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FOREST STEWARDSHIP SERIES 21

Economic Considerations in Forest Stewardship

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Although you may own your forestland for various reasons, the fact is that your land is a significant financial investment. As with any large investment, it pays to learn about your options and then tailor your management to suit your needs. This publication briefly examines some of the more important economic considerations that may affect your management.

The first step in good economic management of your land is to understand what you can do with or produce on your land. This includes both timber and non-timber forest products and services. Whether you focus on timber or non-timber products, planning the management of your land will cost you time and money. Economies of scale will determine how extensive or detailed your planning should be. For virtually any property, a forest stewardship plan is essential to help you focus on your natural resources. It may be a very general plan, describing your property and what is on it, outlining future projects, and so on. The cost will depend on how detailed the plan is and how much of the work you are able and willing to do yourself. Some cost-share programs from state or federal agencies can help pay for these plans.

Objectives

Understand the economic aspects of forest ownership.

Competencies

- Identify commercial forest products, both timber and non-timber.
- Understand the economic considerations in timber harvest planning.
- Understand the economic and environmental advantages of forest certification.

Related Forest Stewardship Series Publications

- *Forest Taxation, Estate Planning, and Conservation Easements*, ANR [Publication 8252](#)
- *Laws and Regulations Affecting Forests, Part I: Timber Harvesting*, ANR [Publication 8249](#)
- *Professional Assistance*, ANR [Publication 8254](#)

TIMBER

Consider both existing and potential future timber resources and their values even if your objectives don't necessarily include harvesting timber. The monetary value of the timber was part of the price you paid for the property and will be part of the valuation of the property should you sell it, pay estate taxes on it, or restrict harvest with a conservation easement. Some trees will yield merchantable logs today, while others will yield merchantable logs in years to come. Trees that are yet to be established (either through planting or natural regeneration) will someday become merchantable.

For the short term, focus on what is merchantable now. To determine the quantity and quality of your timber, get help from a registered professional forester (RPF). The RPF will consider the species, size, quality, and location of the timber when estimating its value. Remember that log prices fluctuate widely from year to year and even within a given year. Your best sources for current local log prices are local RPFs and the log buyers at mills. For the longer term, talk to log buyers or your forester about what kinds of logs are most likely to hold their value into the future.

You might find it worth the time and expense to have a timber inventory done on your property. This means hiring a forester to provide you with a report that includes information on species present, with their numbers, timber wood volumes, and growth rates.

Based on the inventory, a forester can make a projection of future growth. It is probably wise to limit management decisions based on projected growth to a decade or two. Although growth can be projected a hundred years or more, growth models can provide only best guesses when done several decades into the future because they assume average levels of precipitation, insect and disease mortality, wildfire, and other unpredictable disturbances.

NON-TIMBER FOREST PRODUCTS

Products from your forest other than timber and firewood are called non-timber forest products (NTFPs). Your opportunity to develop NTFPs depends on many factors, including forest type, location, markets, and your interests. The commercial value of NTFPs in the Pacific Northwest exceeded \$200 million in 2006.

Native plants have been the backbone of the NTFP industry from its beginning. Some of the most commonly harvested products are listed below with their general use.

Use	Forest product
florals	evergreen huckleberry, salal, swordfern, Oregon grape, holly
medicinals	foxglove, yarrow, Rocky Mountain juniper, stinging nettle, Pacific willow
edibles	evergreen huckleberry, salal, swordfern, Oregon grape, holly, black raspberry, trailing blackberry, thimbleberry, salmonberry
fungi	morels, yellow chanterelle, white chanterelle, king bolete, shitake, matsutake, oyster mushrooms
Christmas greenery	Douglas-fir, Pacific silver fir, grand fir, shore or lodgepole pine, western white pine, western redcedar
craft materials	western redcedar, red alder, bitter cherry, western yew, pacific willow, vine maple, Pacific dogwood, Oregon grape
arts	paper birch, Pacific dogwood, blueberry elder, kinnikinnick, red-osier dogwood, Labrador tea, Oregon grape
landscaping	western redcedar, Pacific dogwood, Oregon grape, western white pine, paper birch, pacific willow, grand fir, Douglas-fir, salal, evergreen huckleberry, alpine fir, western larch, ponderosa pine, yellow cedar

The NTFP industry continues to develop niche markets for a host of new products, including the following.

Use	Forest product
florals	beargrass, Oregon boxwood, vine maple, red-osier dogwood, redstem ceanothus, pacific willow, scotch broom, hardhack, oceanspray, common snowberry, hairy manzanita, western bog-laurel, red huckleberry, Pacific madrone, Methuselah's beard lichen, coastal reindeer lichen, twisted ulota moss, cattail moss, yellow moss, maidenhair fern, deer fern, scouring-rush
medicinals	some examples of the more than 172 plants are: balsam, poplar, balsam root, bleeding heart, huckleberry, bunchberry, California bay laurel, devil's club, false Solomon's seal, fireweed, Labrador tea, licorice fern, madrone, nettle, Oregon grape, pearly everlasting, kinnikinnick, valerian, western coltsfoot, wild ginger, prince's pine, St. John's-wort, pacific yew
edibles	cattail, nettle, mountain sorrel, wild licorice, miner's lettuces, lamb's quarters, shepherd's purse, red huckleberry, mountain bilberry, elderberry, cloudberry, ponderosa pine nuts, currant, salal, bracken fern, burdock, wild ginger
fungi	giant puff ball, shaggy mane, candy caps, coral pink, cauliflower mushroom, chicken of the woods, hedgehog
Christmas greenery	Rocky Mountain juniper, noble fir, alpine fir, lodgepole pine, incense cedar, Port Orford cedar, coastal redwood, American holly, sugar pine
craft materials	sugar pine cones, Sitka spruce cones, common scissor-leaf liverwort, Douglas' neckera moss, cattail moss, antlered perfume lichen, coastal reindeer moss, Methuselah's bear, western yew, western red cedar bark, vine maple, bigleaf maple shoots
landscaping	cedar stumps, moss, lichens, ferns, native shrubs, native wetland herbaceous plants, native flowers, native trees, native grasses

North Canyon Creek on Indian Rock Tree Farm in El Dorado County. The stream has been restored and improved to support trophy-sized rainbow trout.

Photo: Richard Harris.



Indian Rock Ranch

If you were one of the approximately 10,000 annual visitors to the Indian Rock Ranch in El Dorado county, you know that this place is well cared for and cherished by owners Larry and Geri Hyder. This 34-acre farm employs 3 people full-time, plus the Hyderys year-round, and 18 to 20 people during the busy Christmas season.

Indian Rock Ranch is largely a choose-and-cut Christmas tree operation. The ranch supports Larry's love for fly fishing. Larry offers expert instruction in fly tying and fly-fishing. The scenic location is popular for weddings and other events. The property also provides timber milled on-site, supplying the ranch's need for lumber. The Hyderys also supply the bark for a reproduction of a native dwelling at the nearby Coloma State Historical Park.

It is difficult to believe that nearly 40 years ago when the Hyderys first acquired Indian Rock, much of the property was a badly eroded hydraulic mine. North Canyon Creek had been diverted from its channel. All of the timber-size trees had been harvested.

Larry and Geri have since planted thousands of Christmas trees, growing many of the seedlings themselves. They have stabilized eroding slopes and restored and enhanced the portion of North Canyon Creek that flows through their property. Rainbow trout from 1 inch to 30 inches and weighing up to 15 pounds fill the stream pools that Larry has constructed.

When you walk the property with Larry, his pride of ownership is clearly evident. He challenges visitors to name the benefits of adding wood chips recycled from Christmas trees and landscaping to the soil: he can name at least 12. The restored creek is home to a large population of rainbow trout, and the beautiful location is a joy to see. For more information, see their Web site, <http://www.indianrocktreefarm.com/>.

A few high-value NTFPs can make for commercially viable ventures. At this time, however, most NTFPs can realistically provide only supplemental income. Economic success in NTFPs comes down mostly to marketing. Who will buy your product? Will you provide raw materials, finished, or partially finished goods? Having a good plan and business sense to adapt to changing markets is essential.

PERMITS FOR SELLING TIMBER

Years of care and growth are accumulated in a mature timber stand. The return from all those years of asset (tree) growth is frequently marketed in a single transaction. Too much is at stake to sell timber without having accurate information on the process, products, volume, and value of the timber, as well as efficient methods for protecting the environment.

Selling timber is complicated. California landowners must have an approved timber harvest plan (THP) prepared by an RPF to conduct a commercial timber harvest. The actual harvest is usually done by a licensed timber operator (LTO, or logger). The net value of the trees to the landowner, called stumpage value, is the delivered price at the sawmill reduced by harvesting and transportation costs as well as the costs for harvest plan preparation and permits.

The state Forest Practice Act allows timber harvesting to occur in three general ways: with an approved THP, with a non-industrial timber management plan (NTMP), or with an exemption from a THP. These should not be confused with a forest stewardship plan, although many landowners have tailored their NTMP to be a forest stewardship plan. A THP is an environmental review document, much like an environmental impact report (EIR). It demonstrates that you are aware of the environmental impacts of your timber harvest and focuses on reduction and mitigation of those potential impacts. Though called a plan, a THP is actually a regulatory document, a permit to conduct timber harvest operations. As of 2006, a THP is valid for 3 years with up to two 1-year extensions. There are exemptions to filing a THP in the case of emergencies such as wildfire or other catastrophic events, or minimal-impact small-scale timber harvesting to reduce fire hazard around a home, and removal of dead, dying, or diseased trees. These are exemptions from filing a THP, not exemptions from environmental protection regulations for clean water and air, wildlife habitat, and so on. Approval of an exemption by the California Department of Forestry and Fire Protection (CAL FIRE) implies that all applicable regulations have been met.

Costs for THP preparation vary tremendously based on the scale and complexity of the plan and the environmental issues considered. A simple THP, with no streams, archeological sites, endangered species, or geological issues, will be an order of magnitude less expensive than a complex THP covering a large area.

As of 2006, there is probably no THP that costs less than several thousand dollars. A knowledgeable RPF can provide you with the best estimate of what a THP would cost. Ask several RPFs for competitive bids.

An NTMP is a long-term timber harvesting permit. In exchange for a great deal more up-front planning and limitations on the types of management activities allowed, landowners get an alternative to the THP that is valid in perpetuity. The NTMP can also be transferred with the sale of the property. To harvest timber under an approved NTMP, the landowner need only file a notice of intent to harvest (NOI). The main advantage to an NTMP is you can more readily sell your timber when markets are favorable while waiting out poor markets. Also the expense of a THP is borne only once.

If you choose to have an NTMP prepared for your property, it is extremely important that it reflect all of your stewardship objectives, not just commercial timber harvest.

Limited harvesting with an exemption is permitted for specific purposes such as salvage-logging dead trees, establishing or maintaining fire breaks, and dealing with emergency situations. While a few of these exemptions do not require the use of an RPF, most landowners are better off hiring one. In most cases, it is not in the best interests of the landowner to have the same person who logs the timber write the plan or an exemption.

STUMPAGE VALUE

The amount of money a landowner realizes from selling timber is called the stumpage price. It represents the value of the trees “sitting on the stump,” that is, the price the sawmill will pay for logs delivered to the mill less all costs for harvesting and hauling. Stumpage prices vary on a day-to-day, seasonal, and yearly basis, as well as regionally. Many variables affect the price paid for standing timber, including the following.

- Species. In California, Port Orford cedar for export commands the highest stumpage prices by far, though the amounts sold and markets are very limited. Redwood is the next-highest-valued species, followed closely by ponderosa and sugar pine, then Douglas-fir. White and red fir are still valuable but less so than their mixed conifer associates. In recent years, incense cedar has become a valuable species as a substitute for redwood in fencing and decking. Most hardwoods have little timber value except for specialty markets. Species price varies widely with location and market demand.
- Quality and size. Large, sound trees with clear (knot-free) logs used for lumber generally bring the highest prices. Logs with specific traits (straight, little taper, sapwood thickness) that produce quality utility poles command a high price.
- Location. Distance to the mill and the quality of the roads are crucial factors affecting the price paid for stumpage. A log truck leaves the property loaded and returns empty. The driver is paid for both directions. Fuel and maintenance is only slightly higher for a loaded truck than an empty one, and the truck owner still has to pay expenses whether the truck is loaded or empty. The distance from your property to a mill and the time it takes to negotiate the roads there and back play a big part in how much you can realize from selling timber. Lower elevations, below the snow line, may make your forest accessible earlier in the spring when competition for logs may be keener and prices are higher because of demand.
- Size and volume. Low total volumes of timber on small acreages may not be profitable to log. There are fixed costs incurred regardless of the size of your property or the size of the harvest. Logging operations require high capital investments in equipment; move-in costs are the same whether one truckload of logs or 100 are harvested. THPs are expensive. On small properties with low timber volume, the cost of preparing the plan can exceed the value of the timber. Stumpage values generally increase with harvested volume and acreage because of economies of scale.

- **Market competition.** Competitive bidding between mills in an area improves the chance that a fair market value will be offered for timber. Some situations involving specialized products, unusual harvesting conditions, or poor markets may be better handled by negotiating with an appropriate buyer.
- **Contract provisions.** Restrictions placed on the harvest of timber may protect the site or the landowner, but they usually reduce the price paid for the stumpage. The best way to assure your property will look the way you want it to following harvest is with a well-written contract that has specific, objective measures of performance; it is your property and you should be satisfied with the results. However, be aware that loggers bidding on your job will charge for contract provisions that go beyond state forest practice standards geared to ecological rather than aesthetic conditions. One of the most common sources of tension between landowners and loggers is the amount and distribution of logging debris (slash) left after harvest. Legal requirements for fire hazard reduction may not provide a cleanup that meets the expectations of landowners who cherish their land. You should include contract provisions that address slash and other considerations important to you. Clear communications, in writing and followed up by supervision, is the best way to ensure that your expectations of the harvest will be met.
- **Pricing.** One reality of marketing timber, especially for landowners who might make a timber sale only once or twice in their lifetimes, is that it is difficult to get accurate, timely information on prices. This can be a very expensive lesson.

Softwood lumber is a commodity, meaning that once lumber size and species are considered all wood of a given species is similar: an 8-foot long Douglas-fir 2 by 4 has the same lumber characteristics whether it comes from your forest or Canada. Commodity prices fluctuate widely according to international supply and demand and seasonal fluctuation. There are no daily market price reports for stumpage, nor are there any government support prices for landowners. Both demand and price for many timber products fluctuate widely.

This lack of information is one of the reasons to hire a forester you trust to look out for your interests. You need to have a professional advocate who follows industry trends and local market conditions.

Questions To Ask Your Forester When Considering a Timber Sale

- Which trees should I sell?
- How do I market them?
- Are property and cutting boundaries well marked?
- What is the timber volume?
- How is the volume measured?
- What is the value of my timber?
- Are timber market prices going up or down?
- Are the trees financially mature?
- Who and where are the appropriate timber buyers?
- What sale method should I use?
- What laws do I need to consider?
- How should I reforest harvested areas?

MEASURING TIMBER VOLUME

Training and experience are needed to accurately estimate timber volume and value within standards accepted by local markets. Actual production volume is usually determined at the mill, but the volume of standing timber can be estimated using several methods.

You should have at least a basic understanding of how timber volumes are measured. A timber “cruise” is an inspection of the timber stand to estimate the volume of marketable timber present. This ranges from a walk-through “eyeball” estimate to a sophisticated statistical sample that takes detailed estimates on some trees and extrapolates that information to an entire property. Most often, the cruise is based on a systematic sample of trees on plots or strips representative of the entire property. This information is summarized in a table reporting numbers of trees by species and diameter.

Two measurements are usually needed on each tree to estimate timber volume: the diameter at breast height (DBH), 4.5 feet above the ground, and the tree’s height. Tree height is gen-

erally recorded in terms of the number of 16-foot logs to a merchantable top of a specific diameter, or the actual top of the tree. Once the diameters and heights are known, tree volumes can be determined from volume tables. These tree volumes by species and DBH are expanded to the whole harvest area using estimates of the total number of trees by species and DBH.

Making square boards from a round log results in waste, though wood that doesn't make lumber is used for oriented strand board (OSB) or biomass energy. None of a log that comes to a mill today goes to waste. To account for this waste, various log rules are used to convert from gross measurements to a predicted net volume. There can be a great deal of difference between different log rules, so check to see which one your timber is estimated with. The state Franchise Tax Board uses Scribner Short Log scale, and that is the unstated standard in California.

MARKETING TIMBER

Being involved in selling your timber will bring the highest return with the greatest protection for your land. In most situations you will need to hire an RPF to help you market your timber. The RPF can handle many details, not the least of which is getting the best price for your timber and administering the timber harvest to achieve your goals and expectations. Use that professional's advice and experience wisely. Be well informed and aggressive in marketing. Buyers have more confidence in sellers who use a business-like approach.

Hire your own forester. Many logging companies have an RPF on staff and are willing to "take care of all of the paperwork." While this seems attractive, the forester is legally, ethically, and financially responsible to the person who is paying for their services. A forester paid by the logging company must work on behalf of the company's interests—not yours. Hire a forester you trust and who understands your needs and interests. Your needs and interests are best documented with a forest stewardship plan or forest management plan.

Make certain that your timber is ready to harvest. Are the individual trees large enough and plentiful enough to support a harvest? Will waiting a few years increase the value of the trees enough to justify waiting? To generate income from your forest without harvesting it, a short-term loan using timber as collateral could be less costly than a premature or inappropriate timber sale. You should get professional advice about various alternatives for the timing and intensity of the timber sale.

Being a commodity, the price of timber fluctuates widely. While over time the general trend is increasing timber values, the price can be highly volatile, so timing your harvest properly can result in significantly higher returns. For example, ponderosa pine went from \$195 per thousand board-feet (MBF) in 1977 to \$510 per MBF in 1990; however, in 1992 it went from \$470 per MBF in January to \$700 per MBF in July. Check the current timber market demand and recent trends. Landowners who are ready to take advantage of rising markets—those who have a plan in place—can make handsome returns. An approved NTMP would have allowed the landowner to take advantage of this brief price spike, while a THP would have taken months to process before a harvest could begin.

Obtain a good estimate of the volume and value of your standing timber to help you get the best return. Have the timber cruised to estimate its volume, quality, and value. It is surprising how many landowners offer tens of thousands of dollars in timber for sale without any estimate of just what they are selling.

Your forester may charge a daily or acreage fee, or may handle all sales-related activities on a percentage commission basis. A percentage commission provides a con-

sulting forester with a strong motivation to get the best price for your timber sale, although it could also encourage selling more timber or selling timber sooner rather than later. Daily or acreage charges might be less expensive, but they generally remain due even if no timber is sold.

In most timber sales, individual trees, or at least sale boundaries, should be clearly marked. Forest practice regulations require trees to be marked in some circumstances. Well-marked sales make it easier for the logger to bid accurately.

Inform adjoining landowners of any proposed timber sales to make certain that boundary and access road locations are acceptable. Neighbor notification is required as part of THP processing under the Forest Practice Act. Combining sales among neighboring tracts can sometimes increase volumes without substantially increasing logging costs, which could result in higher returns to the sellers.

Advertise the timber to all reliable buyers in the area. High-value products or tracts could attract buyers from far away. Buyers can best be notified by sending them invitations to bid on timber. Provide as much information about the timber, the tract, and contract restrictions as possible. Describe payment provisions, including any security deposits or performance bonds that will be required. Also include with the invitations copies of vicinity maps, plat maps, or aerial photographs indicating the location of the timber offered for sale.

Many marketing experts believe that sealed bids usually result in a higher offer than auctions or negotiated sales. Allow at least 1 month for buyers to make their own examinations or cruises before the sale is held. Reserve the right to refuse any or all bids. Consider hosting potential buyers at separate times. It could be a disadvantage to you for the bidder to know the identity of other bidders on the sale.

A written contract in which the rights and obligations of buyer and seller are detailed should be signed by all parties involved. Important restrictions and stewardship requirements should be included. You may wish to require a performance bond that is refunded to the buyer when all contract provisions have been satisfactorily met or used if necessary to correct contract violations.

The contract is used to pass title of the timber from the seller to the buyer. How this transfer is structured can influence federal and state taxes. Since everyone's tax situation is unique, it pays to consult an accountant prior to a timber sale. Be sure the accountant is familiar with timber-related transactions.

WAYS OF SELLING TIMBER

Common methods of selling timber include

- lump sum
- per unit delivered to a mill
- directly to the mill

Lump sum sales occur when you sell the standing trees to a logging company for a fixed price. This is rarely a good deal for landowners and in most cases should be avoided. Often the logger offers the landowner a fixed percentage of the price for the logs paid by the mill. Lump sum sales give the logger no incentive to do a good job; rather the focus is on cutting the best trees as quickly and cheaply as possible. Lump sum sales often leave a disappointed landowner and a messy job.

Lump sum sales are like telling a general contractor to build the best house possible for a fixed amount of money. When the house is built you hand over a check and take possession. Along the way you have little to no control over the design or materials that go into constructing the house.

Per unit sales occur when the landowner receives payment based on the volume scaled at the mill and verified by scale tickets. The agreement is usually for the landowner to receive a fixed price per thousand board feet delivered to the mill adjusted for species and log size. The logger sells the trees to the mill and the difference between what the mill pays and the landowner receives covers the logging and hauling cost and the logger's profit. Other costs associated with the harvest are documented in the contract. This method is used by most landowners.

To extend our constructing a house example, per unit sales would be like hiring a general contractor, giving them a careful plan, and paying along the way as certain aspects of the building are complete and the subcontractors paid.

Selling directly to the mill and contracting independently for either logging, hauling, or both is a popular method for sophisticated landowners with a lot of time and experience to manage a complex sale. As a landowner you make your best deal with a lumber mill, separately contract a logger, and pay the logger only for harvesting and hauling costs—usually at a fixed price per thousand board feet.

If this were building a house, the landowner would act as the general contractor, hiring subcontractors and paying them as their tasks are completed. The landowner is responsible for all scheduling and takes all the risk of the job coming in under or over budget.

CERTIFICATION

In the last several years, certification of well-managed forests has become increasingly popular. The idea behind certification is to provide some assurance to the public and consumer that the products from a certified forest are produced sustainably.

A number of organizations certify forests and foresters. These organizations vary in the parameters they evaluate as well as their level of rigor, cost, and scope. Some focus exclusively on forest management, while others also evaluate social and economic aspects such as selling logs to local mills, forest and mill working conditions, and maintaining good community relations.

Generally, certification involves a field verification, or audit, of the actual on-the-ground practices. In addition to time in the woods looking at everything from harvest sites to roads, the audit also includes a review of paperwork, such as management planning documents and harvest records. A written audit report is produced that goes on file with the certifier. Follow-up audits ensure that the certification standards continue to be maintained in subsequent years.

To date, the benefits of certification have been largely intangible. In some cases, auditors suggest or require certain practices that will improve the overall management of the forestry operation. As for financial benefit, while a few producers are able to obtain higher prices for logs harvested from certified forests, for the vast majority of participants the benefits are primarily personal and social. Certification can improve the image and credibility of a landowner, company, or forester. It also allows access into markets that demand certified products. However, at present, very few landowners actually receive a higher price for their certified timber.

It remains to be seen how the markets will respond to certified timber. There are some success stories. Certification may offer another way for you to market your timber. To sell your timber as “certified” requires that your logs go to a certified mill.

SUMMARY

Although selling timber can be confusing and complex, landowners can sell it successfully. Your timber sale may be your only chance to profit from the many years of annual growth and value that have accumulated in a mature timber stand. No single publication could cover all possible marketing situations, nor could it make you an expert timber seller. But there are questions you should ask and answers you should know. Hire an RPF before you sell your timber. Know what you are selling, when you are selling it, and how the sale is structured. Be an informed seller. Market your timber in a businesslike manner to get the most it will bring.

RESOURCES

To find registered professional foresters in your area, contact your local CAL FIRE office, which can be found in the state government offices listing phone directories under Forestry and Fire Protection Department. CAL FIRE has lists of both RPFs and LTOs. RPFs may also be listed in telephone directories under Foresters, Consulting. Further information on selected topics can be found below.

Non-Timber Forest Products

Everett, Yvonne. 1997. A guide to selected non-timber forest products of the Hayfork Adaptive Management Area, Shasta-Trinity and Six Rivers National Forests, California. USDA Forest Service, Pacific Southwest Research Station, General Technical Report PSW-GTR-162. Forest Service Web site, <http://www.fs.fed.us/psw/publications/documents/gtr-162/>.

McLain, Rebecca, and Eric T. Jones. 2005. Assessment of non-timber forest products. USDA Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-655. Forest Service Web site, http://www.fs.fed.us/pnw/pubs/pnw_gtr655.pdf.

Certification

The main certifiers active in North America are listed below. Note that different certifiers may operate under the same certification system. For example, both SmartWood and SCS use Forest Stewardship Council certification systems.

American Tree Farm System, 916-488-8322, <http://www.treefarmssystem.org/>.

American Tree Farm System, c/o American Forest Foundation, 1111 Nineteenth Street NW, Suite 780, Washington, DC 20036, Phone 202463-2462, Fax 202-463-2461, E-mail info@treefarmssystem.org.

Green Tag Forestry, National Forestry Association, 374 Maple E., Suite 310, Vienna, VA 22180, Phone 1-800-GRN-TREE, Fax 703-281-9200, E-mail info@greentag.org, Web site <http://www.nationalforestry.net/>.

Forest Stewardship Council (works through SCS and SmartWood),
Phone 802-244-6257.

Forest Stewardship Council U.S., 1155 30th Street NW, Suite 300, Washington, DC 20007, Phone 202-342-0413, Fax 202-342-6589, E-mail <http://www.fscus.org/>.

Scientific Certification Systems (SCS), Phone 510-832-1415; Dr. Robert Hrubes, 2000 Powell St., Suite 1350, Emeryville, CA 94608, Phone 510-452-8007, Fax 510-452-8001, E-mail: rhrubes@scscertified.com, Web site <http://www.scs1.com/>.

SmartWood, Goodwin-Baker Building, 65 Millet St., Suite 201, Richmond, VT 05477, Phone 802-434-5491, Fax 802-434-3116, E-mail (general information requests and inquiries) info@smartwood.org.

ENGLISH–METRIC CONVERSIONS

English	Conversion factor for English to Metric	Conversion factor for Metric to English	Metric
inch (in)	2.54	0.394	centimeter (cm)
foot (ft)	0.3048	3.28	meter (m)
yard (yd)	0.914	1.09	meter (m)
mile (mi)	1.61	0.62	kilometer (km)
acre (ac)	0.4047	2.47	hectare (ha)

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