

# Northwest Woodlands

A Publication of the Oregon Small Woodlands, Washington Farm Forestry, Idaho Forest Owners & Montana Forest Owners Associations

## VALUABLE LESSONS FOR FORESTLAND OWNERS

**Know the Basics of Your Forest**

**Work with the Best Contractors**

**Strive for Forest Resilience**

**Contracts for Woodland Owners**

**Technology Can Help**



### NEXT ISSUE . . . Integrated Pest Management

This magazine is a benefit of membership in your family forestry association. Contact the officers listed on page 5 for membership details.

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*Consistent sharing among forest-land owners and managers makes the community stronger, represented here by Ron Munro teaching about stand management at Crystal Lake Tree Farm in June 2017. Ron encouraged stewardship and commitment toward sustainable forest management by sharing his knowledge and experience for many years. Photo courtesy: Patti Playfair*

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## PRESIDENT'S MESSAGE



RICK BARNES



# Timing is Critical—but Remember to Stop and Smell the Roses

**A**s a forestry consultant and small woodland owner, there are always things to learn and more projects than I have time to do. As we go from season to season, I am always on a tight timeline and pressed to get the next task completed. Let's look at my annual tree farm project schedule.

**Fall.** Site preparation is very important prior to planting season. There is a limited window of time when you can use chemicals to successfully control unwanted noxious weeds without damaging your crop trees.

**Fall/Winter.** It can be challenging to find an opportunity to burn slash piles when the fuels are wet enough to safely burn, dry enough to meet the burning objectives and you're able to get smoke clearance.

**Winter.** Planting season! It's time to start that new crop of trees. Also, check roads and culverts after storms. Timely correction of problems, such as blocked culverts or ditches, can minimize negative environmental impacts and road damage, and will be much less expensive to fix.

**Spring:** Spring is the time to do vegetation control for grass and brush competing with your young seedlings. This is a critical step I learned the hard way. One year I did the site prep and planted seedlings, but when spring came along I was busy working on another property and didn't get the grass control done. I knew better and faced the consequence of substantial mortality. I interplanted the site the next winter and followed up with

another treatment of grass control. I have not repeated that error.

**Summer.** Timing for noxious weed control is dependent on the target species. If you miss a season or two the problem can increase exponentially. This is also the time for road maintenance, such as clearing ditches and culverts, which should be done in dry conditions. Make sure your roads are open for access in case of fire. Late

summer or early fall is the time to check roads to make sure they are set up to withstand winter storms.

The above is a list of my annual chores, but it doesn't include any stand management activities, such as harvesting or precommercial thinning. These also have time frames that must be worked in with the annual projects.

I thoroughly understand the importance of completing projects while the time is right and, quite frankly, I have always been driven by that concept. That being said, as I struggle each season to find time to complete my projects, I am exhausted and find myself often forgoing a day off and missing family activities. It's becoming clearer to me each year how important it is to take a day off now and then and enjoy life. There are so many things to enjoy and be thankful for on your tree farm. Take time to appreciate your many blessings—stop and smell the roses. ■

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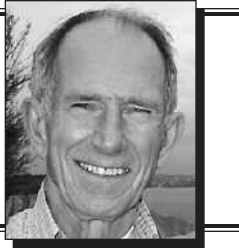
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## PRESIDENT'S MESSAGE



MIKE CHRISTIANSON



# Valuable Lessons for Forestland Owners

**O**ur lives are too short to learn all the important landowner lessons the hard way—the school of hard knocks. Fortunately, one may learn from others who endured the pain of learning the hard way. Here are a few of those lessons for forestland owners.

1. Forests change continually, not just every 20 or more years that it takes for a tree to mature. Well-maintained forests need weed maintenance and frequent (yearly or so) removal of fallen, diseased or other unhealthy trees to prevent spread of diseases or fuel buildup.

2. Forest ownership gives rise to duties. There is a moral duty to practice forest management for the sake of your forest and the surrounding properties. A legal duty may also exist

such as managing noxious weeds, preventing an attractive nuisance or otherwise maintaining property in such a way that it is not a risk to the safety of others.

3. Access to your property cannot be taken for granted. The mere fact that a neighbor allows you to cross his or her property to get to yours is no guarantee that this will continue. Recorded easements are the most reliable means to assure access.

4. Access over your private land may also be gained by others through easements granted by prior owners. Also, third parties may become entitled to a prescriptive easement over your property if they have traveled through it for a period of time (five years in Montana).

5. You may not own what is

beneath your feet. Prior owners may have sold the mineral rights under your property. Check for recorded transfer(s) of mineral rights.

6. That beautiful water flowing through your creek, stream or river may be owned by others. You may have no right to use the water, depending on the water right in public records. In Montana, most waterways are available to the public.

7. Do not assume you will find water when you drill a well, even if a water witcher, or dowser, located the spot to drill. Also, consider that wells can run dry, so it is wise to have expert advice on well productivity, in terms of gallons per minute or other measure.

8. Not all forest owners think alike. Your neighbor may not care about noxious weeds, fuel reduction or silviculture. In fact, your neighbor may resent your forest management practices.

9. Loans must be paid. Remember this if you are considering securing a mortgage, lest you lose your forest one day.

10. Adding any structure to your forest property may result in increased property taxes. In some states, forestland owners enjoy significantly reduced tax rates. Adding a structure may change the tax nature of some of the land. If you are concerned, check with your department of revenue or property tax assessor before beginning construction.

Phew! This is the list of some of the lessons learned by me, either through hard knocks or passed on by others. ■

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## PRESIDENT'S MESSAGE

Washington

PATTI PLAYFAIR



# A Poignant Lesson for Associations: the Importance of Succession Planning

If you have belonged to your state's forest owners' association for very long, you've heard of succession planning for your forest. The concept is simple enough: each generation of family forest owners brings the next generation into management of the forest to improve the probability that long-term ownership goals are met. Although the concept is simple, the execution can be tricky even with careful planning, open communication and clear goals. Family dynamics can derail even the most prepared families.

Similarly, family forestland owner associations benefit from a little succession planning by finding and nurturing future leaders for the organization. In some ways, this can be easier than family succession planning. There probably won't be the messy family dynamics of, "Who gets Grandma's yellow plate?" to quote Clint Bentz. But in other ways it can be much harder. Most members are happy to let someone else take care of business, so getting them involved takes some work.

Here's a little story of getting it right. In 1980, WFFA member Ron Munro and his wife, Miriam, built a home at picturesque Crystal Lake, which is a homeowner community with the lake at its center. However, Ron soon discovered the community also owned 200 acres of forestland. Ron, an avid steward of the land, was

soon teaching his neighbors the tenets of good forestry and active management. The Crystal Lake community has embraced sustainable forestry, leading them to sheer excellence; in 2001, the Crystal Lake Tree Farm (CLTF) earned the Washington State Tree Farmer of the Year award.

Recently, the entire WFFA family was invited to visit CLTF to see one of the most remarkable succession plans in action. In June 2017, the tour of CLTF introduced visitors to the forest council that handles the ongoing forest management of CLTF. This very smart idea has become the foundation of the succession plan for the community's forest.

Sadly, very shortly after the CLTF tour, Ron Munro passed away; but, his succession plan was already in place and he nurtured his successors well. They are ready to continue the forest stewardship and succession plans that Ron taught, even though he is no longer with them.

Ron's example of good stewardship is obviously an excellent basis, which can be duplicated for your succession planning. It not only worked for Crystal Lake Tree Farm, but inspires us all to seek out the next leaders of our organizations and nurture their evolution, just as Ron did for family forest owners far and wide. ■

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## PRESIDENT'S MESSAGE



SANDRA MURDOCK



# The Top Six Lessons

**S**ix lessons that are key to private forestland ownership:

1. Join, learn from, and stay members of your state forestland owners' association. The people who run these organizations are forestland owners like you. We are all learning, applying and sharing knowledge. We are also great groups to get to know and find friends within. Please remember, we are volunteers; we are working hard to give you knowledge and events, and to provide representation to you and other land owners. Please continue your membership and

support to these non-profit, non-government, local organizations.

2. You can get lots of help and training from your local university Extension office. The University of Idaho Extension has a Master Forest Steward program and classes that are a wealth of knowledge and comradeship.

3. Your state department of lands (in my case Idaho Department of Lands) is also key to your success. Make sure you know who and where they are. You can get their help with your forest plan, and you will need

their services if you do a harvest. They will help you understand the laws for fire hazard reduction and stream protection that apply to you.

4. Weeds need to be managed! After you learn about all the noxious weeds, and why they are noxious, it's more stressful to walk your property. This is because you now know that the enemy is there and you can't just walk. Learn and plan the strategies to get rid of them. Ignorance is bliss, but it isn't good for the native plants, and the weeds are much easier to eradicate if you catch them in the act of their first attack.

5. There is no such thing as a shade-loving tree! Read that again, and learn why this matters to you and your overall forest health and diversity. If you leave your forest to "be natural" then the fast-growing and shade-tolerant trees will take over, and they are also susceptible to bark beetles and root rot. You need at least one of the following management plans: harvest, thin and prune, or let it burn. Which one are you working on?

6. Tree farms need to comply with the new shade rules, but animal farms and agriculture farms don't. What? That's not fair! But, yep, for now it's true. Do you know why? It has something to do with pre-existing stream conditions, but it has more to do with big representation in agriculture. Make sure you support your state forest owners' association. We are working hard to pay attention and be represented. If not, your rights might be taken away. ■



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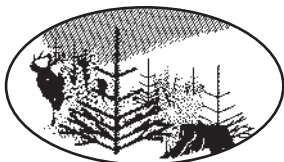
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# Down on the Tree Farm

## NOVEMBER

- ✓ Winterize and complete maintenance on your equipment. Clean off mud that can “freeze” moving parts, drain fire hoses and pumps, sharpen your hand tools and store them in a dry place, and check your antifreeze levels. Good tool maintenance pays off!
- ✓ Check your culverts and evaluate your road drainage. Good ditches, waterbars and culverts can prevent washouts, costly repairs and degradation of water quality. Better water quality and habitat mean better fishing!
- ✓ Pruning can reduce fuels, repair storm damage and improve aesthetics, visibility and log quality. Be sure to leave enough live crown to support the tree’s photosynthesis and cut just outside the branch collar to encourage “healing” of the cut.
- ✓ Consult with your accountant to plan your year-end tax moves.
- ✓ Assess wildfire damage to your forestland and make plans for restoration if necessary.
- ✓ Seed bare ground with native grasses to control erosion and invasive species.
- ✓ Burn your slash piles when conditions allow a clean burn with no unintended spreading or smoke intrusion.

## DECEMBER

- ✓ Donate or sell your holiday greens, boughs, mistletoe, cones and trees.
- ✓ Hold a family meeting to review accomplishments and reaffirm your tree farm goals and objectives. Inspect your forest with family and friends. Take a family photo on the property. Watch for evidence of wildlife to encourage your heirs to continue the tradition of good forest management.
- ✓ Refresh your property boundaries and signage.
- ✓ Renew your association membership and plan to attend or organize meetings, tours and classes.
- ✓ Check into membership and certification in the American Tree Farm System.
- ✓ Complete your record-keeping for 2017 and your financial planning for the future.

## JANUARY

- ✓ Plan your 2018 projects, contact consultants, hire contractors and file for necessary permits.
- ✓ If the ground freezes, it could be good timing for your logging operation to reduce soil compaction and risk of fire.
- ✓ Your management plan is a dynamic document. Spend some time updating and refining it with input from your family’s future forest managers.
- ✓ Tree planting can begin in January if snow or frozen soil aren’t present. Pay attention to soil moisture and temperature; seedling source (zone and elevation), quality and species; and proper handling/planting techniques. You’ll be glad you did it right the first time!
- ✓ If your forest is accessible, this is a good time for cruising, road layout, marking property boundaries and establishing continuous inventory plots and photo points so you can see the effect of your hard work over time.
- ✓ Watch for nesting activity so you can protect or improve the habitat, and avoid disturbing the wildlife while they are sensitive.
- ✓ Update yourself with the latest forest and grassland science by reading the bi-monthly “Science You Can Use” bulletin online.

## FOR MORE INFORMATION...

check out these favorite websites and publications:

- [forestsandfish.com/environmental-protection/road-improvement](http://forestsandfish.com/environmental-protection/road-improvement)
- [cru.cahe.wsu.edu/CEPublications/eb1984/EB1984.pdf](http://cru.cahe.wsu.edu/CEPublications/eb1984/EB1984.pdf) (conifer pruning)
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*Down on the Tree Farm is a compilation of all of the excellent tips contributed to this column by experienced volunteers over the last 15 years. Suggestions are always welcome and may be sent to the editor at: [annewithnww@gmail.com](mailto:annewithnww@gmail.com).*

# Know What You Have, How It's Growing and What It's Worth

By **PETER KOLB AND ANDY PERLEBERG**

**Y**ou just bought some forested land or have owned some for years but never had the time to do anything with it and you're not sure you should; where do you start and what do you do? Many forestland owners face this challenge and can be perplexed by all they have heard and read about deforestation, wildfire risk, wildlife habitat, weeds and bad things people have done to nature to make a profit. We like nature, things made from wood, conservation and, in some moment of weakness, will also admit that we like money—or at least what it can buy. Thus, regarding our forest-



*Peter Kolb*



*Andy Perleberg*

ed land, how do we come to terms with doing the right thing, not going broke doing it and perhaps making some money in the process?

In most situations, conservation does require a monetary and labor investment. Over the past 30 years, various educational venues have helped many landowners develop conservation plans for their forests, yet having a plan and implementing it can have some real hang-ups. Revisits with landowners often reveal changes or delays for various forest plans, which most often are due to monetary, labor or information shortfalls. Not too surprising, private landowners find themselves facing the same problems that federal agencies often do: plans based on ideals, without being aware of the financial realities for the specific location, can be overly expensive in time and money to implement. In addition, forests change, sometimes very quickly, which might need a change in plan objectives. All forestland owners must deal with costs and alternative forest sce-

narios that include insect outbreaks, wildfires, weather phenomenon, exotic species, wildlife and new information or knowledge. There are several basic steps anyone who owns forestland might consider to help them meet the needs of their forest and ownership objectives.

## **Know what trees you have, how they grow and their age**

Forests are dynamic and made of thousands of organisms, many that you can't even see. However, the main drivers of a forest are the trees, and each species has its own needs and quirks. There is the philosophy held by some that each forest is a carefully organized harmony of species that live in balance with each other. There is the other philosophy that it is a jumble of species thrown together by the happenstance of history and luck: some will live and some will die in the cruel struggle called nature. The more you know about your forest species and the natural history of your specific forest, the more you can distinguish between examples on your land of



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PHOTO COURTESY: PETER F. KOLB

*A typical wild forest with a mix of species, ages and conditions. As more trees die from stress, cost-effective and ecologically appropriate management options decrease.*

each philosophy, because examples of both typically exist on every forested parcel.

Trees all need light, water, nutrients, space and the right climate to grow bigger. When any of those critical needs are not met, trees get weak, which makes them susceptible to pests, pathogens and environmental stressors associated with weather and climate. Each site may have tree species that play distinct roles during the natural cycle that affects all forests. During early stages of development, pioneer species may be essential to mitigate too much sun and heat that excludes other species. In the later stages of a forest cycle, the more shade-tolerant species might be better suited to deal with overcrowding and too much shade. How these species interact and transition is part of a site's ecology, and in many situations a continuing focus of research. For example, ponderosa pine provides a shaded microsite for Douglas-fir seedlings that then develop the ability to steal essential soil water away from the pines, ultimately killing them and allowing the fir to dominate the site. However, the best-laid plans don't

always work because Douglas-fir is less resilient to wildfire and has more valuable wood, so either nature or humans remove the Douglas-fir and leave the pine. Some species try to outlive the competition by simply having deep roots, extreme fire resilience and taller growth, such as western larch; or by growing in dense, shaded stands that keep all other species from becoming established, such as western redcedar. In Montana, larch and cedar are growing in groves estimated to be over 1,000 years old. Alternatively, it might be hard to find grand fir older than 300 years. Even though their shade tolerance should allow them to live a lot longer, they have not evolved adequate defenses against many diseases and insects. Foresters refer to the genetic and growth characteristics

–Continued on next page–



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of tree species, the soil productivity and the environmental influences as the “site suitability.” This is a key concept for understanding how stands develop and change, and what you can do to influence your forest’s health and productivity.

Old trees (greater than 300 years of age for this example) are a sign that those specific trees had what it takes to survive on that site under the conditions of the last 300 years. However, it does not necessarily mean that those trees will survive the next 100 years. It depends on the species, the site and the risks to individual species on that site. To assess the risks to your forest, as well as the potential, it is important to have a good understanding of what tree species you have, how many there are, how dense, how distributed across the landscape and how well they are represented in each age grouping. For example, a property with only trees more than 300 years-old can be considered old-growth and have the characteristics many people cherish: cathedral canopies, specific wildlife and understory plants, large diameter trees and the sense of grandeur that comes with living things that last longer than we do. If your property is the only one that has



PHOTO COURTESY: PETER F. KOLB

*A forest harvested at cost to remove dead and afflicted trees and reduce wildfire risk. Proactive management prior to the beetle outbreak, and finding the right markets or cost-share, would have allowed for a wider range of alternative treatments.*

these trees it may be a rare and important part of the surrounding ecosystem. Alternatively, if your property is part of a large landscape where all the trees are the same age and species, it might be akin to living in a city where nobody is younger than 60 years of age: it is at risk of losing its diversity and viability. Such an assess-

ment can only be made by first knowing what trees, species and age classes grow on your land. Taking a walk in the woods with a professional forester can help you assess your forest tree composition. Your state service foresters have the knowledge and tools, and will typically be happy to pay you a site visit without fee.

### Assess the condition of your trees

The leaves (needles) on the tree are the energy production system. If the tree has a good crown and access to enough water and nutrients, growth and survival will be enhanced. Often the percentage of live crown a tree has reflects its condition: one-third to one-half of the overall tree height with live crown indicates a healthy tree. The amount of live crown can be misleading, however, when the tree is within an actively growing forest where trees are still getting taller. In such situations, a forest can grow itself into an intensely competitive situation where trees have good crowns, but competition for soil resources, such as water, has suddenly created a deficit of this precious resource; the group of trees in this situation runs out of water



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early in the summer. Sudden water shortages create a scenario where produced sugars cannot be transported to the rest of the tree and accumulate in the upper tree stem.

Most insect pests, and even stem fungal diseases, feed on a tree's sugar, not the wood. A drought-stressed tree is the ideal food source: an easy source of sugar that cannot defend itself because the main defense, pitch, cannot move to the site of attacks due to lack of water pressure in the stem. Examining a tree's past growth by measuring the thickness of the last 10 years of stem growth near DBH (diameter at breast height, which is 4.5 feet from the soil surface on the uphill side of the tree) will indicate if the tree has suddenly experienced increasing water stress by exhibiting fairly rapid reductions in annual ring growth. Most landowners (and foresters) prefer to use an increment borer to extract a core of the tree's recent years of growth versus cutting a tree down to count rings on a stump! Trees with quality crowns but rapidly diminishing annual ring growth are at a real risk of being attacked by pests and pathogens. Trees with reduced growth and poor crown ratios (less than 30 percent) also indicate stress, but produce less sugar and thus are not quite as attractive to pests as recently stressed fast-growing trees. There is also a point where trees have grown too old or too dense to respond well to a reduction in surrounding tree density. Height growth in very old trees is limited by their ability to transport water to their crowns. When their crown has been reduced by shading from competing trees, thinning may decrease water stress but also allow for greater wind to affect the tree, causing wind-breakage or increased water loss. Similarly, younger trees growing for too long in an overly dense stand have developed such small crowns and associated root systems that thinning must be conducted very slowly over time or they will break off, blow over or die from sunscald when thinned to an optimal

spacing all at once; foresters refer to this condition as "thinning shock."

### Know your markets for forest products

Treating a forested area to relieve water stress, competition for light, and reduction of fire hazard typically generates a lot of woody debris. If trees are thinned and the woody debris is left on the site you can create a breed-

ing ground for various bark beetles and a high-fuel condition for a wildfire. And scattered slash can just make things difficult for getting around, both for some wildlife species and for you! It is generally recommended that this material be treated by chipping, burning or removal. Across the West, such work can easily amount to costs

—Continued on next page—



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of over \$2000 per acre treated. Alternatively, if you can find a good market for this material, it may pay for removal and treatment of excess woody debris, and even generate a modest income. Every mill can have unique needs for its products and thus tree species, diameters, lengths and stem straightness will determine if your thinned material has any value and how much. It is important to also factor in how much material your forested property will generate. A post and pole operation may be fine with an acre's-worth of raw material, while a logger looking for saw logs typically needs a minimum of five acres of material to make moving equipment cost-effective. The more material you have, the better the economics of harvesting get; at some volume, the logger will not only cover their costs, but also generate a profit that can result in income for you. Finding markets takes some work on your part and some patience. Depending on the current economic situation, there may be high or low demand for certain wood products and thus certain tree species and tree sizes. A post and pole yard may have just signed a harvesting contract with a larger-acreage landowner and have enough supply for six months,

but may be looking for more at a later date.

Firewood can be produced from many tree species and tree sizes and is another potential outlet for a forest treatment. Markets for smaller materials, such as branches and tree tops, remain elusive because it is labor-intensive to handle and treat versus the volume of material generated, though in some areas biomass, compost and mulch markets exist for this material. Knowing what your markets are before you write your forest management plan allows you to develop a more realistic scenario of what you can afford to harvest, versus what you want to harvest. It can also help you come up with a realistic timeline of when you can harvest.

#### **Develop a realistic management plan for your forest**

All too often, a management plan is written with a consultant, in a workshop or on your own that reflects what you want to do on your property without being certain how you are going to carry out those goals. Although this is a perfect start, what we want and what we do are usually tempered by what we can afford, and the added experience and knowledge we gain as we work on projects.

Sometimes there is cost-share available through county, state or federal agencies; often there is not, and the best written plans are non-functional because the costs, revenue and enormity of the work are not practical or affordable. In this situation, a landowner might need to wait and hope for log prices to improve. If the forest is in an overcrowded and stressed situation, some pest or pathogen might hit the forest with catastrophic results before the work can be done. Another problem can arise when the value of the timber is just enough to cover the costs, and most of the best trees to leave are also the ones that generate the income needed to complete the rest of the work. Compromises that you can live with, might need to be made in those situations and it is wise to develop plans with the perspectives of perfect, doable and not doable. If you have done your homework, your markets are cooperative, you have the resources and some luck, the perfect plan can be achieved. If circumstances do not line up, then the doable plan might suffice.

No plan is complete without understanding the protection and enhancement practices needed to achieve your goals, and a logical schedule for getting the work done is very valuable. It is important to keep looking for and monitoring existing and emerging markets, financial assistance opportunities and pending risks, such as insect infestations and wild-fire. Forest management is a long-term commitment and, like raising children, we are often wisest after we have completed the job, not before.

#### **Get help!**

Consulting foresters can help landowners because most have multiple clients and can pool the harvestable resources across multiple properties to leverage better prices and, therefore, more economical options for a landowner. In other words, they have studied all the economics, developed relationships and

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*A private forest proactively treated at cost to enhance elk winter range, reduce wildfire and insect risk, grow bigger trees and provide increased recreational opportunities.*

proven their value to the wood products industry resulting in some negotiating influence—all on your behalf as they work as YOUR employee. Vet your consulting forester carefully: ask them for references and ask other landowners for input. Not everyone will be able to meet your needs and expectations. Some consultants specialize in specific markets and others work with contractors that may or may not have the equipment that works for your situation. Also, do not be afraid to work with mill foresters. They may not have the diversity of markets available to them that a consultant has, but if you have the right resources in your forest that their mill requires, they can also meet your needs. Remember, it is your forest and you have the ultimate say in what happens there. Developing good working relationships with foresters—agency, consulting and industry—will benefit you because they can help you assess what you have in your forest, then offer their experience and opinions of how to meet your objectives.

A final note on government landowner-assistance foresters: these foresters are employed by local, state or federal agencies and can provide

landowners with basic management advice. They often can help landowners gain access to financial assistance for completing land stewardship activities that protect and enhance resources deemed valuable and beneficial to the landowner and society. Reducing wildfire risk by thinning non-commercial-sized trees is a good example of a practice that really makes a difference should a wildfire occur. Financial assistance creates public benefits, such as enhanced wildlife habitat, wildfire risk mitigation, protection of streams and soils, and even aesthetic beauty that private forests provide. A walk in the woods with a stewardship forester is generally the best first step to understanding your forestland and getting answers to your specific questions. However, agency foresters cannot give the level of attention that most landowners need to plan and administer a timber sale, large-scale reforestation project or other treatment. Some practices, such as installing a culvert or other fish passage structure, or building bridges, may need a combination of biologists, engineers and hydrologists. A visit with your state service forester or Extension forester can usually save

you time and get you connected with right resources for carrying out your management needs.

### **Support your wood markets**

Without buyers for what your forest grows, you will have a harder time being able to afford to meet your goals. Working with the wood products industry should be a mutualistic relationship, as landowners offer the raw materials and the various businesses provide the revenue to work with your forest. Just as forestland owners have long range plans for their forests, wood products manufacturers need a long term sustainable supply to invest in their infrastructure. ■

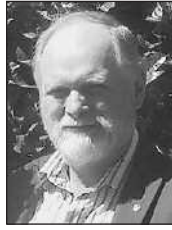
**PETER F. KOLB** is the Montana State University Extension forestry specialist and associate professor of forest ecology and management. He has worked in both applied forestry and research across the northern Rockies and western plains for over 30 years, and was a Fulbright scholar to Bavaria, Germany. Peter and his family live on their 20-acre tree farm north of Missoula, Montana. Peter can be reached at [peter.kolb@umontana.edu](mailto:peter.kolb@umontana.edu).

**ANDY PERLEBERG** is Extension forester and associate professor for Washington State University. He provides organized educational opportunities to forest owners and natural resource professionals. Prior to his current position, Andy worked in industry and government research and development by painting trees, cruising timber, fighting fire and even counting fish. Somewhere in the middle of everything, his wife dragged him, kicking and scratching, into the Peace Corps, where he worked in agroforestry. It was in the Ecuadorian jungle where Andy learned what helps him wake up in the morning and go to sleep at night: helping others understand why forests are important. He enjoys nature walks, bedtime stories, bonfires and baseball. Andy can be reached at 509-667-6540 or [Andyp@wsu.edu](mailto:Andyp@wsu.edu).

# Choosing Contractors Who Can Help

By **DICK HOPKINS**

**F**orestland owners may only need contractors and consultants (contractors) once in their lifetime. That one point in your life may involve dealing with several contractors in a short span of time: a consultant to appraise your timber, a consultant to write your forest practice application, a contractor to manage a harvest (could be the logger), a contractor to do the reforestation and a consultant to update your forest management plan. Sometimes other contractors are needed: land surveyors, attorneys and tax accountants. These are examples of contractors you might work with. In forest ecology, it is called symbiosis. When choosing a contractor to work with, what might you consider?



## Experience

How much experience does the contractor have writing forest management plans, forest practice applica-

tions, SEPA (State Environmental Policy Act) checklists and alternate plans? Forestland owners often have fish streams, channel migration zones or an eagle's nest on their property. How much experience does the contractor have in writing the required applications and technical reports?

Can your potential contractor appraise your timber to give you a value, and back out costs of logging, hauling, administration and taxes to give you a bottom line? Can your contractor design a new road with a fish-friendly bridge? How much experience does the contractor have in harvest layout relative to the stream buffer allowances for small forestland owners? How much experience does the contractor have for selecting the right logging equipment and operational plan for the landscape? Will the falling lead keep the tops on your property or not? How does your contractor propose dealing with laminated root rot? Does your contractor know how to determine if you should precommercial thin at age 15 or commercial thin at age 25? How much experience does the contractor have in

site preparation following harvest? How many seedlings has the contractor personally planted in his/her lifetime?


Can your contractor keep track of loads of logs? Does your contractor use trip ticket books? What is the best log sort and what is the dollar difference by sort and destination for a 3-saw Douglas-fir log? Can your contractor present you with a spreadsheet showing where every load was delivered, tare weight of each truck for weighed wood and your costs and profit for the operation? Experience is earned, but not quickly.

## Contacts

If your contractor does not have direct experience, does he/she have the contacts to get answers and action? How many log buyers, loggers, reforestation contractors and herbicide contractors can your contractor call? If there is a Category I wetland, or a fish passage issue, or a funny-looking nest on your property, does your contractor know who to call to get help? One complex issue is converting forestland to non-forestland and working with the county representatives (not a recommended experience); who is the person to visit? Talk can be cheap, but answers and actions can be profitable.

## Commitment

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accountant or attorney, must be committed to your natural resources and you. A contractor should help you manage the biological resources, while providing economic and legal protection to you through best management practices, experience and use of valuable contacts. When the regulations seem unworkable, the weather won't cooperate or an individual won't budge on a detail, will your contractor find a solution through commitment?

Experience, contacts and commitment are essential qualities of your contractor. What about dollars? The adage "you get what you pay for" is true in contracting and, unfortunately, money talks. I have appraised a property and laid out a management plan for a client, only to find that my advice was second to the large cash offer from another contractor for the timber. No matter what he could have received on several operations by following the plan, the landowner could not resist the immediate cash offer. Now he has a stump farm and I'm watching to see if reforestation will occur.

Remember you need to work with your contractor. The right contractor will teach you and give you experience as you work together on your forestland project. You will gain some interesting contacts, and your commitment to your tree farm will be enhanced. ■

**DICK HOPKINS** is a partner at Hopkins Forestry and a member of Washington Farm Forestry Association. He earned an M.B.A. in engineering and technology management after receiving his B.S.

*forest management. Dick's background includes: wildfire suppression and slash burning; research on climatology, water yield and laminated root rot; work in sawmills as operations forester and log yard manager; operation of three forestry consulting and contracting companies; forestry educator at Green River Community College, Lincoln Tree Farm and Hancock Forest Management. He is a Society of American Foresters certified forester,*

*Fellow and recipient of SAF's Carl Alwin Schenk Award in 2005 and Washington State Forester of the Year in 2008. He was also awarded the University of Washington College of Forest Resources Alumni Association's Distinguished Achievement Award and the Green River Community College Distinguished Faculty Award. Dick can be reached at hopkinsforestry@yahoo.com.*

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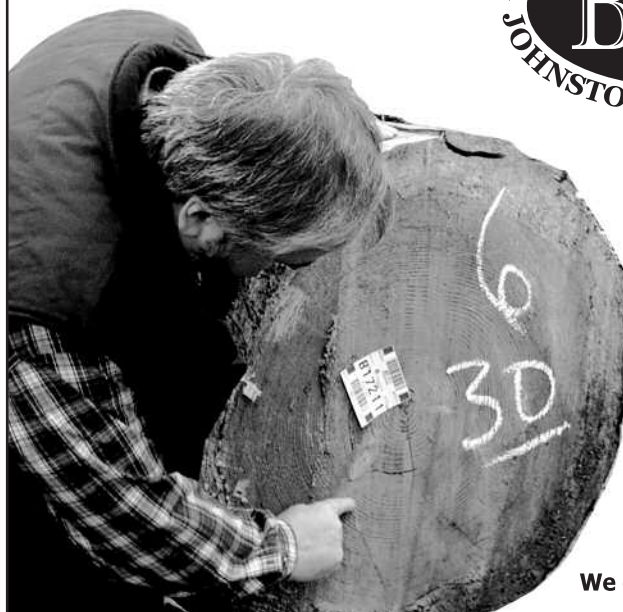
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# Increasing Forest Resilience with Fire

By **CRAIG BIENZ**

**Y**ou have been there before; all forestland owners have. You're looking at your stands of trees and wondering, what else should I be doing? Am I doing something wrong? How can I know that the trees I am managing today will be healthy and productive in the future?



When my wife, Kristin, and I bought our land with a dry ponderosa pine forest we knew that our management actions would determine the trajectory of those trees. Our neighbors and the previous landowner, Max, who had retired from work at Weyerhaeuser, were generous to share their knowledge of the land and past practices. Max explained that while some of the trees had been harvested, two forest fires over about 60 years had the biggest impact. These fires killed trees, but also destroyed the house in the first

fire and the barn in the second.

We were aware that interactions between historical fire exclusion, land use changes and a warming climate have increased fuel loads and fire hazard across millions of forested acres. Fuel reduction treatments (whereby surface and canopy fuels are removed through mechanical thinning and/or prescribed fire) are a standard management tool to reduce fire risk and restore the vegetative structure of ecosystems that have been degraded by past management and fire suppression.

We wanted to implement fuel treatments to moderate subsequent fire behavior, mitigate fire severity and increase forest resilience to future disturbances. Work in the forest has been a learning process for my wife and me. We were anxious to see how our actions affected the diversity of species, as well as the structure and growth of the trees. We had a lingering question about whether benefits would be realized when an unplanned fire entered the previously treated area.

## Forest management with fire

The time to protect your home and property from wildfire is before they ignite. The question isn't whether a wildfire will come, but when. Unhealthy, overstocked forests with heavy fuel loads create an environment that is at higher risk of severe wildfire. Within stands, fuel treatment effects vary by actions taken and the type, size and age of trees. Spatial arrangement and rate of implementation can affect outcomes at the landscape scale.

The history of wildfire and property damage, even loss of lives, is a subject that affects many Americans. Roughly 120 million people, or about a third of the U.S. population, live in what fire experts call the "wildland-urban interface" (WUI). Simply put, these are areas where nature and housing or other developments meet. Many acres of WUI (about twice the size of California) have been identified as high risk for fires; many residences and lands across the Northwest fall in this category.

My wife and I wanted to prepare our forest to withstand wildfire and survive for many years. Because we know that states spend a tremendous amount of money on fire suppression, that fires create a potential loss of clean water from forests and that forests affected by wildfire will absorb less carbon. After notifying the Oregon Department of Forestry, we



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removed most of the juniper and some younger pines to reduce the basal area in square feet per acre (BA) to between 60 and 80. Then, we trimmed low hanging branches up to six feet that could be potential ladder fuels and placed the branches in small piles. The following January, I burned the piles and the duff layer under the trees to the dripline, which was the edge of the snow. The layer of duff and litter was a foot deep in some places.



PHOTO COURTESY: CRAIG BIENZ

*Figure 1. Arnica nevadensis grew in the dripline burned areas and were not seen before burning. Removing the 10-inch mat of pine needles and litter provided an enhanced site for new conifers, and for flora and fauna previously not observed. If you look closely on the ray floret in the 10 o'clock position, you will see a small brown spider.*

Prescribed dripline burning reduced the heavy accumulation of litter and duff (fuels that could sustain a wildfire). Removal of the duff allowed seeds to reach mineral soil. The response in understory vegetation was dramatic: grasses and flowers flourished. Species appeared that I had not seen previously, like *Arnica nevadensis* (see Fig. 1). In contrast, sites that weren't burned had restricted vertical seed movement in the duff: seeds were unable to reach mineral soil in those areas lying beyond the canopy dripline. Mid-winter burning effectively removed fuels, prepared the sites for regeneration and was safe from unintended spreading; I have since learned that this isn't possible every winter, due to snowpack and my time constraints.

### Forest management by The Nature Conservancy

In 1980, The Nature Conservancy bought forestland and grassland in south-central Oregon. The Sycan Marsh Preserve is used as an ecosystem research facility for the marsh and surrounding dry pine forest type.

In 2005, we treated 178 acres of forestland with mechanical harvest. Pre-treatment density of trees greater than 4 inches DBH was 108.8 square feet per acre. There were also 255

smaller trees per acre. Sixty-six percent of the trees were ponderosa pine and the stand structure was uneven-aged. Harvest yielded 1552 cubic feet per acre. This area was included in

prescribed burns in 2006 and 2013.

In 2008, another 400 acres were treated with prescribed fire only, including 320 acres of forestland and 80 acres of grassland. Forest structure in this area was uneven-aged, with lodgepole pine being the predominant tree (51 percent of trees). Average gross volume per acre was 419 board feet in lodgepole pine and 765 board feet in ponderosa pine for a total BA of 335. The density was 57.1 square feet per acre with 103 trees greater than five inches diameter breast high (DBH) per acre and 40 saplings per acre (29 percent of trees).

Through our research, we discov-

—Continued on next page—

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ered that, to increase resilience, treatments should seek to restore the range of spatial patterns (heterogeneity) found in forests with intact disturbance regimes (not affected by local historic fire suppression). We also recognized that strict basal area or spacing-based prescriptions do not achieve this goal. In frequent-fire forests, managers across the West have found that native forests were not uniformly spaced, and that a spa-

tially complex pattern, sometimes called “clumpy-gappy,” provided essential ecological or functional roles. Variable spatial patterns affect a variety of functions, such as fire behavior, understory plant diversity, tree regeneration, insect spread, nutrient cycling and snow retention. So, in 2010, I changed the treatment prescriptions to designate individuals, clumps and openings (ICO) to provide a complex spatial pattern in the residual forest.

With this new structure template, mechanical treatments on 150 acres of ponderosa pine forest began on December 12, 2011. Three hot saws removed trees from 4- to 16-inches DBH. A designation-by-description mark guided the harvest to establish heterogeneity, and protect white-headed woodpecker nesting and foraging habitats. I found it necessary to mark leave trees to create the forest architecture needed post-harvest.

Designated skips—areas that would not receive harvest—were identified prior to treatment and flagged. Skips provide connectivity between open meadows and upland cover patches. Similar harvests continued on 326 acres in 2014 and 187 acres in 2016. An additional 405 acres are planned in 2017.

### Effectiveness monitoring

Fuel reduction treatments are prioritized on public lands to reduce wildfire hazard and spread, while improving forest health, wildlife habitat and aesthetics. In 2014, Nancy Grulke, Director of the Western Wildland Environmental Threat Assessment Center, and I began a project to evaluate the effectiveness of the fuel reduction treatments that I had initiated at Sycan Marsh. The treatments had all been finished: harvest (Mech harv and ICO), harvest with single prescribed fire (Rx fire)



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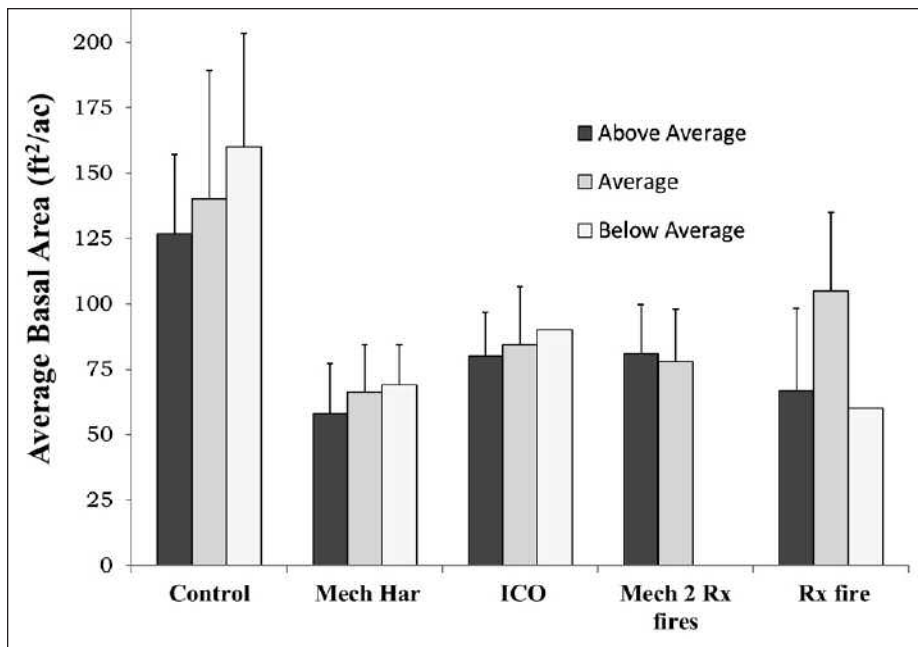


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Figure 2. Average BA in the five fuel reduction treatments in south-central Oregon expressed as above average, average and below average tree health.

and harvest followed by repeated prescribed fire (Mech 2 Rx fires).

Health and vigor assessments were conducted in 2014 and 2015 during a drought, which further challenged the response to the treatments. We've continued this research into 2017, expanding the effort to include more treatment types and sites.

Whole tree and canopy attributes (measured from the ground) are used

to assess the level of tree drought stress and health in the current year. Tree condition is categorized as above average, average or below average. Within the treated stands the BA ranged from 20 to 140, with the average in the mechanical harvest only treatment being 58 in above average, 66 in average and 69 in below average condition (see Fig. 2). Yet, in the harvest area treated with two prescribed

fires, the BA was 80.8 in above average and 77.9 in average condition. There were no trees in below average condition in the harvest area followed by two prescribed fires.

Average tree diameters were not significantly different between treatment types. In general, above average trees also averaged the largest diameters; the exception being the mechanical harvest with two prescribed fires where the above average trees had an average diameter of 40.3 centimeters (cm), and average condition trees had an average diameter of 42.7 cm. In the control area, tree diameters averaged 48.6 cm for above average trees, 36.9 cm for trees in average health, and 38.3 cm for trees in below average health. We concluded that: 1) fuel reduction treatments not followed by prescribed fire had a greater proportion of trees in poor health than unmanaged stands with the exception of later ICO treatments; 2) harvest followed by repeated prescribed fire

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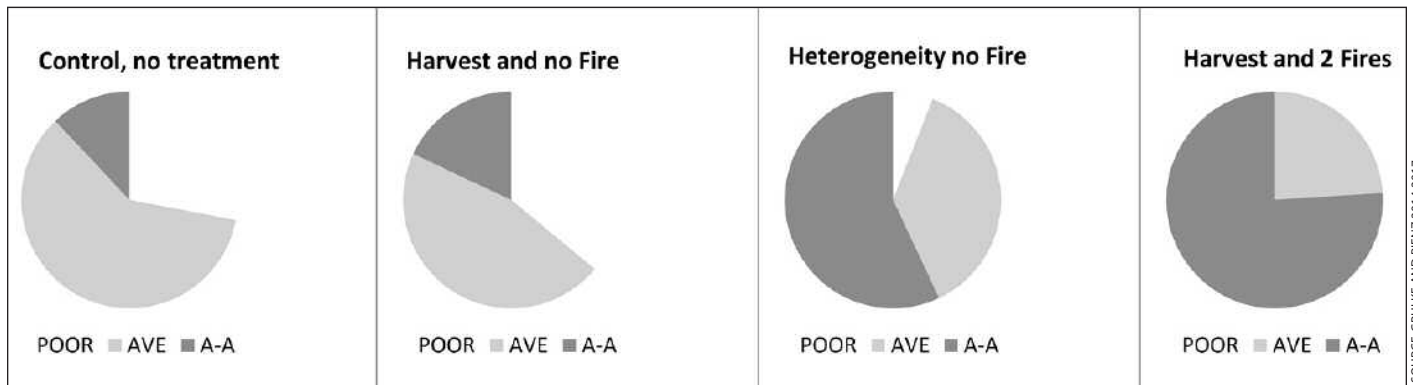


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SOURCE: GRULKE AND BIENZ 2014-2017

**Figure 3.** A visual representation of the results of fuel reduction treatments conducted in the dry pine forest type. Fuel reduction treatments followed by two prescribed fires seven years apart improved the proportion of above average trees by 60 percent. Harvest with two fires had 1.4 times greater bole diameter growth than other treatments, and diameter growth in the control and harvest with no fire were similar. Managing forest structure by increasing spatial heterogeneity increases resilience in drought, with 62 percent of the trees in above average condition.

eliminated all poor health trees; and 3) harvest followed by two prescribed fires seven years apart resulted in 75 percent of the population in above average condition (see Fig. 3).

### Management recommendations

Management in forests adapted to low- and mixed-severity fire increases our knowledge and understanding of ecology when we study the results from mechanical treatments, prescribed fire, wildfire and habitat conservation. We have learned how good scientific, ecological and social facets can guide management direction. Using fire as a tool in forest restoration will significantly improve the resistance to wildfire and drought, and will increase carbon storage.

Our actions do have a lasting impact on our property and the surrounding landscape. In my own forests, I have seen more resilient trees and regeneration of young ponderosa pines. Removal of fuel and

creating more open space between trees have reduced the risk of high-severity wildfire. In addition, the Bureau of Land Management, my neighbor to the south and west, has treated the adjacent stands. While we are not anxious for the next wildfire ignition, we have prepared our wildland interface property for the event.

### Continuing research

TNC's current research to evaluate individual tree health is continuing, with trees under different prescriptions and different environmental conditions, both adjacent to wetlands and in the uplands. To bring tree level information to the stand level, aerial imagery was collected in 2014 during the first year of drought in near infrared (850 nanometers) and red (650 nanometers) wavelengths at 30-cm resolution. Individual trees were identified spatially, using GPS, and evaluated for individual tree health to develop a signature of health, decline and incipient mortality from that imagery. We received imagery in 2016 to apply the calibration developed in 2014 between canopy attributes and spectral signature, to predict tree health and stand response to treatments. We began testing these predictions in 2016. The predictions are being assessed at both the stand and landscape level. We will continue to evaluate fire effects on tree health.

Healthy trees also show resilience

to disturbances like fire. So, in fall 2017, we will evaluate fire behavior effects within the individual treatment areas. Using a physics-based model, Russ Parsons (research ecologist with USDA Forest Service Fire Sciences Lab) will evaluate changes in fire behavior attributed to forest structure and past treatments. Brian Gullett (Environmental Protection Agency) will be evaluating the smoke and particulates associated with the prescribed fires. ■

**CRAIG BIENZ** works for *The Nature Conservancy in the Restore America's Forests* program. His areas of interest include spatial and temporal landscape and ecological processes, fire and hydrologic regimes, historic forest structure and species composition, and climate adaptation. His research includes evaluating the effectiveness of management actions to restore riparian and floodplain systems, and fuel reduction treatments in frequent fire forests. Craig has conducted research to evaluate the effects of wildfire, prescribed fire and forest management on cavity-nesting birds. He has worked in collaboration with the Klamath-Lake Forest Health Partnership, Lakeview Stewardship Group and Fremont-Winema National Forest to implement multi-party monitoring. Craig can be reached at 541-273-0789 or [cbienz@tnc.org](mailto:cbienz@tnc.org).

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# Contracts for Woodland Owners

**W**ithout a properly written contract, owners of small woodlands may find themselves in situations resulting in costly and time-consuming attempts at personal negotiations and the possibility of court battles. To help avoid these complications, it's important to learn and understand the basic requirements of a well-written contract before becoming legally bound by a written contract or oral agreement.

## Four basic elements are required for a valid contract:

1. Agreement—an offer by one party (the offeror) and an acceptance of the offer by the other party (the offeree)
2. Capacity—the legal competency to be a party to a contract
3. Consideration—the giving up of a legal right (the exchange of a promise for a promise in a bilateral contract or the exchange of a promise for an act in a unilateral contract)
4. Legality of purpose—meets local, state, and federal laws

Other important contract terms. Any contract that contains the four basic elements—agreement, capacity, consideration, and legality—may be a valid, enforceable contract. But it may not be a complete contract. Other important elements may be needed for clarification to avoid misinterpretation during a sale or service.

The elements of a contract will vary depending upon the nature of the sales transaction or the provided service. Some elements listed below will not apply to specific contracts; other elements not listed may be essential. This is not a comprehensive list of all elements that may be, or need to be, included in an enforceable contract.

Experienced woodland owners and forestry consultants strongly recommend that parties forming a contract choose a lawyer or lawyers experi-

enced in issues associated with the forest products industry to write a contract for the sale and purchase of forest products or for the hire of services.

The cost of a well-written contract will vary depending on the complexity of the sale or service. Hiring a lawyer who already has the expertise to write a clear, concise contract may save you time, money, and a great amount of frustration.

## The importance of written contracts

In many, but not all, cases, contracts must be in writing to be enforceable. A written contract may be enforceable even if it does not contain all terms intended by the parties. If enough basic terms were written down and the party against whom it is being enforced signed it, the other party can enforce the contract in a court. Enforcement of an oral contract usually requires legal proceedings, which can be costly and time consuming.

Among contracts that must be in writing to be enforceable, three kinds apply to forestry transactions:

1. Contracts for the sale of real

property or an interest in real property. Real property includes bare land and land along with property permanently fixed to the land, such as buildings. An interest in real property includes leases for land or buildings for more than a year, and easements.

2. Contracts that can't be performed within 1 year from the date of making the contract (not from the date of beginning of performance).

3. Contracts for the sale of goods for a total contract price of \$500 or more (for example, logs sold for a contract price of \$500 or more). In most states, including Oregon, standing timber to be cut by the buyer is classified as goods (not real property) in a timber sale contract without the land.

## How to develop a satisfactory contract

**Hire an experienced adviser.** If you are not experienced in writing contracts, you may need to hire an experienced consulting forester or legal advisor. Absentee woodland owners, in particular, should consider hiring experienced local consulting foresters to represent their interests in preparing an effective contract and supervising the operation to ensure fulfillment

—Continued on next page—

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of contract terms.

Consulting foresters often have sample contracts that have worked well in similar situations for other woodland owners. An experienced consulting forester can also recommend lawyers who have experience writing forestry contracts for owners of small woodlands. You should have a lawyer review sample contracts from a consulting forester.

After selecting a lawyer, you can take several steps to reduce legal costs and still develop a good contract:

1. Before consulting your lawyer, list your desired objectives of the upcoming timber sale or service.
2. Next, list the key elements needed to accomplish each objective.
3. Review the list carefully with your lawyer. Add, subtract, or amend items as necessary.
4. After your lawyer finalizes the contract, review it carefully. Compare the contract with individual objectives and key elements, including those listed below. Note any omitted or unclear points in the contract, and review these points with your lawyer.
5. Send the unsigned contract to the prospective buyer or contractor. After the other party returns it (perhaps with suggestions), review any suggestions with your lawyer and prepare the final document. Sign the contract and send it to the buyer or contractor for signature.

If you are performing repeated sales of timber or contracting for the

same services on different occasions, a previous contract may be satisfactory. However, applicable laws as well as individual needs and objectives can change. Always review the objectives of the new sale or service and ensure the contract meets those needs.

### **Elements that may be needed in a sales or service contract for a woodland operation**

**Location.** Include a legal land description for the sale of standing trees (stumpage) and road easements.

Include a portion of a map outlining sale areas or road locations, following natural or survey boundaries. Mark these clearly and tag them on the area proposed for harvest. Include the method of marking the boundaries in the contract. Be sure to include all maps, sketches, or anything referenced in the body of the contract.

A licensed surveyor must perform any land surveys and legal descriptions, but have your attorney incorporate the information into the contract to avoid any ambiguity.

**Term of the contract.** State clearly the beginning and ending dates for the agreement. Provide a means for granting extensions, if unseasonable weather makes it too difficult to log or if logging would harm the property. This is a very important clause.

Include a statement that each of the parties has had the opportunity to be represented, to the extent desired, by legal counsel of its choice

in respect to the transaction.

**Operation.** Include a clause to either suspend or terminate the operation when the seller alone determines that there is a failure to follow the terms of the contract. This is another important clause.

**Equipment.** Limit the kind of equipment used on the property according to the economic and environmental conditions that affect the operations (e.g., slope, soil moisture).

**Integrating modification.** The current agreement constitutes the entire agreement of the parties with respect to matters described and supersedes all prior written agreements.

**Compliance with law.** Parties shall comply with all applicable federal, state, and local statutes, ordinances, rules, laws, regulations, orders, requirements, and standards in effect or which arise in connection with parties' performance under the agreement and shall defend, indemnify, and hold harmless the other party from any and all claims, including attorney fees from the violation of such applicable laws.

### **Forest Practices Act and rules.**

Require adherence to the directives of the Oregon Forest Practices Act and Administrative Rules.

In Oregon, the logging operator is responsible for meeting state forest fire regulations. However, the landowner may require additional measures.

The contract should assign responsibility for payment of firefighting costs and damages from fires caused by logging.

**Residual stand protection.** Emphasize the importance of caring for "leave" trees, either in falling or in skidding. For a thinning or other silvicultural treatment requiring "leave" trees, establish a quantitative method of measurement and penalties for cutting unmarked trees.

Describe how trees are marked—for cutting, for the residual stand, or for the boundaries of a clearcut.

**Slash disposal.** Include specifications for slash disposal from timber harvest.

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**Roads, landings, bridges, culverts.** Specify location, construction standards, and maintenance of roads, landings, bridges, and culverts. Prepare these specifications in terms of future as well as present management objectives.

Buyer or lessee should be required to repair damage to existing fences, bridges, and roads—or pay damages.

**Easements.** Establish whether the buyer or seller is responsible for obtaining and paying for road access agreements and road maintenance and repair. Consider including a “Right to Relocate” clause.

Make certain that the buyer of forest products or lessor of forestland has the right to enter and work on the property, including the right to remove forest products sold under contract.

Include pertinent items of usage such as obeying speed limits, locking/unlocking gates, no permitting of drugs or alcohol, reporting threatened or endangered species, and providing fire protection.

Once all parties sign the easement, record the document as soon as possible to avoid any ambiguity in the terms of the agreement.

**Insurance.** List the types and amounts of required insurance. Insurance typically needed includes:

- General liability and motor vehicle
- Loggers’ excess property damage
- Workers’ compensation

Require proof of insurance and endorsements that require prior notice of any change or cancellation of the insurance. It is recommended to include seller or leaser as “additional named insured” on the contractor’s policy.

**Severance Tax and Forest Products Harvest Tax.** Under Oregon law, the owner of the forest product at the time of harvest pays these taxes. However, responsibility for paying these can be shifted to another party in the contract. If that party fails to pay the tax, responsibility for the tax

reverts to the owner of the forest product at harvest.

**State and federal payroll, income, and other taxes.** State that the buyer agrees to pay all taxes associated with his or her operation on the sale except those specifically exempted by the contract.

**Method of payment.** State how and when the buyer will pay for the stumpage, logs, or other forest products or services provided.

Provide a system for checking the volume and estimation of logs removed or delivered.

Describe quality control factors or assessment of services provided and according payment structure in relation to the successful completion of such services.

**Resolution of disputes.** Provide for arbitration of disputes if you don’t want court action. (Arbitration is usually cheaper and faster than a trial, and you can select an expert as the arbitrator.)

Provide for payment of reasonable arbitration fees to the prevailing party. Arbitration usually but not always is final.

**Mutual attorneys’ fees.** Whether or not there’s an arbitration clause, provide for payment of reasonable attorneys’ fees to the party prevailing in any suit or action for breach of contract.

**Waiver of breaches.** Include a clause that states that if the seller waives one breach or default of the contract, the waiver is not to be interpreted as giving permission for continued or future breach of the contract.

**Liabilities.** Require the buyer to keep all products harvested or timber purchased free from liens or attachments.

**Severability.** Include a clause that provides that if one or more provisions in the contract are illegal, the rest of the contract still is enforceable.

**Notice.** Provide for notice of breach of contract, and state how notice will be delivered.

**Signatures.** Place the seller’s and buyer’s names, legal addresses, and signatures at the end of the contract. If you have an agent, show the agent’s name and address. Include the date and place where the agreement was agreed upon and signed. ■

*The information in this article is published in Oregon State University Extension publication EC 1192 (Steve Bowers, July 2014) and is available for download at: [catalog.extension.oregonstate.edu/ec1192](http://catalog.extension.oregonstate.edu/ec1192). The 38-page publication includes example contracts for timber sales, logging, easements, road construction and improvement, tree planting, spraying and pre-commercial thinning.*



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# Forestry Tech Trends for Landowners

By **MAX NOVA**

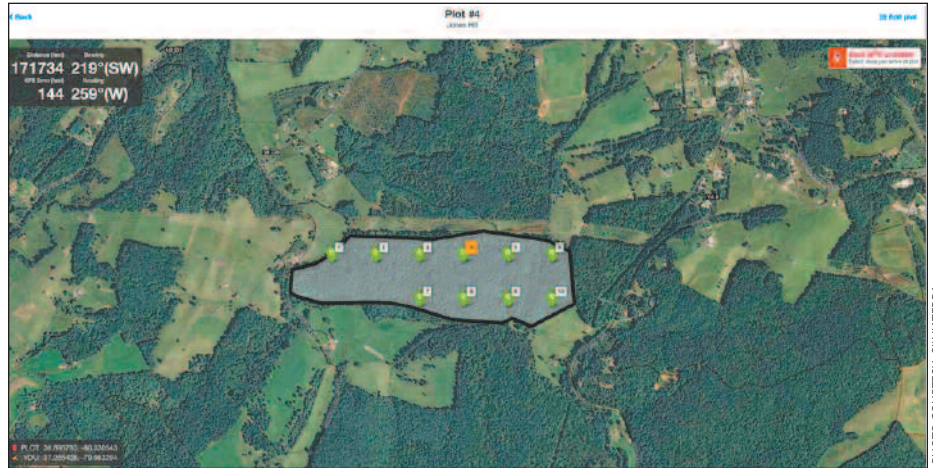
The last decade has seen an incredible number of technological innovations that are transforming the way landowners relate to their forests. From satellites and drones to smartphones and cloud computing, new technology is empowering landowners to monitor and manage their properties like never before. In many cases, private landowners now have access to tools that are just as powerful (and sometimes more so!) as those used by large institutional landowners.



At the same time, this explosion of new technologies can be a bit overwhelming. In this article, we'll cover several of the main technologies and tools that you can start using today to monitor and manage your forest.

## Smartphone apps

One of the biggest changes in the past few years has been the widespread adoption of smartphones. These devices are packed with sensors that are especially useful for landowners. The built-in GPS and compass in your smartphone can be used for mapping and for navigating to sample plot locations within your stand. You can use the integrated camera to document stand conditions and some apps can even use the camera to determine tree species. And, of course, the touchscreen is great for



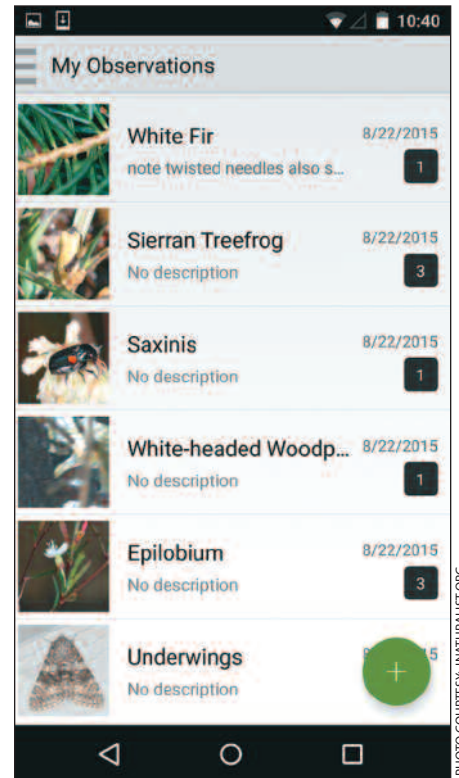
You can use *Plot Hound* to navigate to each of your sample plots.

data entry.

Smartphone apps are also a great way to get a younger generation of future landowners engaged with the forest. Here are a few of the apps that can turn your smartphone (and your grandchild!) into a forest data collection machine:

- Avenza Maps is a very popular free mapping app for iOS, Android and Microsoft mobile devices. You can load in your own georeferenced PDFs and geotiffs, or purchase data layers from Avenza's in-app store. You can also save and export placemarks as you navigate through your property.

- iNaturalist is a project of the California Academy of Sciences that helps you identify plant and animal species in your forest. When you take a picture with the app, it records your GPS location and uploads your picture to the iNaturalist website. Then, a community of experts helps identify your critter—for free! You're also acting as a "citizen scientist" and your



Get expert species identification with the *iNaturalist* app.

species sighting information is contributed to a global biodiversity database.

- Plot Hound is a free timber cruising app created by SilviaTerra that runs on your smartphone or tablet. It helps you navigate to each sample plot, lets you record the trees in the plot and then sends your data back to your account on the Canopy website



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PHOTO COURTESY: SILVIATERRA

*SilviaTerra's Plot Hound app makes it easy to record tree measurements.*

for reporting.

If you don't already have a smartphone or tablet, we'd recommend that you get an iPad mini. There's much more screen real estate on the tablet than on a phone, so you've got more room to work with navigation or data-entry apps. Most forestry apps can work offline, so you don't need to worry about buying a data plan or having a signal out in the woods.

### Extras

**Battery Extender.** If your phone's screen is set to maximum brightness and the GPS is running all the time, your phone battery probably isn't going to make it through the whole day. Luckily, there are a ton of battery extender solutions. We've had good luck with external battery extenders like the Jackery Bolt, but you can even buy cases for your phone that have built-in battery extenders.

**External Bluetooth GPS.** If you need high-accuracy GPS measurements, you should consider getting an external bluetooth GPS. Your smartphone's built-in GPS can usually get you down to about 30 feet of accuracy, but an external GPS can get down to 5-10 feet, even under the tree canopy. Running a GPS antenna consumes a lot of power, so you'll also get a big boost in your battery life if you offload that work to an external GPS unit. We've had good success

with the Dual X150 GPS and it's only \$82 on Amazon.

### Imagery

Popular free tools like Google Maps and Google Earth are empowering landowners to visualize their properties easily and instantly. In Google Earth, you can even drag a

timeline slider back and forth to view historic imagery of your property going back decades. This is a great way to tell a story about how your forests have developed over time and to share your forest management decision-making process with a new generation.

You can also use remotely sensed imagery to inform your forest management decisions. One big win you can achieve with imagery is to re-delineate your stand boundaries to make sure that similar forest types are grouped together. This will significantly reduce your cost of obtaining a forest inventory by reducing the amount of variability within each stand. Imagery can also be valuable for operational planning as you map out potential skid trails and landing sites.

If you want to go beyond the capabilities of Google Earth, you can get access to most of the underlying imagery for free. Google Earth prima-

*—Continued on next page—*

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rily draws from a U.S. Geological Survey (USGS) satellite mission called Landsat. You can search for and download these images for free from the USGS Earth Explorer website at: earthexplorer.usgs.gov. However, the Landsat imagery is only available at 30-meter resolution. If you want higher-resolution imagery, you can check out the U.S. Department of Agriculture's National Agriculture Imagery Program (NAIP) which has 1-meter resolution imagery that is often less than three years old. The NAIP imagery is packaged at the county level and is compressed with the not-particularly-user-friendly MrSID format. If you're feeling adventurous, you can find tutorials online for how to decompress NAIP imagery and view it.

And no discussion of imagery would be complete without a mention



*A grayscale one-meter resolution image from the National Agricultural Imagery Program.*

of drone technology. The last few years have seen a significant drop in the cost and training needed to acquire and operate a drone. The DJI Phantom 4 now retails for \$999. This drone can be operated from an iPad and the software has taken much of the complexity out of stitching drone imagery together. Federal regulations are now permitting more and more drone flights, so many landowners are wondering if it makes sense to purchase a drone for their own use. While they're certainly fun and the images are beautiful, in our experience at SilviaTerra, we have yet to see anyone making forest management decisions based on drone imagery that they couldn't have made with less time, expense and hassle using a satellite or NAIP image.

The world of satellite imaging is currently being shaken up by the emergence of several other new imagery platforms. There are new companies like Planet Labs that are operating massive fleets of hundreds of tiny "microsatellites" that are taking pictures of every place in the U.S. nearly every day. The resolution of these images isn't quite down to one meter, but that's just a matter of time. These new microsatellite vendors offer a simple and low-cost way to get recent, high resolution images of your property.

But there are many steps between getting an image of your property and having a statistically sound forest inventory. Several regional consulting firms are now using SilviaTerra's

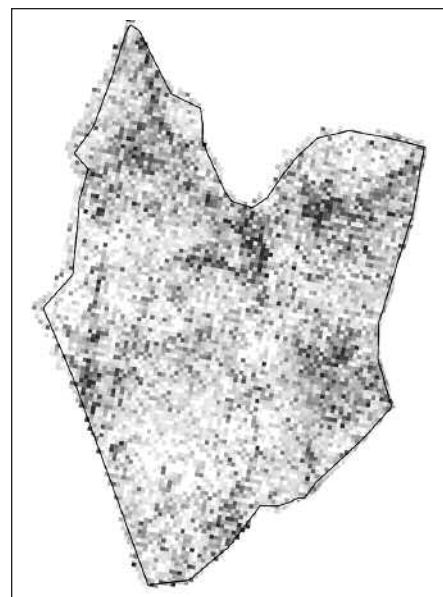


PHOTO COURTESY: SILVIATERRA

*Remote sensing can help "fill in the gaps" between your sample plots. This is a "heatmap" of timber volume across a property.*

CruiseBoost service to lower the cost of conducting a forest inventory. By pairing field measurements with the freely available satellite and aerial imagery we've discussed in this article, CruiseBoost fills in the gaps between your sample plots and enables you to get a more accurate forest inventory with fewer plots. Soon, we'll be rolling out a nationwide forest inventory data layer that landowners can access to get an instant forest inventory. Stay tuned!

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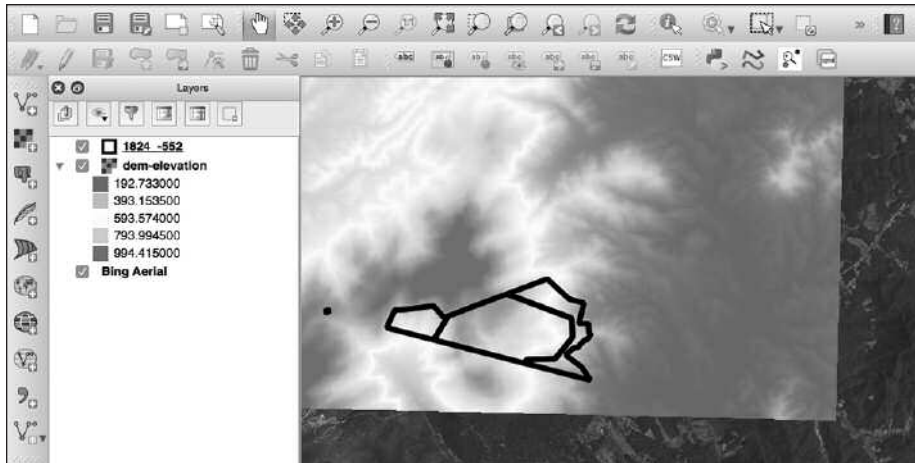


PHOTO COURTESY: SILVATERRA

The free QGIS software can help you perform advanced geospatial mapping and analysis. In this screenshot, we see stand boundaries overlaid on a free digital elevation map (DEM) from the USDA.

measurements and acquired imagery of your property, how do you begin to analyze it? This is generally a job for a piece of software called a “Geographic Information System” or GIS for short. By far and away, the most popular industrial-grade GIS system is ArcGIS built by ESRI. Unfortunately, a license for ArcGIS can run into the thousands or tens of thousands of dollars. Luckily, there is a free alternative that can do just about anything that you’d want to do. QGIS (qgis.org) is a free and open-source GIS system that runs on Windows, Mac and Linux. Using QGIS you can:

- import a satellite image as a base layer;
- pan and zoom to your property;
- draw a boundary around each of your stands;
- calculate the acreage of each stand; and
- export your stand boundaries in a shapefile that you can share with consulting foresters, loggers and others.

And that’s just scratching the surface. There are plenty of YouTube tutorials online for how to do advanced geospatial analysis of your property using QGIS. The site qgis-tutorials.com is a great place to start.

### The cloud

A final piece of the technological puzzle is the emergence of full-featured web applications in “the cloud.”

Most of us have used web apps like Facebook or Gmail that allow you to check your messages from any device with an internet connection. There’s a ton of engineering going on behind the scenes to make this possible, but the result is that we’re able to access incredibly powerful software tools running online without installing any-

thing but a web browser like Google Chrome, Firefox, Safari or Internet Explorer.

This is particularly useful for forest owners because many of the software tools used in forestry are complicated to set up and require a lot of processing power. There is now a new generation of web applications that integrate the software and data you need for forest management and make it available through a website.

A great example of this is FVS Online (forest.moscowfs.wsu.edu/FVSOnline/), which is supported by the forestry school at Washington State University. It’s a user-friendly way to access the U.S. Forest Service’s powerful Forest Vegetation Simulator that you can use to estimate the future growth of your forest. You just need to go to the website and then FVS Online will walk you through the steps; there’s nothing to install.

–Continued on page 31–

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<b>Mt. Vernon, WA</b>	Joe M.	(425) 210-5880
	Mark F.	(360) 202-9141

# TreeSmarts: Forest Research You Can Use

▲ TreeSmarts: Forest Research You Can Use appears in every other issue of Northwest Woodlands. Column editor Ed Styskel reviews research being conducted from a host of sources, sorts through the items of interest to family forest owners, and provides a short summary of the pertinent results in understandable language. If you have a suggestion to share with Ed, please contact him directly at [edstyskel@gmail.com](mailto:edstyskel@gmail.com).

▲ **An Ever-Changing Ecological Battlefield: Marijuana Cultivation and Toxicant Use in Western Forests.** Authored by C.M. Thompson, M.W. Gabriel, and K.L. Purcell. 2017. The Wildlife Professional, Vol. 11, No. 3, pgs. 42-46.

▲ A widespread and gruesome scourge of wildlife poisoning is happening on public, tribal, state and private lands across the United States, and the source is illegal marijuana cultivation. Illegal marijuana growers use and leave behind a wide variety of legal and illegal toxicants to protect their crop from rodents that chew irrigation lines and omnivores that raid food supplies.

▲ Scientists regularly find the carcasses of mule deer, gray fox, Steller's jay, raven and coyote that are victims of primary poisoning (direct consumption of a pesticide) and/or secondary poisoning (consumption of a poison-contaminated animal) at grow sites. Poisoned rodents may survive

several days, often exhibiting erratic behavior and moving outside their own territory. Predators may take their prey back to a nest or den to feed dependent offspring, or introduce the poison via nursing to their suckled young.

Small mammal predators, such as the fisher, marten and ringtail, or raptors, including the northern spotted owl and northern goshawk, may be at risk of accumulating toxicants at sub-lethal doses. Doses too low to cause direct mortality may still have individual- and population-level consequences through reduced immune response, decreased reproductive potential and increased susceptibility to predation. Some amphibians—including the California red-legged frog or mountain yellow-legged frog—are particularly vulnerable due to the synergistic effects of insecticide exposure and predation stress.

At one site in Oregon, researchers recently found 66 pounds of a wide array of toxicants, all within habitat used by fishers and northern spotted owls, both legally protected species.

Some invertebrates can accumulate rodenticide compounds in their tissue without negative effects and move beyond the grow site boundaries, thereby facilitating secondary poisoning at outlying sites.

Scores of dead insects are often scattered around poisoned animals, the result of eating a decaying carcass. Carbofuran, an insecticide banned in the U.S. but increasingly found at grow sites, is often the cause. In fact, the presence of dead insects on or around a carcass is an early indicator of poisoning via concentrated pesticides. Both carbofuran and malathion are so toxic that insects landing on the carcass die within minutes of contact.

Over the years, the kind of toxicants found at some sites has changed. It used to be common to see dozens of small D-Con packets widely distrib-

uted around a trespass grow site. Such bait stations may now have been replaced by the use of larger quantities—5- to 20-pound buckets—of older, but still readily available, anticoagulant rodenticides such as warfarin, diphacinone, cholecalciferol (which calcifies the internal organs of an animal that consumes it), or the neurotoxin bromethalin. Dogs have died after eating bait left around grow sites.

## Human hazards

Trespass grow sites often contain concentrated pesticides in unmarked containers that pose a severe danger to human visitors. Growers often store the bubble-gum-pink-colored concentrate of carbofuran in soda and Gatorade bottles. Just a drop is enough to kill an adult human. Bottles with the toxicant may lie on the ground for years until animal bites puncture them. The simple act of picking up the bottle without gloves to properly dispose of it may be enough to expose a person to the poison. If a child would pick up a bottle and sniff it or lick their fingers, the effects would be immediate.

Other avenues for human exposure exist as well. In one case, a bleach bottle used to reconstitute zinc phosphide insecticide was found lying in a sunny meadow. Heat caused the bottle to build up internal pressure, and when a scientist touched the bottle it exploded spraying phosphine gas.

## Toxic site cleanup & restoration

Not only are the logistics of cleaning and restoring remote locations difficult and expensive, the increased use of concentrated toxicants poses significant human health hazards and requires the presence of trained personnel. Some land managers use private, hazmat-trained contractors. Without reclamation, the toxicants associated with these sites will gradually disperse across the landscape via water and wildlife. ■



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# The Understory

The 2017 wildfire season ranks as one of the worst in the nation in terms of number of acres burned. The National Interagency Fire Center ([nifc.gov](http://nifc.gov)) statistics for the year as of September 17 show 49,588 fires on 8,464,280 acres. The annual averages over the previous 10 years are 52,332 fires on 5,753,532 acres.

Given the severity of the 2017 fire season, it's more than likely that some of us have forestland that was affected by wildfire this year. It's important to know that there are helpful resources available to assist with evaluation and restoration.

One of the most thorough publications for assessing damage and planning recovery is "After the Burn—Assessing and Managing Your Forestland After a Wildfire" by Yvonne C. Barkley. This Idaho Forest, Wildlife and Range Experiment Station and University of Idaho Extension publication (Station Bulletin No. 76, May 2011) is available to view online at: [extension.oregonstate.edu/sites/default/files/community\\_pgs/wildfire\\_after\\_the\\_burn\\_2011.pdf](http://extension.oregonstate.edu/sites/default/files/community_pgs/wildfire_after_the_burn_2011.pdf)

The publication begins with descriptions of forest types found in the inland Northwest. Some of these are considered "fire-based ecosystems." The author gives descriptions of the mechanics and behavior of wildfire, and how wildfire affects vegetation, wildlife, soil, watersheds and aquatic environments. This information provides a basis for you to evaluate the extent of damage to your trees and site conditions so you can prioritize treatments based on your objectives.

You may find that you have some emergency treatments that need to be done before heavy rain in the fall, so the author recommends completing the evaluation of your forest as soon as possible after the fire has cooled. A form is provided for this assessment, with tools to predict tree mortality by species, and erosion potential based on your soil survey. There is also valuable instruction on salvage logging, deterioration by insects and diseases, reforestation, invasive weeds, management of fuels and erosion control.

The Natural Resource Conservation Service (NRCS) and Farm Service Agency (FSA) offer technical and financial assistance for rehabilitation after wildfires. Links to each state's USDA Service Center are found

here: [offices.sc.egov.usda.gov/locator/app](http://offices.sc.egov.usda.gov/locator/app)

You will also find valuable experience and support among your fellow family forestland owners. Speaking to someone who has already been through the recovery process could be the best place to begin.

In many areas, Extension foresters are available for consultation and education about the condition and expectations for your property. There are also many helpful Extension publications that are available.

In Idaho: [uidaho.edu/extension/forestry/topic/fire](http://uidaho.edu/extension/forestry/topic/fire) or 208-885-7718.

In Montana: [msuextension.org/forestry/](http://msuextension.org/forestry/) or 406-243-2773

In Oregon: [extensionweb.forestry.oregonstate.edu/directory](http://extensionweb.forestry.oregonstate.edu/directory) or 541-737-1727

In Washington: [forestry.wsu.edu/staff/](http://forestry.wsu.edu/staff/) or 425-357-6017

Your state forestry or natural resource agency representatives are also available for technical assistance and may be able to help you evaluate conditions on your forest after the fire.

In Idaho: [idl.idaho.gov/forestry/service/index.html](http://idl.idaho.gov/forestry/service/index.html) or 208-769-1525

In Montana: [dnrc.mt.gov/divisions/forestry/forestry-assistance](http://dnrc.mt.gov/divisions/forestry/forestry-assistance) or 406-542-4300

In Oregon: [oregon.gov/ODF/Fire/Pages/AfterAFire.aspx](http://oregon.gov/ODF/Fire/Pages/AfterAFire.aspx) or 503-945-7200

In Washington: [dnr.wa.gov/programs-and-services/forest-practices/small-forest-landowners/forest-stewardship-program](http://dnr.wa.gov/programs-and-services/forest-practices/small-forest-landowners/forest-stewardship-program) or 360-902-1849



# Tips From The Treeman



Steve Bowers

▲ **DEAR TREEMAN,** I've been seeing  
▲ incredible numbers of hazelnuts  
▲ being planted around the valley. Then  
▲ I got to thinking about the  
▲ Willamette Valley ponderosa pine  
▲ and the KMX thing and the hybrid  
▲ poplar craze. Is this hazelnut thing  
▲ another flash-in-the-pan deal or is  
▲ this something different? —*Skeptic*

▲ **DEAR SKEPTIC,** I appreciate and  
▲ respect your skepticism, but there are  
▲ circumstances that differentiate the  
▲ fore-mentioned topics from the cur-  
▲ rent filbert frenzy. On the positive  
▲ side, we have Oregon hazelnut farm-  
▲ ers who have conducted successful  
▲ operations for decades. Far-and-away  
▲ the greatest difference in the current  
▲ infatuation with filberts involves mar-  
▲ kets: there is an active, worldwide  
▲ demand for them. Individuals experi-  
▲ enced in the management and pro-  
▲ cessing of hazelnuts may well be on  
▲ the road to economic prosperity.

▲ My concern lies in the novice: the  
▲ guy who reads some research paper  
▲ or predicates their decision on  
▲ extrapolating the results of some sort  
▲ of model. Models are for magazines  
▲ or department store windows: they  
▲ may be enticing, but do not exist in  
▲ real life. You may not look fat if you  
▲ heed their suggestions, but there's a  
▲ strong chance stupid may rear its  
▲ head.

▲ From a forestry perspective (hazel-  
▲ nuts lie somewhere between ag and  
▲ forestry, with full-scale production  
▲ occurring after a 10-year cycle), my  
▲ greatest concern involves location: it's  
▲ not just real estate, folks. If you don't  
▲ plant the proper tree in the proper  
▲ location, you are doomed to failure.  
▲ Some of the greatest concentrations  
▲ of acreages are in the mid-to-south-  
▲ ern Willamette Valley.

▲ This region has been called the  
▲ ryegrass capital of the world for good  
▲ reason. But you should ask yourself  
▲ why? Why, you say? Because many of  
▲ the soils have high concentrations of  
▲ clay and lack proper drainage. During  
▲ the depression era, my grandfather  
▲ raised oats for the War Department.

Each year they would inspect the fields and one year the inspector asked Gramp to identify the weed that was growing in the oats. He said it was "that damn rye," and complained that you could not eradicate the stuff.

The Feds were looking for a cover crop to aid in erosion and flood control along the Mississippi River. It needed a species that could tolerate high water tables, required little cultivation and was inexpensive. Gramp and the inspector agreed to a contract to grow rye instead of oats. I remember Gramp telling me that story over-and-over again when I would cross the road to see him after I got home from working in the woods. He chuckled recalling when, after the meeting with the inspector, he came home and told Grandma, "Mamma, we're gonna get rich growing a weed!"

Pardon the regression, but you gotta admit, a pretty cool piece of history. Let's give the prospective filbert farmers the benefit of the doubt on the economic viability of their impending operations. Traveling around the area, I see substantial acreages of filberts being planted in grass seed fields: areas currently growing grass seed because the site is not suitable for anything else! These locations, like many forestry settings, can sustain tree growth for upwards of 3,4,5, even 10 years or more. But eventually, the roots work their way to the subsoil and persistent high-water table, unable to develop a root structure capable of sustaining the tree, and it begins to die. Typically, about the time everyone is getting all excited about the economic future of their exploits. As they say in forestry: wrong tree, wrong place.

The way we see it, there will be large investments in hazelnut production that will be viable enterprises for years to come, as there will be

large acreages of hazelnuts that will show a glimmer of hope, only to fade away. You can't make a silk purse out of a sow's ear and you can't grow a filbert tree in a flood plain. —*Treeman*

**DEAR TREEMAN,** I am about to inherit 20 acres of forestland that is land-locked. I do not have an easement to the property, but I have heard people say you cannot be denied access. What is the best way to get started? —*Brandon*

**DEAR BRANDON,** We have investigated your dilemma, and you do indeed have a dilemma. The previous owner was allowed access to the property, passing through multiple landowners. Some may call this a "gentlemen's agreement," but it is more an example of adjacent neighbors sharing access for many years without any form of verbal or written agreement finalizing the process.

You will need a written agreement, recorded with the respective county, from each landowner. Some might submit your situation warrants access via a prescriptive easement: a legal remedy granting you access through adjacent landowners due to their neglect to place some sort of physical barrier, restraining you from using their property or road. This remedy would be pursued under the assumption they did not, or do not, want you on their property.

The prescriptive easement is a last line-of-defense: use it when all else fails. Because you have multiple owners along your access, I do not see this strategy culminating in a successful conclusion, both in financial terms for you and future, personal relations with your prospective neighbors.

Put on your big-boy pants, meet with your neighbors and see if you can reach some sort of agreement. You have several hurdles to jump, which will require patience, perseverance and some interpersonal skills. The deck is somewhat stacked against you (small acreage, low value surrounded by multiple, larger, more financially viable entities). So, good luck; hope for the best and cope with the rest. —*Treeman*

## Forestry Tech Trends for Landowners

continued from page 27

Another very user-friendly web app is MyLandPlan ([mylandplan.org](http://mylandplan.org)). MyLandPlan is developed and supported by the American Forest Foundation and helps landowners map their forest and develop and implement management plans for their property. It serves as a basic online GIS system and makes it easy for you to connect with local consulting foresters to help manage your forest.

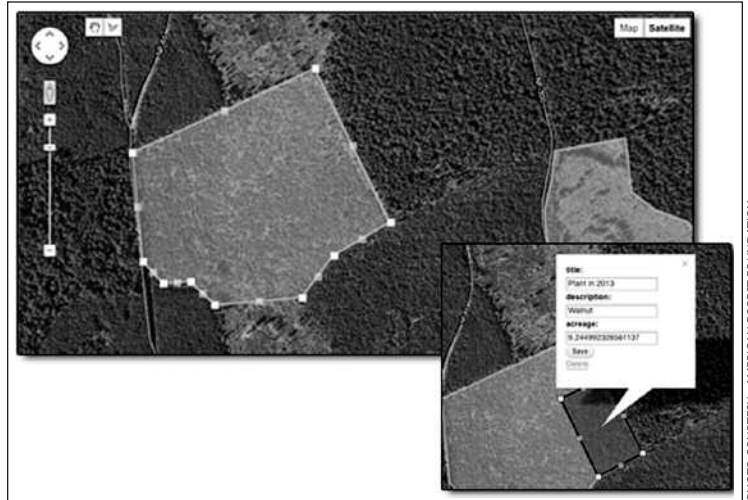
Canopy is a website ([silviateerra.com](http://silviateerra.com)) that you can use to draw your property boundaries and set up a grid of plots for a timber cruise. Once you sync the completed cruise

data from the companion Plot Hound mobile app, Canopy automatically generates free reports on your basic stand-level statistics, as well as graphs of your species and diameter distributions. If desired, you can also purchase reports with more in-depth statistical workups and calculations of your timber product volumes. *Northwest Woodlands* readers can contact us at [canopy@silviateerra.com](mailto:canopy@silviateerra.com) for a free volume report. Over 5,000 landowners and timber cruisers have signed up for free Canopy accounts and over 200,000 plots have been measured.

Technology for landowners has never been as affordable, powerful, readily available or easy to use as it is today. With this guide, you're now equipped to choose the right tech-

nologies for managing your property like a pro! ■

**MAX NOVA** is the founder of *SilviaTerra*. He spends his days helping foresters use technology to improve forest management. Using satellites, cloud computing and mobile technology, *SilviaTerra* has inventoried millions of acres of forest and helps the top U.S. timber companies use data to achieve their forest management goals. Born and raised in Louisville, KY, Max is a graduate of Yale University. He can be reached at [max@silviateerra.com](mailto:max@silviateerra.com).

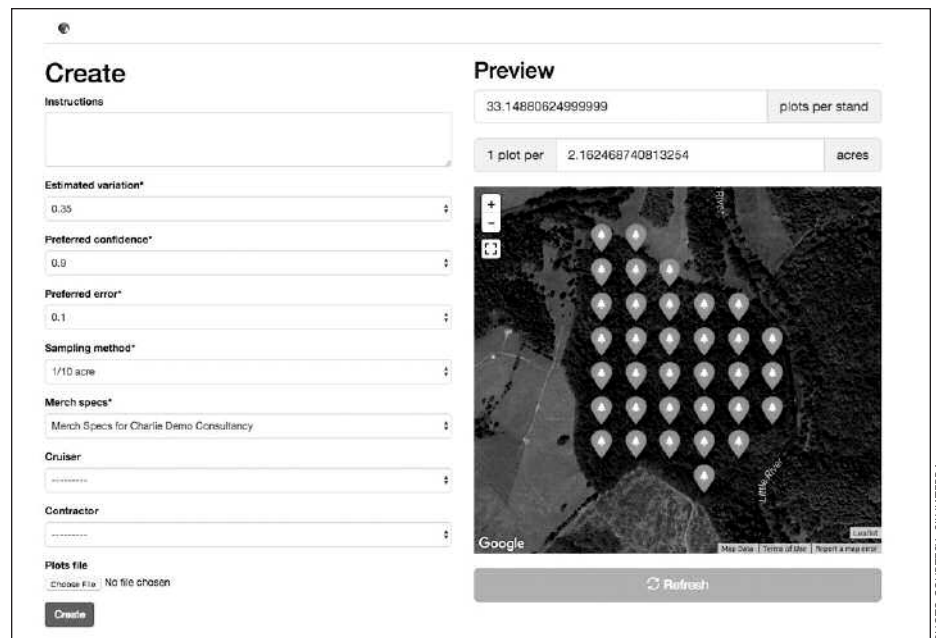


The American Forest Foundation's MyLandPlan website can help you plan the management of your forest and connect you with local forestry consultants.

PHOTO COURTESY: AMERICAN FOREST FOUNDATION

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SilviaTerra's Canopy website helps you lay out a grid of plots for your cruise.

PHOTO COURTESY: SILVIATERRA



Family forestland owners  
Dale Cuyler and Brenda Woodard

## Got questions? Get answers.

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