



TEXAS A&M FOREST SERVICE

Longleaf Pine: Intermediate Stand Management

Longleaf pine (*Pinus palustris*) once covered vast areas in southeast Texas and the southern states. The historical longleaf ecosystem was maintained by a mosaic of naturally occurring fires and would have appeared very park-like. Efforts can be made to manage longleaf pine stands towards historical plant species, improved resilience to environmental pressures, and increased wildlife populations, all while producing high quality timber.



Regardless of the landowner's management objectives, longleaf pine is a long-term venture and requires periodic cultivating treatments as the trees grow. These treatments performed in established pine stands between the stand establishment phase and final harvest are termed "**Intermediate Stand Management**" (ISM) practices. Attention to ISM is more important now than ever as challenges from invasive species, weather extremes and the legacy of past management activities are increasing threats to forest health. Several ISM options exist for the landowner. No matter which is used, ISM activities are always desired and often essential to enhancing growth and vigor of desired plants and animals, as well as providing a balanced ecosystem.

This factsheet assumes that a longleaf stand already exists.

Stand Composition:

In a pre-settler era, appropriate stand composition would have been maintained primarily by fire, varying both by interval and season. Now, however, stand composition has been significantly altered to include aggressive vegetation, canopies of other pine species, an abundance of hardwoods, alterations to groundcover species, dense overstory, and high fuel loads. Longleaf pine and its native plant associates cannot effectively compete with these aggressive, undesirable species for nutrients, moisture, sunlight and space. The current stand composition plays a huge role in the availability, timing and efficacy of ISM practices.

Prescribed Fire as an ISM Tool:

Longleaf pine is very tolerant of fire, even at young ages. All associated plants and animals in a longleaf pine-grass ecosystem are well adapted and dependent on the frequent occurrence of fires. As such, prescribed fire is an essential ISM tool in maintaining ground level species' richness, controlling encroachment by hardwoods and other pines, reducing fuel build up, and diminishing the impact of insects and diseases. Prescribed fire should be conducted on a 3-5 year cycle. Winter burns alone will not adequately control competing hardwoods. Multiple burns may be required over a course of many years to obtain a balanced



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plant assemblage. Spring burns can help control competing hardwoods and also help to remove unwanted loblolly and slash pines, as they are less resistant to fire at a young age than longleaf.

Mechanical and Chemical ISM Tools:

Although essential, prescribed fire, if incorrectly implemented, can cause significant detriment to seedlings and saplings, overall stand yield, soil properties, and associated plant species. In many cases, those stands that have excluded fire and other methods for reducing competing vegetation may have fuel loads too great to apply prescribed burning ISM treatments. Mechanical removal of heavy fuel loads may be required prior to any use of prescribed fire. Trained, experienced professionals must carefully reintroduce any and all use of fire.

Landowners also have the option to control competing vegetation with herbicide treatments. When applied correctly, modern herbicides are effective, safe, and only briefly persist in the environment. In ISM, herbicides are most often broadcasted aerially, though in open stands they can be easily and effectively applied from the ground. Landowners can effectively control undesired vines, shrubs and trees through individual plant treatments such as basal sprays, stem injections or spot treatments to achieve the desired results. For more information, refer to Basal Spray for Woody Control at <http://tfsweb.tamu.edu>.

Stand Density:

Stand density refers to the number and size of trees within a stand. As longleaf pine stands grow, they can soon have too many trees per acre competing for limited resources. If left unchecked, this competition causes growth to slow and health to decline. Stand density should be reduced before stagnation occurs. Luckily, longleaf pine ecosystems are prime candidates for periodic selection harvests that remove only a limited number of trees at a time—leaving residual longleaf trees to perpetuate the ecosystem. This

form of management is called “uneven-aged-management” or “all-aged-management,” and more closely resembles the conditions that would develop naturally over time in a longleaf pine forest. Because the density of the stand is never reduced below a basal area of 50 square-feet-per-acre, uneven-aged-management ensures that the stand always contains canopy-stature trees and produces periodic income (every 8-10 years) from timber products while providing for wildlife needs and maintaining biological diversity. Two particular harvest methods that work best under uneven-aged-management are single-tree selection and group selection. Single-tree selection removes primarily diseased and poor quality trees first. After which, scattered trees of multiple age classes throughout a stand are harvested to produce small (single tree) canopy openings to allow light to the forest floor. Group selection removes trees of all sizes in irregularly shaped patches large enough to allow sufficient light to penetrate to the forest floor (approximately 0.5-1 acre), and if seed-bed conditions are favorable, allows species intolerant of shade to regenerate. Selection systems are difficult to implement and should be directed by an experienced forester to ensure the continued development of trees in each age class and the periodic harvest of mature.

Promote a Healthy Forest:

Please note that unmanaged stands tend to be unhealthy, low-vigor stands that lack the ability to resist damage, as well as recovery quickly from natural events. The best defense against most environmental stressors is a good offense. Manage stands for proper stocking levels of high-vigor, healthy trees. Implement a frequent, low-intensity fire regime suited to the site to maintain pine-grassland ecosystems, timber production, and wildlife populations. Lastly, wildfire can be one of the most damaging occurrences in the forest. ISM, when applied correctly, can dramatically reduce the risk of loss from catastrophic wildfire. To find out more, refer to Timber Management: Intermediate Stand Management at <http://tfsweb.tamu.edu>.

