Timber Management: Intermediate Stand Management

Timber stands are a long-term crop, and as such, they require periodic and frequent cultivating treatments between the time a stand is established at around year 5 and the end of the rotation at around year 35. With **Intermediate Stand Management** (ISM), stand health, vigor and resiliency are improved.

Several ISM options exist for the landowner. Application is influenced by site quality, stand condition, and landowner objectives. No matter which is used, all ISM activities focus on enhancing growth and vigor of desired trees. Some activities result in immediate income; however, most either help grow income to be reaped in later harvests or serve as a natural deterrent to catastrophic loss. When timber production is the main objective, then ISM focuses effort on redistributing resources on those trees that have the best potential to reach high-valued products beyond what would otherwise be produced. If wildlife management is the primary objective, then the composition of the stand will be manipulated in a slightly different way in order to influence, for example, hard and soft mast producing trees. Regardless, ISM achieves these objectives by: 1) manipulating stand density, 2) improving tree form, stem quality and value, 3) managing the tree's nutritional requirements, 4) removing non-crop plants competing for nutrients, moisture, sunlight and space, 5) protecting the stand from environmental stressors.

Stand Density:

Stand density refers to the number and size of trees within a stand. While it may be OK to have many small trees, it is not biologically sustainable to have many large ones. Often, pine stands simply have too many trees-per-acre competing for limited resources. Even pine plantations, which were artificially regenerated by planting a set number of trees per acre, often result in an overly-dense stand. If left unchecked, overcrowding conditions cause growth to slow leading to high risk of loss, and detrimental impact to economic investment. Stand density should be reduced before stagnation occurs. Poor quality trees should be removed (through a practice called thinning) to reallocate site resources to the ultimate crop trees. While it would be nice to wait until trees had attractive economic value (merchantable) before a thinning was conducted, the biological requirements of the site may require that a pre-commercial thinning be conducted before trees reach merchantable size. Pre-commercial thinning is costly, but when applied properly, is a financially sound decision. ISM harvests that thin out merchantable trees are called commercial thinnings and provide some immediate income to the landowner. The productivity of the site and prior management activities affects the timing and intensity of thinning. However, commercial thinning generally takes place between years 12 and 15, with additional thinning at 5-8 year intervals thereafter. For more information on thinning, refer to Thinning Pine Stands at http://tfsweb.tamu.edu.

Tree Quality:

Not all trees are created equal. It's easy to understand that tall, wide trees may be more valuable than short, skinny trees, for example, but value is also dependent upon other factors. Straightness of the main stem, number of knots within the first 17 feet of the tree and deformities resulting from disease, wind, or other environmental factors all impact the market value of the tree as well. Thinning operations improve tree quality because they remove the suppressed, low-vigor and ill-formed trees within the stand. As a result, stand growth is focused on the higher vigor, straighter and disease free final crop trees.

But did you know that the dimensional lumber (2 x 10)

with few or no knots and blemishes is valued higher than wood with knots? Because of this, the industry desires trees with the bottom 16 foot log free of value-depleting knots and blemishes. Knots are caused by branches. Pines tend to shed lower branches naturally when grown in high dense stands. Some pine families also tend to shed branches better than others. Sometimes, however, pine stands benefit economically from operations that control branch growth and their resulting knots such as pruning. Pruning carefully removes all limbs, living or dead, on only the best trees in the stand. A quality pruning process provides a high-quality, high-value 16-foot log that is free of knots and other blemishes. Pruning is labor intensive, expensive, not appropriate for all stands, and should be carefully considered before incurring the cost. For more information on thinning, refer to Pruning Pine Stands at http://tfsweb.tamu.edu.

Stand Nutrition:

Trees must obtain the majority of their nutritional requirements from the soil. Leaves use these nutrients to make food required for survival and growth. Few forest soils, however, provide an optimum supply of all of the essential nutrient elements required by leaves to maximize growth. In fact, on many sites, chronically low levels of available soil nutrients - principally, nitrogen (N), phosphorus (P), potassium (K) and boron (B) - are more limiting to growth in established stands than water.

Because of their small size, use of nutrients by newly planted pine trees is minimal. Still, many pine stands benefit from P fertilization applied at the time of stand establishment. A simple, one-time application of P may last the entire rotation and provide significant volume gains. As trees grow, nutrient demand increases rapidly and soon surpasses the soil supply of nutrients essential for optimal growth. Herbicide treatments, tillage, prescribed fire, and other cultivating treatments that reduce competing vegetation all improve nutrient availability. However, stand nutrition will need to be augmented through fertilization to sustain rapid growth of timber crops on all but the most fertile sites. Simply put, fertilizing forests produces more timber, more quickly and improves return on investment. For more information on thinning, refer to Fertilizing Pine Stands at http://tfsweb.tamu.edu.

Competition Control:

All other, non-crop plants in the stand compete with the crop trees for nutrients, moisture, sunlight and space. This battle has a negative and significant impact on growth of the ultimate crop trees. ISM treatments that reduce competition from other plants (especially hardwoods) can increase crop tree size as well as market value. Competition control is especially important when fertilizer is applied so that only the crop tree receives the full benefit of the treatment. Prescribed fire is a treatment option available to landowners. Frequent, low-intensity prescribed burns reduce the number of non-crop trees and brush. It is beneficial to pine stands for a number of reasons including its provable improvement of wildlife habitat.

In stands where burning is not applicable, landowners have the option to control competing vegetation with herbicide treatments. When applied correctly, modern herbicides are effective, safe, and persist in the environment for only a brief time. In ISM, herbicides are most often broadcasted aerially, though in open stands they can be applied from the ground. Landowners can also effectively control undesirable vines, shrubs, and trees through individual plant treatments. Herbicides may be applied as basal sprays, stem injections, and spot treatments to achieve the desired results. For more information on thinning, refer to Basal Spray for Woody Control at http://tfsweb.tamu.edu.

Stand Protection:

Trees are constantly at risk from numerous environment stressors such as storm events, drought, fire, insects, disease, and pollution. The ability to resist these stressors is directly dependent upon tree health, vigor and stand composition. Unmanaged stands tend to be unhealthy, low-vigor stands that lack the ability to resist damage, or 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. Stands should be managed appropriately from the start with careful consideration to genetics, stocking levels and nutrition. However, ISM also provides the necessary tending required to reduce risk of loss from environmental stressors. Wildfire can be one of the most damaging occurrences in the forest. ISM, when applied correctly, can dramatically reduce the risk of loss from even catastrophic fire.