Forest Management for Small Landowners

Introduction

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Background

Who Is This Written For?

Forest Management for Small Landowners is a series of chapters written for anyone who wants to learn about managing their stands for an eventual harvest, but with a focus on managing Douglas-fir within the Douglas-fir Region of western Washington. Together the chapters could be an entire book, but each chapter stands alone and can be read out of sequence. Links lead to other chapters that contain related information. The information provided is based on my 50 years of experience as a professional forester and as a private forest landowner in western Washington. My experience has been almost entirely managing Douglas-fir in Lewis County, Washington, a very small area in terms of Washington State. The specific problems, issues, vegetative competition, weather patterns, and wildlife issues may be very different just 50 miles away, but the information provided in these chapters should be appropriate through western Washington and much of it will be useful throughout the Pacific Northwest.

Who Am I?

After receiving a degree in Forest Management from Washington State University, I began working as a forester for Weyerhaeuser Company in Chehalis, Washington. For 23 years, I worked primarily on the McDonald Tree Farm, 180,000 acres in size and located in the headwaters of the Chehalis River, north to Oakville, east to I-5, and west to the crest of the coastal range crest. I was highly influenced by the intensive forest site preparation, regeneration, and growing techniques of a company trying to maximize their return on investment.

When I was in my mid-30s, my wife Donna and I purchased our first piece of forest land and within ten years owned 210 acres of Douglas-fir forest land in three parcels, which we manage under the name of B & D Tree Farm. Our personal goals are:

- To enjoy and enhance the wildlife we find there.
- To enjoy the recreational aspects of our land for us and our neighbors.
- To leave our land in a better condition than when we purchased it.
- To maximize our retirement income from our forest land ownership.

I feel I was a better than average forester and received many recognitions to reflect that. However it was not until my retirement at age 52 when I became more involved in our personal tree farm that I really began to learn about seedling management and cultivation. As a professional forester, I thought I knew the company tree farm well, but the truth was that I didn't get to each plantation every year the way I do on our own tree farm. I hadn't spent days with a backpack sprayer trying to control all those pesky weeds, and I hadn't spent thousands of hours trying to get the seedlings beyond the range of the deer browse like I have done on our own tree farm. I have learned as much from my time spent on our tree farm as I ever did as an industrial forester. I couldn't have written everything that is included in these chapters without the last 20 years of experience managing our tree farm.

Although our management has focused on bringing a financial return for our retirement, we have done many wildlife enhancement projects while waiting for our trees to become merchantable. We introduced flat-tailed beaver into a stream where they had been trapped out (*Yes, everyone told us we were crazy, but we have the perfect site that doesn't flood too much land)*, and installed numerous bird boxes and feeders which are also used by flying squirrels. From that effort, two uncommon birds - purple martin and western bluebird - are now breeding annually on the tree farm. We feel we have accomplished all of our personal tree farm goals, and while doing so have helped many other small landowners through the Washington Farm Forestry Association and the Lewis County chapter. Now it is time to share some of that knowledge with others who are just beginning their tree farm experience.

What's So Special About Owning Forest Land?

For over 20 years I was involved with the American Tree Farm System and during that time, I inspected over 100 forest properties for acceptance into the program. Originally it was a recognition program but now it has evolved into a forest certification program. The one underlying theme of each visit was the pride each landowner took in the management of their tree farm. I would jokingly tell new inspectors that they should expect the landowner to march them to every property corner of their tree farm!

On a more personal level, I feel the best description of this pride of ownership is to think of a warm summer day. I will have just finished my day's work and it is time to head home. I have a solar shower bag ready to take a quick shower and change into clean clothes. It is late afternoon or even early evening and as I am driving home, a feeling of "total contentment" comes over me. It is not the same feeling one gets from any other kind of home or property ownership or recreational activity. I often think that even if I die on the way home, everything is OK. I will have led a good life and the enjoyment of our tree farm ownership has left me in the mental state of accepting whatever happens at this point in my life!

Every Landowner's Goals are Different

I have always felt that I and other foresters should not tell landowners what to do, but rather how to do the job to get the results they want. Because of our free market system, we can log when we want to, and although there are Forest Practice Rules and Regulations, we have a lot of leeway on just how we manage our land. Each landowner can decide just what kind of forest they want to manage.

- Do you want to manage intensively, or plant the ground and turn your back on it?
- Are your goals primarily for the financial return, or for recreational, aesthetic, or wildlife aspects of the land?
- Do you want to harvest your timber at age 40 or grow it for 100 years? There will be some financial downfalls if you do manage to 100 years of age, but it is your choice.
- Do you want to plant and raise 300 trees per acre (*TPA*), or 400 or 500?

As mentioned above, my bias is towards intensive management for the greatest financial return, but not without considering the recreational and wildlife benefits of our forests. In an effort to help you do what you want, I have tried my best to provide information that goes beyond my personal bias of what you should do. What is presented here is highly influenced by my opinions, yet you should still find enough other ideas to pursue them further through other sources. I hope you see my advice as broad enough to help you do what you want to do!

You will enjoy the management of your forest land more than any other thing you do in life. You may not believe me now, but once you get into it you will be telling your friends how much you enjoy it and what it means to you!

Change is Constant

As a young forester, I was pretty cocky about my knowledge and felt that if a landowner told me what kind of product they wanted for a final harvest, I could write a prescription for how many trees to plant and how to manage it to get the desired result. Then along came planting density studies and more knowledge about ramicorn branching (*high angle branching*), sinuosity (*wavy nature of a tree terminal and trunk*), and far red light. All of a sudden I found that like a lot of foresters before me, I didn't know it all and should always be open to new and revolutionary ideas.

Now as I am closing in on 50 years in the forestry profession, major changes to the forest products field are on the horizon. New foresters won't think twice about these new products and improvements, but someone looking back sees a continuous cycle of changes and improvements. In my career, I focused on growing trees for what has traditionally been the highest value – lumber. As time passes, new uses for the chemical components of wood may change the emphasis on producing trees of lumber quality. Researchers at the USDA Forest Service Forest Product Laboratory and several universities are working to develop new products using the chemicals and fibers in wood.

Cellulose Nano Materials (CNs)

CNs are among the most abundant organic substances on earth and new uses for them are being developed.

- **Concrete Additive**: When CNs are added to concrete in small amounts (*0.2 percent by weight*) it can improve the flexural strength by amounts of 20-30%.
    - Being able to use less concrete and still get increased strength is of interest to highway engineers.
    - Also, less carbon dioxide is emitted during the cement production phase.
- **Paper Packaging**: Paper food packaging with a CNs coating serves as a barrier to oxygen and is impenetrable to oils.

- **Nanocellulose** is being used in the medical field for:
  - Repairing heart defects;
  - Constructive contact lenses and protective barriers;
  - Improving skin regeneration;
  - Wound healing as a scaffold for cell growth;
  - As a material for advanced dressing coupled with drug deliveries.
- **Electronics**: CNs have been used to produce flexible transparent films that serve as a platform for electronic circuits. The nanocellulose films are strong, flexible and less prone to thermal expansion than current electronic circuits. The polymers of the CNs products also do not heat up like what is used today.
- **Personal Care Products**: When cellulose products are highly refined, they can be added to hand creams, sunscreen, cosmetics, and other personal care products. The end product is very smooth, stays on the skin longer, and is less expensive to produce.

Lignin Based Polymeric Resins

Lignin comprises up to 30% of a tree's biomass. In the traditional paper-making process, the wood cellulose is used and the lignin is a waste with very little value. Lignin is now being evaluated as an inexpensive, lightweight, replacement for petroleum-based products rigid foam insulation panels. The product is:

- About ½ the cost of petroleum based products;
- More fire resistant than the petroleum-based products. It has been estimated that even a couple of minutes saved in a major house fire would save more lives.

Douglas-fir Region

The area in western Washington between the ocean and the mid-slopes of the Cascade Mountains is generally referred to as the Douglas-fir region. When the first settlers arrived in the 1800s, they found millions of acres of uninterrupted Douglas-fir forests.

Douglas-fir is named after David Douglas, a Scottish botanist, thus "Douglas" is capitalized.

The fires that caused these stands were predominately natural fires but the native Indians did light repeated fires to maintain desired habitat. The stands the settlers found ran from seedlings to over 500 years old. The oldest trees on the best soils were 6-12 feet in diameter and over 200 feet in height.

One large fire ran from Toledo on the south to Fort Lewis on the north, and all the way to the Cascade Range. The result of that fire was a Douglas-fir forest that was too small (young) to be considered by the early loggers but was just perfect for railroad tie cutting at the beginning of the 1900s. The area around Morton, Washington, became known as the "Tie Capital of the World" in the early 1930s because all the timber was 3 to 4 feet in diameter and not the 6 to 12 foot diameters that the earlier loggers wanted. Families worked together to cut the trees and haul them to small sawmills that were scattered through the region. After the logs were cut into railroad ties, they were hauled by wagon to huge loading docks along the railroads tracks.

Just because Douglas-fir dominated the west side of Washington historically is no reason why we have to plant it today. However when you look at the products that are made from Douglas-fir, its strength over all other native species, and its high market values, one realizes why western Washington is still Douglas-fir country and why so many people plant it for another crop.

Other Forest Types Within the Douglas-fir Region

Within the Douglas-fir region are small areas of other forest types. These have been created by lack of fire, repeated fires, and glacial activity.

- Fog belt: In a narrow strip along the ocean (*roughly 10 miles wide)*, a mixed stand of hemlock, spruce, true fir, western redcedar, and Douglas-fir grows. Prior to white man's arrival in the early 1800s, the stands were what we call a climax forest, a stand that evolves into one that can perpetually stay the same species composition. This climax forest was possible because of the amount of rainfall and lack of fires. The species that regenerate under a climax forest are mostly shade tolerant (*can grow under various levels of shade)*. Occasionally fire or wind would create openings that allowed shade intolerant species like Douglas-fir to establish a foothold.

- Cascade Range: The Cascade Mountains separate the wetter Douglas-fir habitat from the drier eastside forests of ponderosa pine, western larch and other species. On the upper flanks of the mountains with increased rainfall and higher elevations, a forest of true firs, western redcedar, and Douglas-fir became established. It was similar in many ways to the fog belt but with a totally different type of soils.
- Prairie: Scattered throughout the Douglas-fir region are small areas of prairie where totally different tree species flourish. Lodgepole pine, ponderosa pine, and Oregon white oak are found in the prairies, but in few other places in western Washington.
    - The retreating ice of the last glacial age left some areas covered with sand, gravel, rock, and very little topsoil. These sites are extremely well drained, (*water drains quickly to a depth greater than the tree roots*) and because of the lack of topsoil, they are of low fertility (*low site*).
    - Native Americans used fire to create or maintain prairies to enhance growth of food plants. They harvested the bulbs of camas flowers in the lowland prairies and blueberries on the slopes of Mt. Adams.