

# GROWING FOREST TREES

## TIMBER MANAGEMENT

One forestry objective of many landowners is timber production. Even lands managed primarily for wildlife, recreation or water protection can produce timber. Forest management can be both environmentally friendly and profitable.

**When selecting how to operate your forest, you need to carefully assess:**

- ?? Your goals,
- ?? Your financial and physical limitations,
- ?? The size, condition and capabilities of your forest,
- ?? The availability of technical and contractual services in your area, and
- ?? Expected markets (Various publications on a successful timber sale are listed below the assessment). It is strongly suggested that a forestry consultant be used to provide current market values for timber. The consultant fee is cost-effective in selling a landowner's timber.

Well-managed forests generally have several common features:

- ?? Tree species that are suited to the local climate, soils and markets,
- ?? *Crop Trees* with adequate room to grow,
- ?? Minimal numbers of damaged, diseased or insect-infested trees,
- ?? Protection from fire and destructive grazing,
- ?? Easy access,
- ?? Best Management Practices (BMPs) to prevent *soil erosion* and *sedimentation* to protect water quality,
- ?? Boundaries and corners are clearly marked and maintained, and
- ?? A written forest resource management plan that considers all resources that govern activities.

For the new *BMPs* update - Call the Georgia Forestry Commission or visit <http://www.gfc.state.ga.us>

For tree species and stocking information, call your local Georgia Forestry Commission office or another forestry professional. Normally, the Georgia Forestry Commission recommends 500-700 trees/acre (these stocking rates are subject to change based on the objective of the landowner).

## **The Types of Timber Stands**

### **Even-aged stands**

Certain tree species grow in *even-aged* stands, where all the trees are approximately the same age. Strategies for managing even-aged stands are best suited to tree species that do not grow well in the shade. Normally, these stands are harvested by techniques which allow maximum sunlight to reach the forest floor.

### **Two-aged stands**

While similar to even-aged stands, these have two different age classes.

### **Uneven-aged stands**

Trees of more than two ages and size classes are present in *uneven-aged* stands. Species which thrive in full or partial shade are best suited to these stands. These methods do require more access roads and trails when planning for timber harvests. Extreme care must be used to prevent damage to trees left after each selective harvest.

Uneven-aged stand management is complex. It is better suited to larger forests, particularly where the owner wants repeated, frequent timber harvests and income.

## **Establishing and Managing Timber Stands**

Linking timber harvesting, regeneration, and intermediate stand management treatments in a logical sequence to meet your goals is complex. Generally, management practices fall into three categories depending on the age and condition of the forest:

1. Forest establishment or regeneration,
2. Intermediate stand management practices, and
3. Harvest systems.

## **The Young Stand**

Establishing or regenerating a forest can be achieved by artificial means, primarily planting trees, or by natural methods, which rely on seed, sprouts and/or naturally occurring seedlings. These practices are used to establish the forest with desirable trees.

1. Site Preparation

Site preparation can be the most intensive, soil disturbing activity done to your property. BMPs must be followed to protect water and soil quality. Removing undesirable vegetation or preparing a seedbed may be needed. Depending on the soil type, soil moisture, geographic region and the type and density of the competing vegetation, different methods can be used to clear the site. These include prescribed burning, herbicides, heavy equipment or manual labor.

## 2. Stand Establishment

This technique must be identified in pre-harvest planning.

### Natural regeneration

Relies on available seed, stump sprouts and/or existing seedlings to produce the new stand. Success depends on whether there is adequate seed, seedling or sprout supply; adequate moisture; a well-prepared seedbed; and control of competing vegetation. Careful planning is required to ensure success.

### Artificial seeding

Seed can be sown by either spreading from ground-level or broadcasting by helicopter over the site. Success will be determined by many of the same factors that affect natural regeneration.

### Tree planting

This lets you pick the type of tree (species) and the spacing of the seedling and allows you to use genetically superior seedling stock. It will be successful if the selected species are well adapted to the site, and high-quality, healthy seedlings are carefully planted. In rare instances, seedlings may need to be treated with insecticides or fungicides to protect from early death. Tree planting may be done by hand or machine. Planting on the contour is advised to limit erosion and protect water quality.

## 3. Competing Vegetation Control Following Planting

Grasses, brush and annual or perennial weeds, which choke out or stunt the growth of seedlings, can be controlled by hand, mechanical means or herbicides. Extreme care must be used to avoid water contamination with pesticides.

## 4. Fertilization

Fertilization is rarely needed during the first four years after planting.

## **The Middle-Age Stand**

Your forest will be healthier and more productive if it is managed by manipulating: the stocking (number of trees per acre); species composition; competition levels, and the use of prescribed burning. Generally speaking, trees or competing vegetation that do

not contribute to your objectives for timber production, wildlife, aesthetic or recreational goals can be eliminated in favor of more desirable components in your stand.

### 1. Competing Vegetation

This can be done by the use of hand tools, mechanically, prescribed burning, or chemical methods. Usually brush and herbaceous weeds are not marketable; therefore, they are killed in place. As they decompose, the recycled nutrients become valuable to your forest. Keep in mind that many of these weeds have some benefit to wildlife.

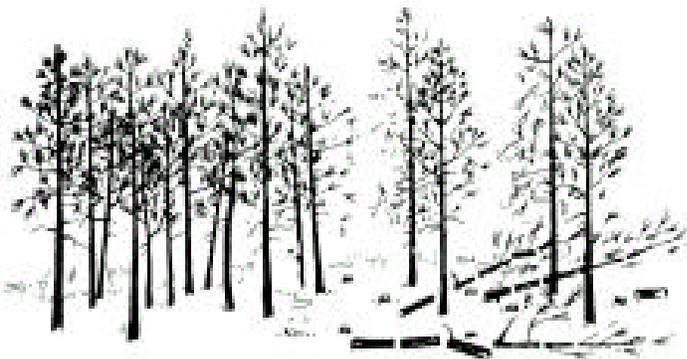
As a method to eliminate less desirable trees, concentrate on removing shade produced from competing vegetation. In most cases, less desirable vegetation sprouts grow rapidly, quickly overtopping planted seedlings. Without release, crop tree seedlings' early growth can suffer, or they may die.

### 2. Thinning

When competition begins to occur, thinning is usually done in even-aged stands when the tree crowns become so dense the trees start to shade each other. Failure to thin will cause the growth rate and vigor of the crop trees to diminish. Also, unthinned stands are more vulnerable to disease and insect infestations and will take longer to reach marketable size.

Enough space is needed for the development of selected crop trees. Pre-commercial thinning removes small trees, which are not yet marketable. In older stands, thinning may produce some income from the sale of the removed trees.

By allowing more sunlight to reach, not only the total crown of selected crop trees, but also the forest floor, low vegetation will grow and provide food and cover for many wildlife species.



### **Thinning**

### 3. Timber Stand Improvement

Timber stand improvement (TSI) is a cutting or culling of undesirable species, usually in a sapling stand of less than 4-inches in diameter. By removing undesirable species and poorly formed, diseased or insect-infested trees, the species composition and stand quality will improve. Also, TSI will increase the growth rate of the desirable trees remaining.

Undesirable trees may be killed in place by herbicides, prescribed burning, or removed to use as firewood. Improvement cuttings are done in older stands to accomplish the same result, but the stems removed are sold.

#### 4. Prescribed Burning

This lowers the risk of wildfire, as well as the population of undesirable wood species. Many species, such as most pines, are tolerant of “cool” fires under controlled conditions. Fire can be used to eliminate buildups of leaves, needles, and other fuels that can ignite and cause a major wildfire, as well as removing less fire-tolerant tree and brush species. In addition, prescribed burning returns nutrients to the soil.

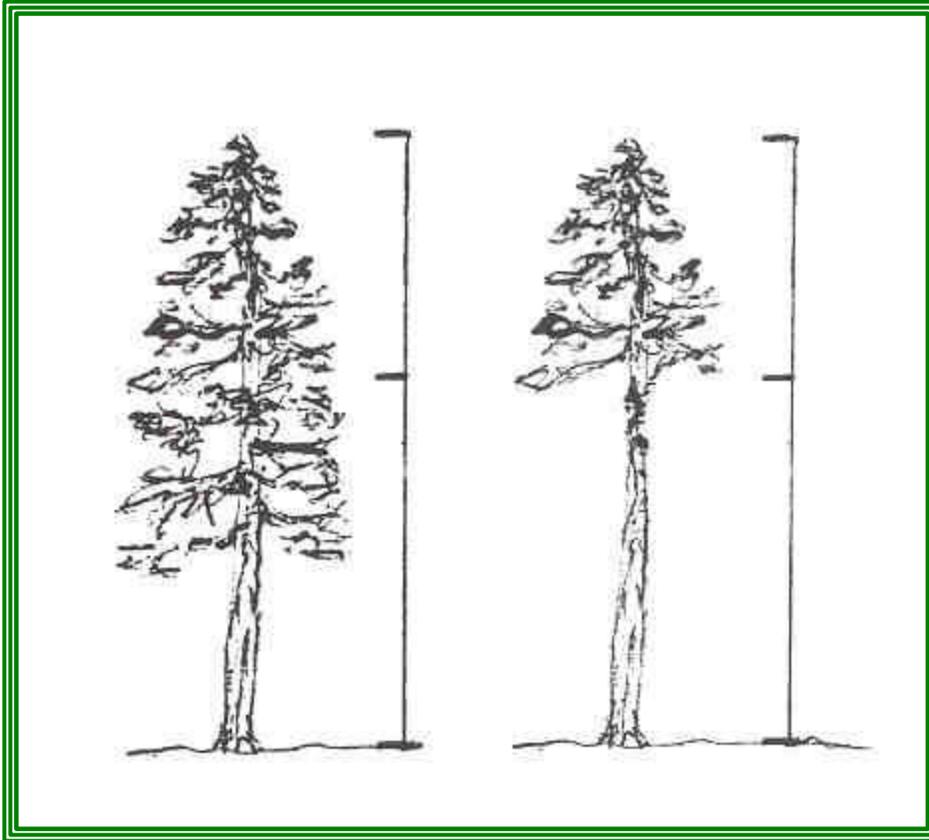
An added benefit to prescribed burning is the stimulation of many herbaceous species of plants that provide food and cover for certain wildlife species.

**In Georgia, there are specific guidelines for prescribed burning. In order to burn, you must get a burn permit.**

**Call your local Georgia Forestry Commission office for more information.**

#### 5. Pruning

Removing persistent low branches improves wood quality by increasing the percentage of valuable clear and knot-free wood. Pruning is best done when branches are less than 2-inches in diameter and the stem diameter is less than 4-inches. But you should never prune higher than two-thirds of the total height of the tree.



### Pruning

#### 6. Fertilization

Intermediate aged stands may need nitrogen and phosphorus to increase the growth and yield of the forest. When there is enough sunlight, water and other nutrients, trees - just like corn - will respond to nitrogen with larger, more productive foliage. Conducting a foliar test will provide information on fertilization rates. It is best to talk with a professional forester to determine the amount of fertilization needed on a specific timber stand.

**Before applying any type of fertilizer, have the foliage analyzed to determine fertilization rates.**

**Please read about Best Management Practices before applying fertilizer. Following BMPs will help to avoid violations of the Clean Water Act.**

7.

#### Pine Straw Harvest

Harvesting pinestraw, which can begin in plantations as early as 8 years old, can provide early regular income until timber harvest in stands that are properly managed.

(Note: CRP plantations cannot be harvested until the contract expires.) If anything other than an occasional harvest (1-2 times over the rotation) is considered, then intensive management should be implemented.

To effectively manage for pinestraw, 90% of the understory vegetation needs to be controlled. All stands need crown closure to reduce the invasion of weeds on the site. Applications of approved herbicides at release rates can achieve this affect.

Repeated removals of pinestraw without fertilization on forested sites is not recommended. Stand growth will decline without fertilization. An increase of straw production and stem growth can be expected with fertilization.

The greatest needle fall is during the autumn months. Therefore, the best time to rake straw is in late winter or early spring.

It is advised the landowner has a contract with the producer, so that both the landowners and the producer's rights are protected. Producers raking pinestraw are required by law to have a Certificate of Harvest on them for each landowner on which straw is being harvested. These certificates can be obtained from the Georgia Forestry Commission.

### **Harvesting the Mature Forest**

Several options can be used that relate to your forest regeneration planning strategy. Actual cutting of trees can be by hand or machine felling; moving (skidding) of the stems to a loading area (deck) by machine or livestock; and the loading and hauling of the cut timber to market.

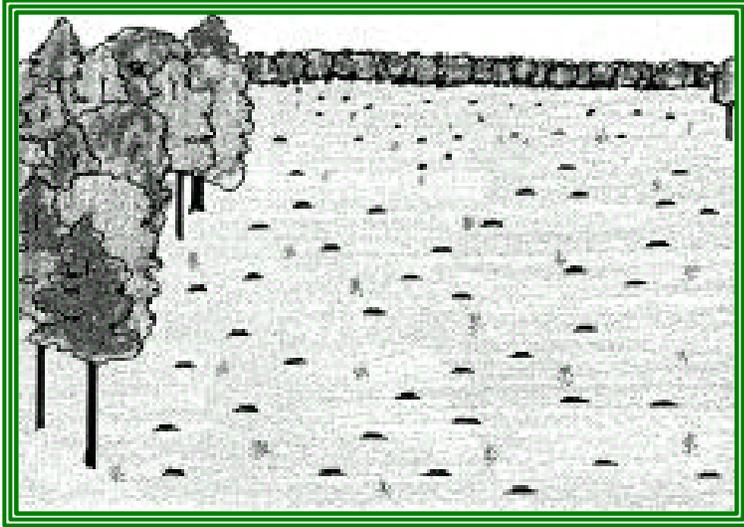
Timber harvesting, skidding, and hauling on forest roads and trails are potential causes of soil erosion, soil degradation and sedimentation. With the assistance of a professional forester, you can make a pre-harvest plan that will result in a good timber sale and harvest contract. A list of Master Timber Harvesters can be obtained from the Georgia Forestry Commission or the Georgia Forestry Association.

Before harvesting timber, it is strongly suggested that a forestry consultant be used to determine timber volumes and provide current market values for timber. The consultant fee is cost-effective in selling a landowner's timber. The forestry consultant determines the harvestable products and volume by a timber cruise. Cruises should be conducted before timber sales to estimate the value of the stumpage (standing timber).

#### **Clearcutting**

This removes the entire marketable portion of the stand in one cutting. It is the most efficient and easiest to administer and is appropriate for mature stands or where the stand is of poor quality and even-aged regeneration is desired.

While clearcutting creates a drastic landscape change that some people object to, many valuable species must have full sunlight for regeneration. In addition, it is beneficial to many wildlife species. However, it is critical that you follow the BMPs when clearcutting along stream sides.



### **Clearcutting**

#### Seed tree

This method also produces an even-aged forest. It is similar to clearcutting, but 4 to 20 high quality seed producing trees are left per acre to naturally re-seed the site after harvest. It is crucial to plan the timing of the harvest and to assure adequate seedfall. Planning is also required to remove the seed trees after regeneration, since loggers are reluctant to return where there are few trees left. Risks include either not enough seeds or too many seeds, resulting in an understocked or overstocked stand.



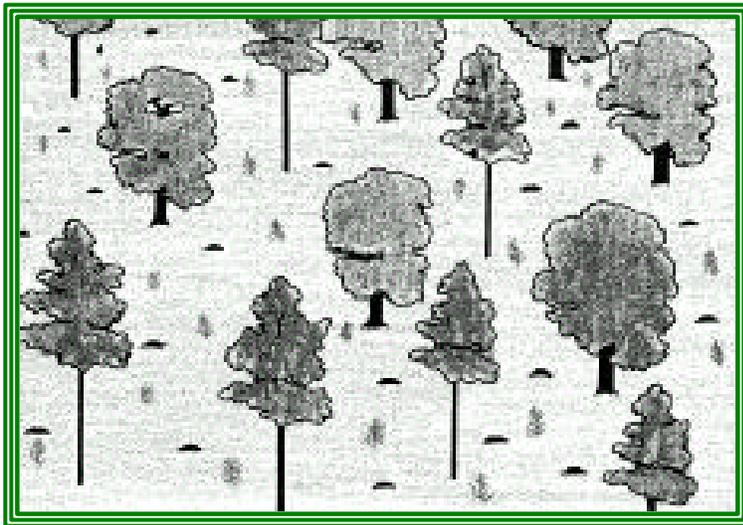
### **Seed Tree**

#### Shelterwood

This harvest method leaves 21 to 60 seed trees per acre, which can be described as a heavy seed tree harvest. This harvest is a preferred even-aged natural regeneration

system for non-prolific seed producing species and as a visually appealing system for hardwood and conifer species.

A shelterwood harvest provides an abundance of seed and shelter for seedlings, as well as residual shade to control weeds. Since there is a larger number of trees left, loggers are more willing to return and remove the shelter trees after regeneration is established, usually within three to five years.



### **Shelterwood**

Shelterwood with reserves (two-aged stand)

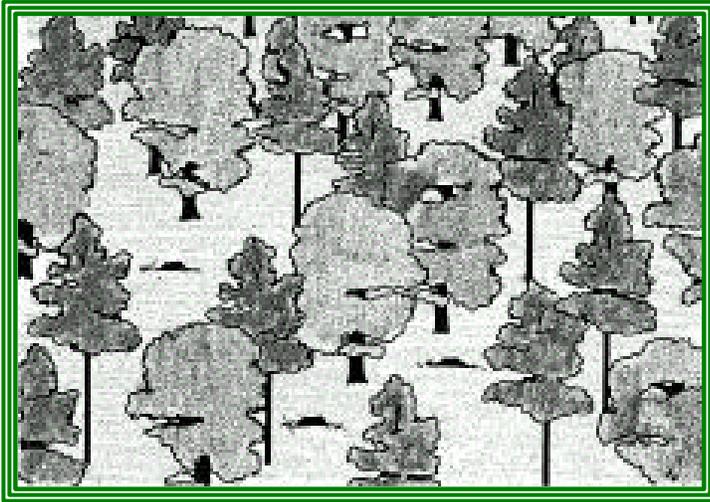
Also called deferment cuts, the shelterwood trees are left to mature until they grow larger and more valuable.

### Selection

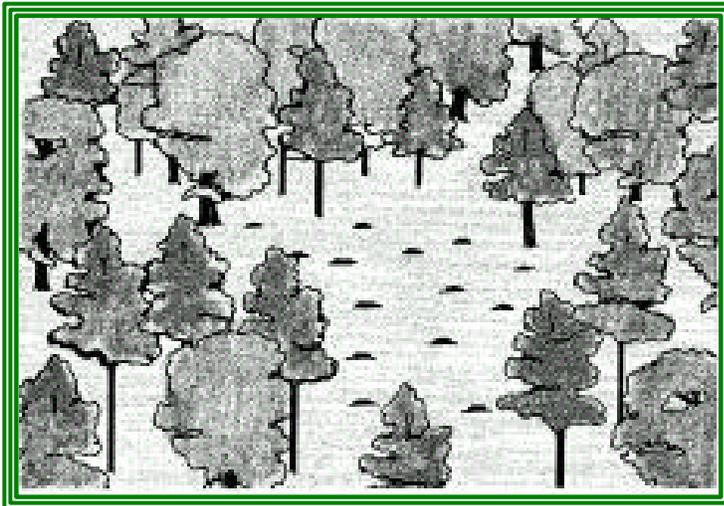
This system regenerates uneven-aged stands of shade tolerant tree species. Single tree selection removes scattered individual trees, while group selection removes scattered groups of trees to create openings of 1/4 to 1/2 acre in size.

Selective harvest does not work with valuable shade intolerant or moderately shade tolerant species, including many pine and quality hardwoods. While this method removes financially mature and high risk trees, care must be taken to not remove all the biggest and best trees, leaving poor quality trees behind. This practice results in a badly degraded forest with little timber value.

There are many advantages to selective harvest, including frequent income and visual attractiveness. A major disadvantage is that it requires more roads and trails, which greatly increases the potential for soil erosion and sedimentation.



*Single tree*



*Group tree*

### **Aesthetically Pleasing Timber Harvesting**

The impacts of timber harvesting can be minimized to protect the aesthetic quality of your land. With proper planning and communication with timber harvesters, your objectives and goals for your forestland can be achieved.

**Aesthetically Pleasing Timber Harvesting Practices include:**

- ?? Timed to avoid conflicts with seasonal outdoor activities,
- ?? Method and equipment to be used is selected to limit damage to residual stand,
- ?? Harvest area shaped and sized to limit visibility from public roads,
- ?? Skidding lanes and wood roads maintained to limit erosion and impact on public roads, and
- ?? Loading decks should be kept free of limb and brush piles.

**Other considerations**

Wildfire, insects, diseases and overgrazing are destructive to your forest. Frequent visits by you and a professional forester are recommended to maintain firebreaks, provide evaluation of your forest's health and vigor, and protect your investment.

**Soil Productivity Related to Timber Harvesting**

By following BMPs during all phases of forest operations, soil productivity is maintained. Soil productivity can be enhanced with proper fertilization and sub-soiling of compacted soils.

**Additional Information:**

Georgia's Virtual Forests - [www.gaforests.com](http://www.gaforests.com)