

Forest Management Alternatives for Private Landowners



Forest management can be a profitable and enjoyable enterprise if you:

- Follow a forest management plan that meets your ownership goals and objectives.
- Seek and follow the advice of a professional forester.
- Use a professional forester to administer the timber sales.
- Protect the environment during harvest operations by following Mississippi best management practices.
- Keep your land productive by regenerating your timber after final harvest.
- Take advantage of tax incentives and financial assistance programs.
- Maintain good business records to guide you in making financial decisions.

Why You Need a Forest Management Plan

Forestry requires a long-term commitment of resources. Before making a forest management decision, you should consider your ownership goals and objectives. Why do you own timberland? What do you want your forest to provide? How will you accomplish this?

A written forest management plan is one of the most important documents to have about your timber. Such a plan includes the names of the owners, a description of the property, a map of timber types and other features, ownership objectives, and a schedule of activities. As the owner, you determine what you want to do on your forest. A professional forester then develops a schedule of activities to accomplish your objectives.

The planning horizon for a forest management plan is usually 5 to 10 years. Beyond that period of time, the plan needs to be updated. Of course, should some disaster drastically alter your forestland, a new plan would be warranted at that time.

With a plan, forest activities are tailored to meet your management objectives and goals. Many forest management objectives are compatible. For instance, you can produce timber for a profit and still have wildlife and recreation. The management plan describes the current conditions and needs of your timber, provides a timetable for prescribed practices, and estimates the costs and returns for anticipated products during the production period (called rotation length for even-aged management, or cutting cycle for all-aged management). Your ownership objectives will determine the type and intensity of prescribed management practices, the desired tree species and product, as well as the time, investment, and protection needed.

Following a management plan can reduce the cost of good forestry because you can choose practices that fit your ownership objectives, timberland conditions, and budget. For instance, many landowners harvest their mature timber without prior planning. The result may be settling for less than what the timber is worth, site damage by not following Mississippi best management practices, or lack of adequate regeneration. Proper planning will avoid these and other costly mistakes.

As you decide how much money you can afford to invest, don't overlook the tax benefits and cost-share programs available to you. You may be able to afford more than you think. There are tax provisions to help you lower or recover costs including capital gains tax treatment, timber depletion deductions, amortization recovery of reforestation costs, and investment tax credit for reforestation. Meanwhile, you may be eligible for government incentive programs that will help pay for certain management practices. These incentive programs are available through the U.S. Department of Agriculture or the Mississippi Forestry Commission.

Forest landowners may obtain a written management plan from a forestry consultant or from the Mississippi Forestry Commission if they qualify for the Forest Stewardship Program. Having a plan is your "roadmap to success" for achieving your forest management goals while

providing enjoyment to you and your family. Furthermore, once you have a written forest management plan, you may enroll your property as a Certified American Tree Farm. You will need to schedule a Certified Tree Farm inspection of your property. Contact Dr. John Auel (662-325-7948 or jba9@msstate.edu), assistant Extension professor in the Department of Forestry at Mississippi State University.

Intermediate Stand Activities

Clearly, forests take a long time to mature. But there are numerous intermediate stand activities that can protect and help your forest grow. These include fire protection, thinning, brush control, prescribed burning, timber stand improvement, and eliminating invasive plant species.

Fire protection includes the installation of firebreaks along the perimeter of your forest property, between timber types, or even through stands. These are called breaks because vegetation is removed by disking or plowing to expose bare ground. Soil does not burn, so bare ground will prevent ground fires from spreading onto or across your property. Furthermore, these firebreaks can be used to provide additional access to your property, which can be useful during hunting season. In addition, firebreaks can be used to grow supplemental plantings for wildlife, although this will lessen their effectiveness in fire prevention.

Thinning pine stands provides numerous benefits to forest landowners (**Figure 1**). To begin, pine stands are frequently planted to high densities. The intense competition from neighboring pine trees forces all the trees to grow tall and shed lower branches, which is called natural pruning.

Such trees have the desirable clear boles for sawtimber and poles, which are very valuable products. However, by midrotation, competition for water, nutrients, and sunlight becomes extreme. The weaker trees die, as the site cannot support all the trees originally planted. A primary objective of thinning is to remove weaker trees beforehand, and thereby recover some of the investment of planting them. This is called capturing potential mortality. If you didn't thin the stand, the weaker trees would die anyway, and you as landowner would be paid nothing for them.

Thinning directly promotes stand vigor. After thinning, the remaining trees have more site resources—water, nutrients, light—to grow more vigorously. There are other benefits to thinning. Removing the weaker trees, namely shaded, crooked, diseased, or forked trees, improves your overall timber quality. The remaining trees will be of higher quality and continue growing into more valuable products. In addition, these residual trees will grow more vigorously, which is their primary defense against pine bark beetles. Healthy pine trees will have good sap flow, which can expel attacking bark beetles, whereas severely stressed trees will be overcome by bark beetle attack.

The residual density after thinning presents the landowner an opportunity for a decision about the final harvest. Maintaining a higher residual density will favor timber production in the long term. If the landowner has a stand of well-formed trees, higher residual densities will encourage a little slower growth and more self-pruning. These factors are useful to encourage the growth of pine poles, a high-valued product. A lower residual density will encourage more rapid growth and more wildlife habitat.



Figure 1. (left) Loading chip-n-saw logs as part of a second thinning in a pine plantation. (right) After the second thinning, trees are evenly spaced, with more sunlight, water, and soil nutrients for remaining trees.

As mentioned, thinning lets more sunlight into the stand. Encouraging wildlife habitat after thinning is a process called quality vegetation management. The first step to quality vegetation management is removing unwanted hardwood competition with selective herbicides. Removing unwanted hardwood competition in your pine stand will also allow the pines to grow faster to sawtimber size, permitting you to make the final harvest sooner.

After controlling unwanted hardwoods with selective herbicides, the second step to quality vegetation management is to do a prescribed burn. Using a prescribed burn will remove the accumulated needles, branches, and cones in the forest floor (**Figure 2**). This will allow the soil to become warmer from sunlight and stimulate the seedbank of native forbes and annuals to germinate. This lush understory can provide nutritious plants for wildlife all through the growing season, as well as cover for brood-rearing and hiding from predators. By varying the frequency of prescribed burning, you can manage for different game animals. Quail prefer burning every other year, whereas turkey prefer burning every 2 to 4 years. Deer are more adaptable and will thrive under either burning regime.

Hardwood timber also benefits from intermediate stand activities, particularly timber stand improvement. Hardwood stands often include a variety of tree species, some of which are more valuable than others. Usually, the oak species are the most commercially desirable, and occasionally ash or hickory. Since hardwoods take much longer to mature than pines, removal of unwanted species is an important management objective. If the trees are large enough for commercial removal, a thinning for pulpwood can be done. However, if the trees are too small for that,



Figure 2. Fires set under specified conditions are called prescribed burns. These fires remove understory plants and forest floor, encouraging germination of forbes for wildlife habitat.

unwanted hardwoods can be eliminated with herbicides through stem injection. Timber stand improvement provides benefits in hardwood stands as thinning does in pines. These benefits include improving timber quality, stand vigor, and wildlife habitat.

Finally, keeping your forestland clear of invasive plant species is very important. Nonnative invasive plants are extremely aggressive and displace (kill and/or prevent regeneration) native vegetation on a site. Controlling invasive plant species requires complete elimination on your property. This requires vigilance and immediate action if invasive species are found. Most control methods involve using herbicides over several years. Nonnative invasive plant species are extremely tough; there is no herbicide treatment available that will control invasive plants with only one application. Since these plants spread quickly, half-measures at control are simply a waste of money.

Harvesting and Marketing Guidelines

Intermediate stand activities and harvesting are crucial to sound forest management; these stand manipulations help you meet your landowner objectives. Marketing timber shrewdly is essential if you want to receive the best price and be satisfied with the logging operation. However, achieving this end requires both smart and hard work. You may only experience one or two timber sales from your property, but loggers and timber buyers do this routinely. This places you at a distinct disadvantage when marketing timber. Use the following guidelines to turn the balance of knowledge and experience in your favor.

Guidelines to Market Your Timber

1. Follow a timber marketing procedure. Don't just sell your timber—you need to have a strategy when marketing timber. Use a professional consulting forester when preparing a timber sale. A consulting forester's commission may be 6 to 10 percent of the sale price, but they achieve 20 to 30 percent higher prices than landowners who sell on their own. Mississippi State University maintains a list of registered foresters in Mississippi at www.cfr.msstate.edu/borfl.
2. Become knowledgeable about market conditions, measurement units, and prices. Prices are cyclical in nature and will vary with weather conditions and access. Statewide average price trends are available through the MSU Extension Forestry site at <http://extension.msstate.edu/content/timber-prices-2013-present>.

3. Know how much timber you have and where it is located. If a timber buyer realizes you don't know what you have, he or she will bid accordingly ("How little can I pay to buy this timber?").
4. Accessibility on the property and proximity to markets are very important in considering the costs of logging. Having good access roads on your property will generate more interest in bidding for your timber.
5. Get the best price by advertising for competitive bids. Sealed bids give buyers one chance to offer their best price. However, this strategy only works to your advantage when you follow the previous steps.
6. Improve the condition of your timberlands with each harvest. Thinning and timber stand improvement are opportunities to remove cull trees, allowing better and healthier trees to grow bigger. With intermediate cutting, price is not the sole driving factor. Finding someone willing to do this work is often the greatest challenge. Scheduling thinning or stand improvement when doing a harvest is an excellent strategy.
7. Maintain good records of timber sale volumes, income, and costs. All of this information is useful when preparing taxes, especially to make sure you don't pay more tax than necessary.
8. Coordinate the efforts of a forester and an attorney in drafting a timber sale agreement or contract. The timber sale prospectus should have all the vital information regarding the tract: ownership, inventory, location, access, payment procedures, and conditions of the sale. These conditions should include following Mississippi Best Management Practices to protect water quality.
9. Check your tax situation before you make a timber sale. Taxes are paid on timber revenues, less the sale costs and timber basis. If you don't know your basis, have a forester figure this before the sale. Also, your timber ownership category determines which accounting rules apply for your tax calculations.
10. Include a "hold harmless" clause in the sale prospectus. If you do not receive decent bids on your timber, your forester may advise you to wait for an improvement in the market. Allow yourself some flexibility when placing timber on the market.

Site Preparation and Regeneration Alternatives

To a forester, the methods used to harvest and regenerate a forest stand are called silvicultural systems. To a private landowner, these harvesting and regeneration methods are management alternatives. A silvicultural system is a planned program to establish a new crop of trees and to enhance their growth.

Site Preparation

Site preparation is necessary in forest regeneration, whether you plant trees or leave mature timber on the site to seed in. It can be expensive. It is a good idea to begin planning for regeneration before you harvest your timber. A forester can provide an estimate on the cost for regeneration and potential timber taxes. This will allow you to know how much to save from timber sale proceeds to keep your forestland in production.

In general, site preparation activities kill residual vegetation on the site after logging and clear debris to expose the soil. Exposing soil is necessary for regeneration when planting trees or allowing natural seedfall to regenerate the site. Usually, site preparation involves mechanical or chemical means (**Figures 3 and 4**). In mechanical methods, heavy equipment clears debris, and tillage may be used to prepare the planting site. With chemical methods, herbicides are sprayed to control unwanted vegetation remaining on the site. Herbicides are usually cheaper to use and more effective in controlling vegetation. Prescribed burning in the summer to help remove debris can be used with either method.

Harvest and regeneration should not be considered as separate practices; timber harvesting impacts regeneration. The method used to harvest the final crop plays an important part in starting the next crop. The practices of harvesting and regenerating timber stands are classified according to the type of harvest cutting used. This includes natural and artificial regeneration.

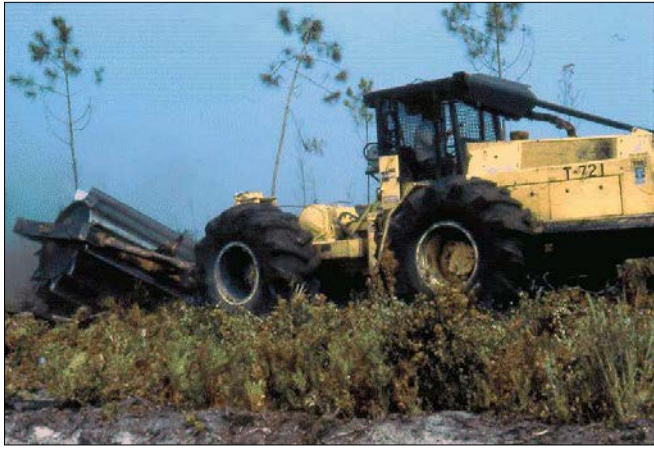


Figure 3. (above) Mechanical site preparation with a drum chopper. The chopper drum can be filled with water to enhance its effectiveness.



Figure 4. (right) Aerial application of herbicide to control unwanted vegetation in site preparation.

Natural Regeneration Methods

Natural regeneration uses existing trees to provide seed to germinate into the next crop of trees. Natural regeneration systems are even-aged or all-aged. Even-aged management encourages reproduction at the same time, producing a new crop about the same age. These systems include strip clearcutting, seed tree, and shelterwood. By contrast, all-aged systems manage trees of all sizes and ages. Selection cutting of single trees or small groups of trees is used in all-aged management.

Even-aged: Strip Clearcut System

Clearcutting all the trees on a site is an acceptable approach to regeneration for species that demand full sunlight. The most suitable species should have light, wind-blown seed or be prolific sprouters. Examples include loblolly and shortleaf pines, ashes, cottonwoods, and yellow poplars. When using clearcutting for natural regeneration, seedfall from adjacent mature timber provides the source for reproduction. As such, clearcut strips need to be narrow (not to exceed 200 feet wide) and established perpendicular to prevailing winds, on the leeward side of a forested stand. In this manner, seed from mature trees will blow across the site.

Even-aged: Seed Tree System

With the seed tree method, most mature trees are harvested, leaving several seed-producing trees per acre scattered evenly across the site (Figure 5). Seed trees should be sawtimber-sized and good seed producers. Seed trees are selected several years before the final harvest. They are prepared for seed production during a final thinning operation to give them more growing space for crown and cone development. The seed-tree system is used for light-seeded species that frequently produce good seed crops. Examples include loblolly or shortleaf pines, ashes, or yellow poplars. Seed trees are left several years to allow adequate seed germination and seedling survival before final removal.



Figure 5. Natural regeneration of shortleaf pines by the seed tree method. Notice the pine regeneration under the canopy of mature trees.

Even-aged: Shelterwood System

The shelterwood system is similar to the seed tree method, but more trees are left. The shelterwood system is most suited to heavy-seeded species or those with irregular seed crops, such as longleaf pines or oaks. The overstory trees are removed in a series of two or more harvest cuts. During the preparatory thinning, trees of sawtimber size are selectively marked and cut to favor the better, dominant seed-producing trees that will shelter the new crop.

The shelterwood system is the most versatile natural regeneration system because you have many opportunities to market the old stand and regenerate the new crop. Trees can be removed in several thinnings over time, depending on regeneration and market conditions. The shelterwood trees must have enough volume to make logging economical. If market conditions are bad, the growth rate and volume of the crop trees are sufficient to justify carrying them for many years. There should be enough seed distributed across a stand to assure rapid regeneration. Since the new crop is established under the old crop, there is no delay between the final harvest and the start of the new crop. In fact, the new crop may be several years old before the high value shelterwood trees are harvested.

All-aged: Single-Tree or Group Selection Systems

The single-tree or group selection systems are natural regeneration methods for all-aged forest management (**Figure 6**). Individuals or small groups of trees are harvested to create small openings with sufficient sunlight to allow seed germination or root sprout development, usually ½ to 2



Figure 6. All-aged natural regeneration of loblolly pines. Notice the variety of size classes, from regeneration to pulpwood to mature timber.

acres in size. These selection systems can be used for southern pines or hardwoods. Under all-aged management, cutting is done periodically across the forest for thinning, harvest, and regeneration. With the help of a forester, these methods can be desirable alternatives for landowners because cutting cycles provide periodic income and the cost of natural regeneration is relatively low.

However, all-aged forest management has disadvantages, too. Harvest volume per acre is lower than with even-aged systems. Also, improper use of the selection system can lead to “high grading.” High grading involves removing the most commercially valuable trees, leaving trees of poor condition and quality. Quality seed trees must be left in openings or around the perimeter to provide seed sources, while the poorest quality trees should be removed to provide space for the new crop.

Artificial Regeneration

Artificial regeneration involves clearcutting a large area at one time and planting trees by hand or machine (**Figure 7**). Artificial regeneration of pines is common and is a very effective method of regeneration. A few hardwood species can be planted successfully, but they require intensive cultivation for many years. Artificial regeneration is the only alternative in stands that do not have enough desirable species for natural regeneration.

Clearcutting and planting has several advantages over natural regeneration systems when properly used. Large harvest volumes reduce the proportion of money spent on logging costs, increasing the landowner’s in-



Figure 7. Artificial regeneration of shortleaf pines showing machine planting of retired cropland.

come from a sale. Clearcutting followed by chemical or mechanical site preparation increases seedling survival and early growth for prompt, successful regeneration of the new crop. Planting ensures the proper spacing for the growing space and improves the growth rate of individual trees. Finally, artificial regeneration allows the landowner to select and use genetically superior seedlings than originally found on the site.

Financial Assistance Alternatives

There are incentive programs that will pay a portion of the cost for many forest management activities. The state or federal government usually administers these. Generally, the landowner can enroll in only one of these programs for any given acre. The landowner must sign a contract before beginning forest operations. Once the contract is approved and the operation is completed satisfactorily, the landowner will be reimbursed at the specified rate.

The Mississippi Forestry Commission administers the Forest Resource Development Program (FRDP). This program is funded from timber taxes that are paid at harvest. A portion of those funds are returned to the county, prorated to the volume removed. These funds are available to assist forest landowners with a variety of management activities, including site preparation, competition release, prescribed burning, and regeneration.

In addition, the Natural Resource Conservation Service administers the Environmental Quality Improvement Program (EQIP) and the Wildlife Habitat Improvement Program (WHIP). Both EQIP and WHIP assist with practices that enhance quality vegetation management and other environmental objectives.

The Farm Service Agency administers the Conservation Reserve Program, which promotes the retirement of erodible land from farming into permanent cover, such as pasture or forest. Similarly, the Wetland Reserve Program encourages the retirement of marginal farmland to enhance wetlands. The U.S. Fish and Wildlife Service has programs that focus on wildlife habitat restoration, especially for threatened or endangered species.

Timber Tax Considerations

Forestry is a capital-intensive activity, and both federal and state governments have incorporated more generous tax codes for forest landowners who demonstrate a profit motive in managing their timber. One of the easiest ways

to demonstrate a profit motive is to have a written management plan with your profit motive listed as the first objective. Also, a financial analysis can demonstrate your profit motive, even though your timber may not be mature and ready for harvest.

Taxes collected on timber sales are subjected to the capital gains tax rates (provided the timber was inherited or owned more than 1 year), which are lower than the ordinary income tax rates. Furthermore, taxes are paid on the net proceeds of the sale, after deducting sale costs and timber basis.

Reforestation costs may be recovered on your federal tax return. Private landowners who are planting trees for commercial timber production may deduct up to \$10,000 per year in such costs. Reforestation costs over \$10,000 per year are amortized (deducted over time according to a set schedule). Landowners can recover costs of either artificial or natural regeneration through this special tax treatment.

In addition, Mississippi has a reforestation tax credit for residents who establish forests on land in the state. The credit applies to costs for site preparation and reforestation. Taxpayers can use this tax credit on their state tax returns. This credit allows taxpayers to reduce 50 percent of their Mississippi taxes up to \$10,000 of the cost on approved practices in any given year. The Mississippi reforestation tax credit program has a lifetime limit of \$75,000 per taxpayer. Furthermore, a professional forester must provide a reforestation plan with your state tax return to use this state tax credit. For Mississippi taxpayers older than 65, regeneration incentive programs that were mentioned previously may be more financially attractive.

Since forestry has risks, the tax code permits forest landowners to recoup losses from natural disasters on their timber. These include storm damage and wildfire, but not insect outbreaks or disease. Losses may be deducted on your timber taxes at fair market value or the timber basis, whichever is less. The book value of the timber investment is known as the timber basis and represents direct costs to establish or own the timber. Landowners will also be liable to pay taxes on salvaged timber after a casualty loss event. It is important to document damage with photographs and document "presidentially declared disasters." In addition, landowners do have the option to purchase replacement property when faced with a casualty loss of their timber. Landowners should consult their tax advisor as to whether this will be financially advantageous given their circumstances.

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