The Traditional Timber Management Plan

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In the first half of the last century forested properties were administered under a management plan that usually emphasized timber production. These management plans had a strong foundation in forest regulation and included a cutting budget and a harvest plan. The earliest plans stressed fire prevention, sound harvesting practices, and maintenance of adequate growing stock. While a written plan was not considered mandatory for a small forest tract, most of these plans were very formal, written, and contained details well beyond what might be in a modern plan.

Many of these traditional timber management plans focused on old-growth forests that were being liquidated. Forest management was a gradual process on these tracts. Thus, the forest activities stressed in these early plans differed from those stressed today. However, timber management is always part of a forest resource management plan. In order to achieve forest management objectives (whether they be timber production, wildlife habitat improvement, recreational development, or aesthetics) it is the trees that are manipulated. The components of the traditional timber management plan are still crucial elements of the modern forest resource management plan.

Many forest owners still develop management plans that emphasize timber production. Forest industry, timber investment management organizations, real estate investment trusts, and millions of small family forest owners look at their forests as investments and expect management that produces reasonable rates of return. Many family forests are managed by consulting foresters that earn significant fees and these family forest owners usually emphasize timber production to justify the fees. The management plans on these timber production lands are similar to the early traditional timber management plans, but they also consider multiple resources and forest sustainability issues. It is not unusual to see modern forest resource management plans that are quite similar to the early format of the timber management plan, especially in the private sector and among consulting foresters.

Comprehensive Timber Management Plan Components

Timber management plans usually have three major parts: the foundation material, the plan for future management, and appendix information. Both past and present forest condition information is included, as past conditions can have

a huge impact on the future potential of the forest. Patterson (1960) outlined a complete timber management plan and the components suggested below follow his outline, but with modern detail added. Table 1 (next page) summarizes the normal components in a timber management plan.

The foundation material is the basis of recommendations for the future stand. The foundation material is factual and the future stand recommendations involve silvicultural and forest management analysis (including forest regulation and valuation). This material lays the foundation for sustained-yield forest management and provides the direction for activities. Enough flexibility is necessary in the plan to handle unforeseen circumstances. Larger forests often include the detailed information listed in the appendix in Table 1.

The arrangement of a timber management plan is not fixed and Table 1 is just a suggested format. The type of ownership and the primary forest uses will determine the best plan format. A management plan is a report, and like all reports, should be formatted to its intended audience in terms of organization, writing, and depth. A long plan often has an executive summary of some sort, a table of contents, and perhaps a glossary. Of course it requires a title page with appropriate identifying information.

Broad Components of a Timber Management Plan

Table 1 is a fairly comprehensive list of timber management plan components. These plans obviously have a timber production-orientation and thus follow a forest regeneration-forest inventory-forest harvesting-timber sale and marketing-

Table 1. Components of a traditional timber management plan.

I. Summary Information.
- A. Name, address, and contract information for forest owner.
- B. Name, address, and contact information for the plan preparer.
- C. Ownership status of forest (family, corporation, etc.).
- D. General location of the forest.
- E. General acreage and property divisions.
- F. Rotation ages, allowable cut, and harvest plans.
- G. Time period plan is relevant and suggested time for revision.

II. Foundation and Introductory Material and Background.
- A. Purpose of the plan.
- B. Management policy and objectives.
- C. Owner's expected plan priority relative to multiple resources.
- D. Specific location of forest, relation to roads, towns, markets, and boundaries.
- E. History of the forest. Former management and cutting practices.
- F. Description of the forest area.
  1. Location and boundaries (maps or other description).
  2. Topography, drainage, streams.
  3. Soils, geology, climate.
- G. Economic situation.
  1. Local communities and population (labor sources).
  2. Roads and rail transportation.
  3. Forest industry and markets.

III. Forest Description.
- A. Forest subdivisions (administrative units, blocks, compartments).
- B. Management subdivisions (stands, management units).
- C. Area by forest type and age class (natural and planted stands).
- D. Areas by site quality (site index).
- E. Present growing stock, growth, defect, and mortality.
- F. Forest protection (insects, disease, and fire).
- G. Accessibility and operability.

IV. The Management Plan (Recommended Management, Prescriptions).
- A. Management objectives in context of recommendations.
- B. Silvicultural analysis (forest biology and ecology).
- C . Regulation.
  1. Rotation age determination.
  2. Cutting cycle determination.
  3. Allowable cut determination.
  4. Cutting budget determination or harvest schedule.
- D. Markets.
  1. Timber sale policy.
  2. Logging and transportation.
  3. Timber product markets.
- E. Forest regeneration.
- F. Forest protection from insects, disease, and fire.
- G. Physical improvements needed (roads, drainage).
- H. Administration of the plan.

IV. Appendix
- A. Detailed stand and stock tables.
- B. Detailed stand descriptions.
- C. Growth, yield, and harvest data.

forest regulation format. It is possible to generalize and offer some broad categories of timber management plan components. Of course, not all plans will follow the exact format of Table 1. However, there are certain components that appear in virtually all these plans in one form or another.

The first item usually addressed is the landowner management objectives or the purposes of management. This is often not easily obtained from the forest owner, who may mention not having specific objectives (or who will make a general statement like "good forest management"). The plan will dictate levels of investment, intensity of management, kinds and amounts of forest outputs, and future forest conditions. From the smallest forest owner to the largest corporate owner or investor, these decisions cannot be left to interpretation of what is "good." Since the management objectives determine the direction, magnitude, and expected outcomes of the plan, they must be established before any work begins on plan development. Development of specific management objectives is crucial.

The economic and resource environment surrounding the forest and forest owner will have large impacts on managerial possibilities and market opportunities. What resources (capital and labor) are available to manage the forest? What are the timber markets? How do the management objectives relate to markets? The larger the forest the more important forest organization and subdivisions become. How will the forest be organized? A small forest can easily be managed using stands and compartments. But larger forests can require significant organization.

Operability and accessibility issues can become large management issues. A timber management plan obviously tends to be timber harvest-oriented. Transportation systems within the forest, harvesting terrain, and timber distribution by volume and type can dictate the levels of planning necessary. Typical timber management plans concentrate on timber, but other forest values, like recreation, wildlife, and water resources are not ignored. Accessibility can impact options for recreation, as well as other values, and should be addressed.

Any forest resource management plan, or earlier timber management plan, always has a silvicultural basis. The important analysis that takes place as part of the planning process starts as a silvicultural analysis. All aspects of timber management have a foundation in silviculture. Detailed silvicultural analysis is not expected, but the silviculture factors that control the plan need to be identified and discussed. Forest protection from insects, disease, and fire is another fundamental forestry aspect that is expected to be addressed at an appropriate level.

As part of the planning process the forest is measured. An inventory is developed and growth and yield information calculated. An inventory of some sort is mandatory. However, this inventory (which can be costly to obtain) should be performed at a level commensurate with the planning needs.

The forest inventory is sometimes confused with the planning itself. It is part of the planning process (the data collection part) and is a step in developing the management plan.

Forest regulation (a planning scheme to get the desired future forest condition and forest outputs) is always part of a timber management plan. Modern planning refers to this as harvest scheduling and the harvests can include non-timber goals. Traditional forest regulation is timber-oriented and is concerned with timber outputs. Timber management plans contain the end result of forest regulation: a cutting budget. The cutting budget will directly determine the cash flows from the forest and forest owners concerned with investment return will have a high level of interest in this result. Forest regulation usually has a goal of sustained yield (of timber) and forest continuity. Just as forest continuity is crucial, so is planning continuity. Provisions should be made to update and revise the plan as needed and on a regular basis.

Broad Philosophy of Timber Management Planning

Why is forest management planning important? Why bother to plan? First, timber is a valuable asset and, like most assets, must be managed. Management, production, and marketing must be integrated to achieve value or returns from the assets and this requires planning. Second, the planning process requires analysis and focus on resources, logistics, markets, and the path that will lead to the required forest outputs at the required times. Development of the process may outweigh the value of the plan itself. Third, forests are long-term continuing investments subject to market-induced changes in the operating environment (from timber markets to available capital or manpower). Planning helps to dampen the impacts of these changes. Fourth, planning provides evidence of stewardship. Without a management plan in hand, a forester does not appear to be taking his or her responsibilities seriously. Public agencies are expected to have plans that address the concerns of the public. Forest certification to ensure sustainability usually has a primary requirement of development of a forest management plan. Forest sustainably requires careful planning and a management plan is clear evidence of that.

A management plan is most always written. These plans can take many forms and the amount of detail contained in a plan can vary considerably. Some plans are broad-based long-term documents and even contain detailed subsidiary plans on budgets, harvest schedules, cash flows, and other activities. Others are simple statements of objectives with expected management steps.

A management plan is no better than the effort put into producing it. The quality of the technical people, data, and effort (including the planning process) obviously affect the output. Management planning is a "garbage in—garbage out" process. Or a better way to say it is quality inputs tend to produce a quality product.

Management planning costs money and takes time. The level of the management plan developed should fit the needs of the forest owner. One of the main purposes of the management plan is to address this very issue. Limited capital and limited time are reasons for planning. Scarce resources are allocated via the plan. Likewise, the level of the management plan itself should be dictated by the forest owner's needs, given his or her limited capital and time. That is why management plans can take many forms. While management planning does represent an additional cost for the forest operation, a well-developed management plan for a sustained-yield forest should easily pay for itself in increased efficiency and resource allocation.

Forest resource management planning takes place on various levels. The level of preparation should be commensurate to the need. The need is often correlated with the planning horizon; long-term, intermediate-term, or short-term. The least detailed are general management plans that address the long-term and broad management of the forest. These plans often have a planning horizon that spans several timber rotations. General management plans address management philosophy, management objectives, limitations, and overall expectations. Intermediate-level plans are more detailed and address the immediate future, perhaps one forest inventory cycle (so that they can be updated as new inventory data is available). These plans usually contain estimates of activities and the resulting human, equipment, and supply requirements (like tree seedlings). Harvest schedules, wood flows, cash flows, and mill requirements (for industrial owners) are often part of intermediate plans. The annual management plan is the most detailed. They are usually only appropriate for industrial or investment firms that need them for budgeting purposes. Companies often tie performance to annual plans (or even quarterly plans). Short-term plans are tied to operational needs in the field, like ensuring that labor, tree seedlings, and equipment are at a planting site at the same time.

Forest management planning is a continuous function. Planning does not stop once a plan is produced. A plan is an evolving document. Annual plans are prepared year-to-year and long-term plans are prepared from plan to plan; even within a planning cycle, a plan can be revised as conditions change. Throughout the planning cycle, longer-term estimates become more and more precise; as precision increases, plans can be modified to adjust to changing estimates. Planning is a continuous process, not snapshots in time.

Management plans are flexible. Circumstances change. While forest continuity is an overriding need, forestry operates in an environment that can be changed overnight by an action of nature. Forest regulation produces results that are absolute and exact. The circumstances that formed the assumptions of the forest regulation model can easily change and make optimal plans obsolete. The management plan should contain enough flexibility to allow managers to work around these types of problems.

Forest management planning is a progressive process; a plan evolves or matures. These plans have a foundation of experience. Without this foundation, the plan lacks the insights

gleamed from innumerable mistakes and false starts, or the strength that comes from strategies that have been tested over time. The continuous nature of the planning process ensures that this same foundation does not impede progress that can result from new ideas and methods.

The planning process provides for critical analysis of forest management decisions. It forces owners and managers to establish objectives and evaluate alternatives. Benchmarks are set and progress towards meeting objectives is measured. The analysis forces managers to gather data as part of the decision-making framework. Benefits, costs, and outputs can be compared; objectives can be contrasted in terms of outputs. This critical analysis gives the forest owner a much better chance of identifying his or her objectives and for obtaining future forest conditions that meet these objectives.

Forest management planning involves setting performance standards and gives the forest owner a better chance of achieving expected results. Deviations from planned results help identify problems and opportunities. Obstacles to success can be removed and strategies can be adjusted to take advantage of opportunities as they are identified.

A management plan is only useful if it is applied. The forest owner must set the plan objectives and agree to its implementation. The manager and forestry operation must agree that the management plan is the controlling document that determines the path of forest management activities over the planning horizon. Unless all the parties involved in forest management "buy off" on the plan, it is little more than a proposal. A plan must be operative (used), or it is just a document gathering dust on a shelf.

In order to ensure the management plan is applied, there should be a significant relationship between those who prepare the plan and those who implement the plan. If the end users of the plan feel their input was not solicited or ignored, then implementation of the plan is delegated to a group of reluctant people. The people on the ground implementing the plan must feel that it is their plan.

Typical Timber-Oriented Management Plan Requirements for a Southern Forestry Commission

Forestry Commissions across the country still develop forest management plans that are generally timber-oriented, but that also clearly recognize multiple-use forestry. That does not mean sustainable forest management is not being practiced (at least in some cases). As an example of the planning requirements of a typical southern forestry commission, the actual requirements from undated Mississippi Forestry Commission guidelines are below. Elements that are standard Forest Stewardship components are highlighted.

I. The management plan will consist of the following elements and will be done in the following format. All management plans will include:

A. Landowner information: name, address, land location and owner's objectives. The owner's objectives will be discussed in a short narrative form.

B. General description of the property that the management plan covers.

C. Description of each condition (stand) and recommendations for that condition. This section will include an adequate description of the timber, volume and growth data of pine and hardwood on existing stands, ***soil information to include erodability, soil compaction, and fragipan. Specific action will be addressed to deal with soil problems with each recommendation. Multiple use potential to cover such items as wildlife habitat and controlled grazing potential or protection from grazing will also be included. Other reference will be made concerning insect and disease protection***.

Recommendations will include silvicultural practices to improve forest productivity discussed in this plan. This will cover all actions to be taken during the life of the plan. All plans will cover the period of time until the next timber harvest. The plan will show estimated costs of practices, expected yields, and income resulting from improvement activities. Computer analysis will be used where available. All recommendations will be prioritized in the schedule of activities.

D. Map. The map will have each condition designated so that the landowner can related to condition and recommendation in the narrative. It will also include physical features that relate to the property. It will also include a complete legend with scale and north arrow.

E. Schedule of Activities. There will be a prioritized listing of recommended practice by dates to be accomplished. It will show specifications and ***environmental concerns*** for each practice. These certain specifications and ***environmental states such as water quality control***, planting pruning, etc. can be referred to attachments. This schedule will cover the life of the plan designating all areas of management work to be done during the period. This portion of the plan is the part of the plan the landowner should use in implementing his plan; therefore, it should be clear, concise, and easy to follow.

F. Attachments. Necessary only when referred to from other sections of the plan, but may be desirable to get specific points and practices across to the landowner.

II. All incentive cases will be covered by a management plan. Where applicable, items in the same format, as spelled out in part one of this section will be used the same as a management plan on existing stands. This will be in addition to necessary information required to accomplish the regeneration or timber stand improvement.

A. Regeneration Case
B. Release or Timber Stand Improvement Cases
C. Natural Regeneration
D. Hardwood Regeneration

Summary

The traditional timber management plan still exists and is still functional for situations where the predominate forest output is timber. Most forest resource management plans today consider all resources in the forest (multiple-use) and stress forest sustainability. The one resource that is manipulated in forest resource management plans of all types is timber. Wildlife values, recreation values, water values, and aesthetic values are all altered by manipulating the timber resources. So timber management plans are foundations of most forest management plans and the same framework used traditionally in timber management is found throughout forest resource management planning.

Detailed components of a timber management plan were presented. There is no one basic framework used by all forestry organizations. At the broadest level there is a general framework. A forest management plan should start out with the forest owner's management objectives, the forest should be described (usually stand-by- stand and with some level of forest inventory reported), recommendation for management should be made (usually overall and stand-by-stand, based on silvicultural analysis), a forest regulation framework is used to project forest outputs, and progress towards meeting objectives, especially future forest conditions, should be discussed.

Owners of small forests do not have high levels of forest outputs. Larger forests have detailed reports on forest outputs. Owners of small forests can have capital limitations that impede following plan recommendations. One schedule that is very popular with these landowners is a Schedule of Planned Activities over the planning horizon of the management plan. This should include expected costs or revenues associated with the activity. Costs in particular are much easier to cover when a plan warns the landowner on timing.

Consulting foresters, industry foresters, and foresters managing timber investments still follow the framework of the traditional timber management plan on much of the land they manage. Other lands might have plans that are multiple-use based, but timber management techniques will be a major part of those plans also. Forest resource management planning will continue to have timber management planning as its foundation.

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