficial to wildlife. Under certain management goals, biological control of woody plants and forbs can be a legitimate practice if done correctly. However, it is not normally a recommended wildlife habitat management practice.

Broadcast application of some chemical herbicides can have a significant negative impact on many plant communities and may suppress or eliminate plants other than the target species. If herbicides are used, selective applications, rather than broad-scale applications, are usually recommended to avoid the elimination of plants that are important to wildlife.

Farming Practices: Delaying of shredding or mowing of hay or native grass pastures until after the first of July will usually avoid accidentally killing of young fawns and/or ground nesting birds.

Keep use of herbicides to a minimum. If necessary, spot spraying with a low rate of one pint per acre of 2-4-D is much preferred over broadcast spraying of some of the newer herbicides that last longer. Spray early in the spring while plants are still small, requiring less spray. Many "weeds" are important to wildlife.

To provide weed seeds (ragweed, croton, sunflower, partridge pea, trailing wild bean, etc.) which are the basis of quail, dove, and other seed-eating bird's fall and winter diets, shallow disk 10 - 20 foot wide strips in sandy soil around the edge of brush and woods after the first freeze. This practice will promote growth of these important forbs the following spring and summer.

Timber Management - In the Pineywoods proper timber management is best method to provide a diversity of forested habitats. Proper timber harvests when combined with the periodic use of prescribed fire can create and enhance habitat conditions for a variety of wildlife species.

Upland pine and mixed pine and hardwood stands should be periodically thinned at intervals of 5 to 7 years to maintain open canopy conditions. The intervals between thinnings will vary depending on the productivity of the site and the intensity of the previous harvest. Stands on more productive sites will need to be thinned at shorter intervals, or thinned more heavily, than stands on poorer sites. The interval between thinnings can be lengthened for stands that are thinned heavily (more trees harvested),

versus stands that are only lightly thinned (few trees harvested). Thinning operations allow more sunlight to reach the forest floor that stimulates the growth of herbaceous vegetation and browse plants in the understory. Regular thinnings will provide a continuous supply of browse, and maintain vigorous growth of the crop trees. Pine stands are usually thinned from below which means that the small and poorly formed trees are removed, leaving the larger, better formed trees to continue to grow until the stand is regenerated.

Young pine stands, such as plantations, should be thinned as soon as the timber is large enough to be merchantable, usually around age 12 to 15, depending on the growth of the timber.

A variety of regeneration techniques can be used to ensure that a well stocked stand will occupy the site following the final harvest. Regeneration techniques can be grouped into two broad categories: Even-aged and Un-even-aged. Even-aged regeneration methods create forest stands in which the majority of the trees in the overstory (canopy) are about the same age. Un-even-aged regeneration methods create stands that have a variety of age classes of trees. Even-aged regeneration techniques include clearcut, seed tree, and shelterwood methods. Uneven-aged regeneration techniques include single tree selection and group selection. Even-aged regeneration techniques are generally used to regenerate tree species (such as pines) that require full sunlight to ensure growth and survival of the seedlings. Uneven-aged regeneration methods are usually used to regenerate tree species that can survive and grow in partial sunlight, such as most oaks, or in full shade such as maple, winged elm, or American beech.

Group selection can be used to regenerate pine stands, but usually requires intensive control of woody understory vegetation to ensure pine regeneration. Single tree selection has been used as a harvest technique in bottomland hardwoods forests, but usually results in a reduced component of oak species in the stand. Single tree selection maintains an almost continuous canopy layer, and allows only minimal sunlight to reach the forest floor. Thus favoring the regeneration of tree species that are more shade tolerant than most oaks.

Group selection usually involves harvest areas that are 1 to 5 acres in size, while clearcuts can be significantly larger. If clearcutting is selected, the harvest areas should be a maximum of 40 acres in size. Clearcuts that are 20 to 30 acres in size and have irregular boundaries will be more beneficial than large square or rectangular clearcuts. Harvest areas should be separated by at least 1/4 mile.

Newly regenerated stands such as clearcuts or group selection cuts (in pines and hardwoods) favor species that require brushy habitats such as deer, rabbits, yellow-breasted chats, common yellowthroat, and indigo bunting. These areas provide abundant browse for deer, abundant insects that are an important food source for many birds species, and provide an abundant source of soft mast (fruits) for a wide variety of wildlife species. Newly regenerated stands also provide nesting cover for many species of birds and provide escape cover for many wildlife species.

Regeneration areas provide little in the way of habitat for squirrels and turkeys. Squirrels and turkeys may forage in the edges of regeneration areas, and turkeys may nest in these areas for a few years. Habitat conditions in these areas will begin to improve for turkeys when the stands begin to "open up" in the understory. This usually occurs in 15 to 20 years.

Bottomland hardwood stands should be managed to provide a continuous supply of hard mast (acorns). Acorn production is minimal in stands that are less than 20 years old, and peak acorn production occurs in stands that are between 40 and 100 years old; therefore, the majority of the stands should be at least 40 years old. It is also important to maintain some stands beyond 100 years old to provide "old growth" type habitat. Periodic partial cuttings should be conducted generally on a 10 year cutting cycle. Periodic cuttings will promote vegetative growth in the understory and maintain vigorous growth in the remaining trees.

When regenerating bottomland hardwood stands, group selection or patch clearcuts are generally the harvesting method used. Both techniques are similar in that all stems are removed during the final harvest operation and the new stand will come from sprouts and advanced regeneration present prior to the harvest. The main difference relates to the size of the opening.

To assure that adequate regeneration is present in the stand prior to the final harvest and to increase browse production, periodic light harvests should take place throughout the life of the stand. This will allow the species composition and the stocking level of the stands to be manipulated. These harvests will be similar to the thinnings described earlier, but they should also allow for the development of regeneration of desirable species i.e. oaks, in the understory of the stand. Regeneration from desirable species must be present prior to the final harvest to assure the presence of these species in the future stand.

**Because of the complexities of bottomland hardwood management, a professional forester who is experienced in hardwood management should be employed prior to any harvesting.**

Sawtimber rotations of 50 to 60 years for pine and 80 to 100 years for hardwood are generally more favorable to wildlife species than are shorter pulpwood rotations (20 to 30 years). During any timber harvest, especially regeneration cuts, large mast producing hardwoods should be protected if present. Groups of trees one-half to one acre in size are more beneficial than leaving scattered individual trees. Large (18+ inches) hardwoods of any species are also important as cavity trees and should be protected when and where possible. At least 2 to 3 cavity trees per acre should be retained throughout the life of a stand to provide nest sites for squirrels. Up to 7 cavities per acre may be needed to provide nest sites for most cavity nesting species.

Stream Side Management Zones (SMZ's) should be maintained along all perennial and intermittent streams to protect water quality by reducing sedimentation. By maintaining

large mast producing hardwoods in the SMZ's, these areas can also enhance wildlife values. If the SMZ's are wide enough (50 yards on either side of the stream) they should also serve as travel corridors for many species of wildlife including turkeys.

Forestry Best Management Practices (BMP's) should be followed when implementing any forest management practice. See the attached document for forestry BMP guidelines. Improper timber harvesting practices can lead to poor habitat conditions and can result in a loss of timber production. The use of a professional forester is strongly encouraged prior to any timber management activities.