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Managing forests to meet today's opportunities and challenges

forest

WISDOM

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Linking the Supply Chain Through a Forest Partnership

by Amanda Mahaffey and Ben Machin

Vermont attracts a lot of quirky, innovative people. In 2005, when the National Wildlife Foundation (NWF) approached Redstart Forestry and Consulting (Corinth, VT) about becoming FSC certified under the new "Family Forests" designation, forester Ben Machin and his colleagues decided to give it a try. The new category of certification would enable small woodlands to be audited to the FSC standard. To achieve this goal, Redstart would need to create a new model for achieving third party-certified management in a landscape dominated by family forest ownerships.

With the support of NWF and the Vermont Sustainable Jobs Fund, Redstart prepared for and completed an FSC audit. In the process, they contacted a number of sawmills and small manufacturers around the state who were interested in third-party certification standards. They discovered that parties on the buying end of the supply chain were having trouble getting reliable supplies of FSC-certified wood. At the same time, at the other end of the supply chain, there were landowners with FSC certificates that could not find a certified market for their wood. Without a way to connect supply and demand, certified logs were going into the commodity market. There had to be a better way to link sustainably managed wood products with niche markets.

In 2009, Redstart began a pilot project with Copeland Furniture, a furniture company that required FSC-certified wood, including a large component of sugar maple. Initially, Redstart was able to provide the wood because their client base, or woodbasket, includes a lot of sugar maple. However, as Copeland found new opportunities for FSC-certified red maple, Redstart soon realized that their network of landowners and foresters needed to be larger and more geographically diverse in order to guarantee this supply to the market. Redstart had become certified as a way to help others, not to gain a competitive advantage. It was to time broaden their operational base and scale up the model.

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Photo above by Bob Williams.

October, 2012

Dear Forest Guild members and friends,

One of the main reasons I like being a member of the Guild is the opportunity for continuous learning and the ability to make a difference in the forestry profession. The notion that as forest managers, we don't know everything and that the practice of forestry must be grounded in field observation and science is spelled out in our principles. Our principles foster an open willingness to learn and try new things and then share this knowledge with others. Our principles combined with the experience of our members enable us to have a say on important issues facing forests and the forestry profession.

With hundreds of professional members spread across the U.S., the Forest Guild has a tremendous base of knowledge that can be shared with other professionals and be used to inform local and national policy decisions. Publications like *Forest Wisdom*, research reports, meetings, and field tours are all ways the Forest Guild supports the forestry profession by being a viable source for information.

In the realm of local and national policy, the power of the Forest Guild membership can be seen in the policy positions that we develop (www.forestguild.org/policy.html). In the Forest Guild, policy positions are developed by the professional membership through the leadership of an elected body of members—the Membership and Policy Council (MPC).

On complicated and controversial issues such as climate change and forest biomass, Guild membership developed policy statements that affirmed our understanding of the issues and where the organization stood. These policy statements have not only served as a basis for evaluating local and national policy initiatives; they have served as the basis from which we pursue actions to increase understanding and improve practices. For biomass, our position statement served as a basis for our development of harvesting and retention guidelines in the Northeast, Southeast, and Pacific West. Our Carbon and Climate Change issue paper supported our efforts to understand the carbon implications of forest management and use of wood for energy.

On emerging issues, the Guild will need to continue to draw from the experience of its members to develop policy positions that can inform effective decision making while adhering to our mission and principles.

Our willingness to take a stand on complicated and controversial forestry issues is one of the reasons we exist as an organization. Our ability to do that relies on the power, knowledge, and experience of our professional membership.

The suite of articles contained in this issue of *Forest Wisdom*, encapsulates what is best about the Forest Guild—humility, openness to trying new things, and a willingness to share knowledge and experiences to benefit the profession and the practice of forestry.

Michael DeBonis, Executive Director

Forest Partnership, from page 1

Redstart teamed up with Allan Calfee, Andy Sheere, Jim Wood, Don and Nina Huffer, and Lynn Levine to form the Forest Partnership, a low-profit limited liability company, or L3C, to act as an aggregation hub for landowners to both pool together the timber resources and connect with manufacturers looking for local, third-party-certified wood. An L3C is essentially a hybrid between an LLC and a 501(c)(3) non-profit with the flexibility of a private entity but the expectation of a low profit margin. The Forest Partnership was set up to include members from a wide geographic area within Vermont and nearby states in order to broaden the supply base.

Growing the partnership also created a need for increased accountability. Fortunately, the success of the Forest Partnership is driven by trust between the foresters; nearly all of them are professional members of the Forest Guild. The same FSC standard is met by all foresters practicing within the partnership, and they work together to develop internal systems and standards. In fact, it is the element of leadership by foresters that sets this partnership apart from other existing efforts to bring landowners under the same certification umbrella.

The innovation of the Forest Partnership is not without challenges. For example, if the goal is to aggregate biomass supply and deliver to a wood user, such as a college, that supply chain links the landowner to the forester, to the logger, to the trucker, to the chipper, to the distributor, and finally to the client. When working with a furniture manufacturer, that supply chain might be still longer and more complicated. A furniture maker may only buy from one broker and that broker, in turn, from one mill; however, all the loggers with certified wood might be used to selling to other mills. How then can the supply chain be managed so that the right wood ends up at the right mill at the right time and everyone, including the landowner, is paid a fair price?

Since the Forest Partnership model deviates from the traditional system, it can be difficult to get supply chain participants to try something new. The forest products industry, however, is struggling, and a strong industry is needed in order to maintain healthy, intact forests. We seem to be in a window of opportunity for change. Consider, for instance, where the local food movement was 15 years ago, when getting locally grown food to a local restaurant seemed an impossibility. Similarly, every link of the wood supply chain is built on

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Ben Machin
Ben is a partner in Redstart Forestry and Consulting in Corinth, VT. As well as practicing forestry and natural resource consulting, Ben is a maple syrup producer and sheep farmer and enjoys tree climbing and horse logging.

Amanda Mahaffey
Amanda serves as the Northeast Region Director of the Forest Guild. A Guild member for nine years, she has been active in forestry and environmental consulting in Maine since 2004.

At left, a forwarder is fully loaded with white pine.
Photo courtesy of Long Wood Forest.

Cover photo at top, skidding white ash.
Photo courtesy of Long Wood Forest.

Cover photo at left, Ben Machin atop a certified red pine log pile.
Photo courtesy of Redstart Forestry and Consulting.

Innovation in Pine Silviculture: Natural Regeneration of Loblolly Pine on Maryland's Eastern Shore

by Alex Finkral, Fred White, and Matt Sampson

Alex Finkral
Alex is the Senior Forester with The Forestland Group, LLC (TFG). A professional Forest Guild member, he received an MF and PhD in forestry from Yale.

Fred White
A founding member of the Forest Guild, Fred is the Chief Forester Emeritus with TFG. He has a BS from the University of the South and an MF from Duke.

Matt Sampson
Matt is the Director of Forest Operations for the Northeast region for TFG. He has a BS and MBA from Virginia Tech University.

Introduction

Loblolly pine *(Pinus taeda)* is among the most common tree species in the nation, comprising more than half of the standing pine volume in the Southeast and dominating about four percent of forested acres. Loblolly is best known as a fast growing species that performs well in managed monocultures in the southeastern U.S. and increasingly in countries such as Brazil, South Africa, and Australia.

From an ecological perspective, loblolly is among those species that have benefitted from widespread fire suppression efforts. Frequent, low-intensity fires were once common in the southeastern U.S. They were part of a disturbance regime favorable for the growth and development of longleaf pine (*Pinus palustris*), a species with a dramatically reduced range today (*Forest Wisdom* 12, 2008, www.forestguild.org/Publications.html). From a management perspective, loblolly arguably is among the best species for production forestry, hence its popularity in the U.S. and internationally.

Much is known – and has been written – about the ecology and management of loblolly, particularly as a species planted in rows for relatively short rotations. By some estimates, as much as 99 percent of loblolly acres in the U.S. are regenerated artificially. Indeed, innovations in planting stock, silvicultural treatments, and nutrient inputs have resulted in impressive increased growth rates and decreased rotation lengths of loblolly. We are finding that natural regeneration of loblolly, however, is a viable and lower-cost alternative, appropriate for less intensive management scenarios such as those taking shape on sites on Maryland's Eastern Shore.

Eastern Shore Forest management

Most of the forests on the Lower Eastern Shore and in southern Maryland are privately owned. Most are managed for multiple objectives, but chiefly for revenue from the sale of timber and for wildlife habitat to support wildlife-related recreation. The forests on the Lower Eastern Shore tend to be dominated by either loblolly pine or a mix of southern hardwood species, including many oaks

(*Quercus sp.*). Most of the forests are even aged, having regenerated either from the abandonment of agricultural land in the middle of the century or from previous clearcut timber harvests.

Of the many commercial products that a forest on the Eastern Shore can generate, the most valuable is loblolly pine sawtimber. Markets for loblolly traditionally have been strong because of the many local sawmills engaged in the production of dimensional lumber and structural timbers. Stumpage rates have slipped recently, however, currently averaging between $100-$200/MBF (thousand board feet) depending on the quality of wood, tract accessibility, and local market fluctuations. Most mature pine stands are well stocked and average 8-12 MBF/acre. A clearcut harvest could generate $800-$2,400 per acre in stumpage revenue.

There is also a market for pine pulpwood and, to a lesser extent, hardwood pulpwood; and prices are low compared to other parts of the Southeast. Despite the abundance of the hardwood forest, there are very limited markets for hardwood sawtimber, whether it occurs mixed with loblolly or in pure stands.

As a consequence of these market and growing conditions, most Eastern Shore landowners who desire a commercial return from their forestland focus on loblolly pine. Management of loblolly pine on the Eastern Shore varies considerably from practices elsewhere in the Southeast. For the most part, Eastern Shore landowners choose to manage extensively rather than intensively. Many stands are managed for natural regeneration and relatively long rotations, typically 40-60 years old. Additionally, most regeneration is done with minor site preparation, typically only a chemical release treatment. Intensive management practices (such as mid-rotation fertilization and competition control, pre-commercial thinning to control sapling stocking, and bedding for site preparation) that are all common elsewhere in the Southeast are not common on non-industrial private forestland on the Lower Eastern Shore, although they are occasionally pursued.

In recent years, the Eastern Shore has become a focal point for forest conservation and management through efforts of the State of Maryland, private landowners, and conservation NGOs. The Forestland Group (TFG), a timberland investment management organization that manages timberland funds on behalf of investors, purchased approximately 22,000 acres of Eastern Shore forestland in 2003. The forestland was acquired from Glatfelter Pulpwood Corporation which had used intensive practices to produce pulpwood in 25-30 year rotations for their chip mill facilities in Delmar, DE and a paper plant in Spring Grove, PA.

While TFG also has strong interests in revenue streams from timber production, the company seeks to increase other, diverse values in properties, such as wildlife habitat and carbon sequestration. TFG typically focuses on natural regeneration processes and lower-intensity, lower-cost management approaches which often fit in well with conservation objectives.

On this particular forest, a conservation easement is held by the state of Maryland that is designed "to perpetuate a sustainable working forest… encourage the long-term professional management of those forest resources… facilitate the biologically and economically sustainable production of the forest resources… and conserve and preserve the significant conservation values of the property, including the natural,

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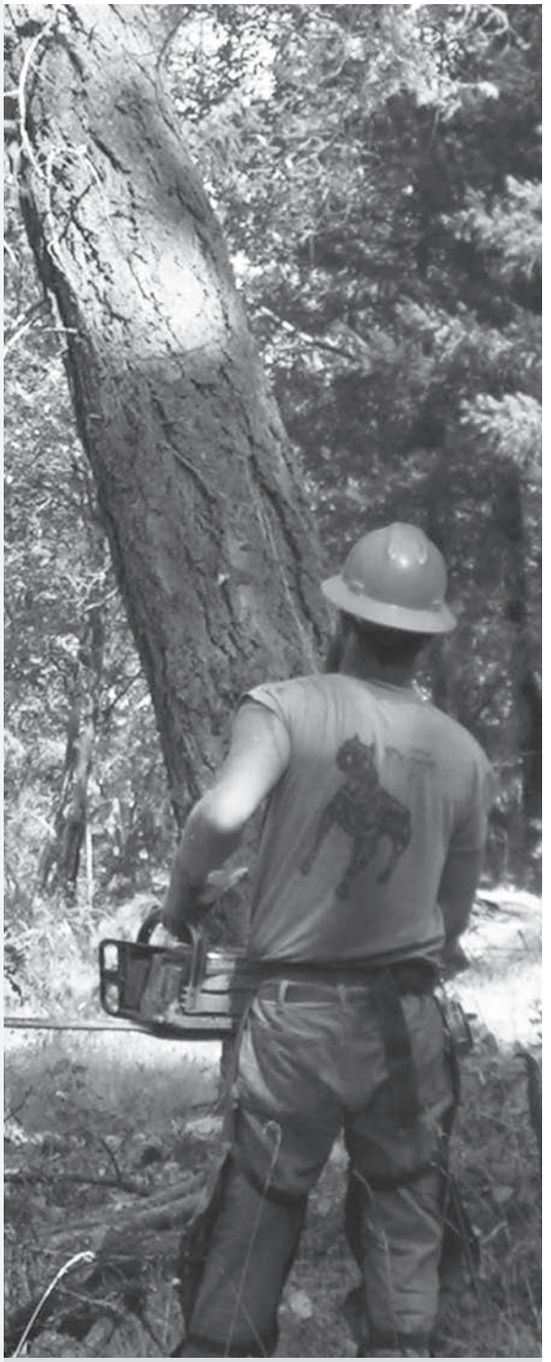
Above, wild lupine, a threatened plant species in Maryland. Photo by Alex Finkral.

On opposite page, five-year-old loblolly regeneration, released with a low-dose herbicide application in year two. Photo by Alex Finkral.

On opposite page, the authors from left to right, Alex Finkral, Fred White, and Matt Sampson. Photo by Larry Walton.

> *"The Forestland Group's natural regeneration of superior loblolly seed stock is the first attempt to do so on the Eastern Shore."*



At right, Jake is felling an 80-90 ft. Douglas-fir to release nearby white oaks. Photo courtesy of Jake Robinson.

Jake Robinson

Jake is a forester and professional Guild member living in Coos Bay, OR. Jake has been doing business in southwest Oregon for the last 10 years as Yankee Creek Forestry. His clients are primarily small non-industrial forest landowners looking to achieve multiple benefits from their lands.

The Oak Habitat Conservation Project

by Jake Robinson

When most folks think about classic Pacific Northwest forests, they probably consider the majestic late-seral, west-side conifer stands, with large conifers and lush understory. Douglas-fir (*Pseudotsuga menziesii*) often dominates, with a mix of western red cedar (*Thuja plicata*), Western hemlock (*Tsuga heterophylla*), Sitka spruce (*Picea sitchensis*), and several species of hardwoods. They might also picture the dry eastside forests, with scattered large Ponderosa pines (*Pinus ponderosa*) and thickets of lodgepole pine (*Pinus contorta*). In between these two habitat types is a somewhat overlooked forest type, with the low valley habitats being dominated by Oregon white oak (*Quercus garrayana*).

Over the past century, Oregon white oak and California black oak (*Quercus kelloggii*) habitats within this region have drastically declined, both in abundance and vigor. In Oregon, it is estimated that only five to eight percent of the historic distribution is still intact. Oak woodlands and savannahs in both California and Oregon are richer in wildlife than any other terrestrial system. More than 300 vertebrate species, including dozens of resident and migratory bird species, are known to use oaks. Oak habitats are also important contributors to biodiversity in the Pacific Northwest, hosting communities of flora and fauna that are vastly different than adjacent agricultural fields and conifer forests.

Yet, in spite of the biological and ecological importance of oaks, their abundance and distribution continue to decline. Historically, oak stands often occurred in valleys and lowlands, which became agricultural and subsequently residential lands. This habitat loss, combined with a drastically altered fire regime, has severely degraded this valuable habitat. Conifer encroachment is rampant due to lack of frequent low-intensity fires. Where conifer encroachment is not an issue, there is often the establishment of dense, young oak stands that lack the structural diversity of older stands, produce fewer acorns, and have uncharacteristically high fuel loads. Often the native understory of bunch-grasses and forbs has been replaced by exotic species, such as Himalayan Blackberry (*Rubus armeniacus*), Hawthorn (*Crataegus monogyna*), and Scots (or scotch) broom (*Cytisus scoparius*).

The change in vegetation has affected entire watersheds by reducing water yields and increasing the chance of high-intensity, stand replacing fire events, leading to increases in erosion and sediment delivery to streams. Existing oak habitat is minimized and fragmented with current forest condition not likely to mature into additional prime oak habitat. In the southern portion of the range, mistletoe infestation has become a serious problem, with many of the existing older oaks barely holding on.

In an attempt to reverse the decline in the region's oak forests, a collaborative effort was put forward that sought to use innovative methods, both funding and prescriptions, to improve the future for white oak-dominated habitats. This collaborative project is part of an NRCS-funded Cooperative Conservation Partnership Initiative (CCPI) led by the Lomakatsi Restoration Project, in Ashland, OR.

Different landowners have different goals for their property. Some of the project participants focus solely on improving oak habitats on their property. Others are ranching operations looking to improve wildlife habitat while also increasing the grazing opportunities by reducing canopy and attempting to control invasive species. These ranches (usually over 500 acres) are the last stronghold of continuous stands of oak, though they are declining. Current condition for the oak stands I have worked with range from nearly intact and functioning properly to incredibly over stocked and in severe decline.

Within this project, my role as a private forester is as a Technical Service Provider (TSP) developing the required forest management plans for clients wishing to become eligible for project funding. I describe the current conditions of the property's forests and develop site-specific prescriptions and associated NRCS job sheets which achieve both the goals of the property owner as well as the project partners. I completed three plans in 2011 and have two in progress for 2013.

One of these plans is for an 1,100-acre cattle ranch, with about 720 acres of forest, located outside of Roseburg, OR. The landowner's goals are to improve the grazing conditions on the ranch, increase the wildlife habitat, and maintain the oak forests. Current conditions of the forestlands are very high stem counts, severe infestation by non-native species, and conifer encroachment. Scattered throughout the property are crowned white oaks >2'DBH and a few larger, open mature Douglas-fir > 4'DBH, remnant structures from the original oak dominated stands. Of the 720 forested acres, approximately 150 are considered white oak savanna, 300 are white oak woodland, 180 are mixed oak/conifer, and 90 are mixed conifer evergreen.

Prescriptions for each stand are based on the desired future conditions for each forest type and the current conditions. The following prescription is for one of the more interesting stands on the property;

Treatment description for stand 7B: matrix oak woodland and mixed oak conifer with some small meadows

This young stand is a combination of two distinct forest types intermingled at such a

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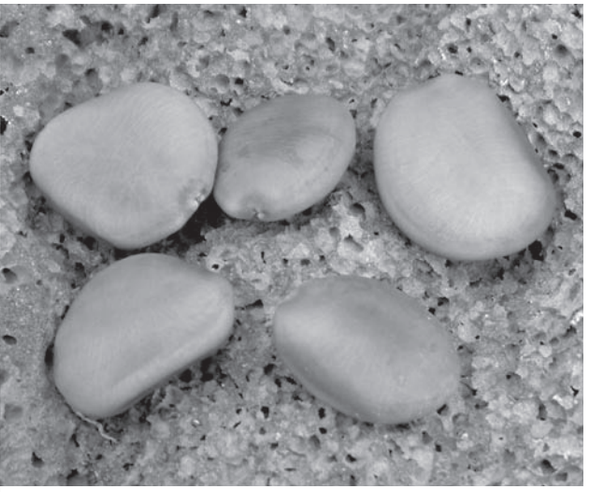
Yet, in spite of the biological and ecological importance of oaks, their abundance and distribution continue to decline.

At left, white oak with mistletoe infestation. Photo by Jake Robinson.



Restoring Forests with Aloha

by Travis Idol

Travis Idol
Dr. Travis Idol is Associate Professor of Tropical Forestry and Agroforestry at the University of Hawaii-Manoa. His research interests include restoration and management of koa (*Acacia koa*) forests, design and analysis of agroforestry systems, and forest nutrient cycling. He is also President of the Hawaii Forest Institute, which sponsors the Kaupulehu dryland forest project featured in this article.

Forestry in Hawaii is as unique as the islands themselves, where plant and animal species evolved in geographic isolation for millions of years. Humans have since introduced thousands of non-native species, creating daunting challenges for land managers trying to conserve and restore these unique resources. At the same time, there is a rich history of forest use and management by native Hawaiians prior to European contact that is increasingly serving as a model for community-based forest management projects. This article highlights just a few of the outstanding examples of these projects that seek to integrate natural and cultural values in the management of our unique forest ecosystems.

Kaupulehu dryland forestry project

The western side (or Gold Coast) of Hawaii Island contained extensive areas of tropical dry forests. More than 90 percent of these forests have been severely degraded or converted to other uses. The Gold Coast is also the site of continuing expansion by residential and resort developers. Upslope from the resorts and right off the highway serving those expanding residential areas is a 76-acre dryland forest being restored by the combined efforts of community members, public and private school students, and even groups visiting from mainland universities. Called Kaupulehu Dryland Forest, this preserve, owned by Kamehameha School and managed by the Hawaii Forest Industry Association, represents the challenges and potential of dryland forest restoration in Hawaii. Remnant native woody vegetation exists over a sea of invasive grasses that prevent native plant regeneration and carry destructive wildfires.

In the early 1990s, Land Asset Manager Peter Simmons helped evolve this project from an occasional but important protection effort to a more comprehensive restoration project. Today with the help of several hundred volunteers and a couple of interns, site manager Wilds Brawner is able to clear and outplant several new acres per year while maintaining fence lines and existing restored areas. Volunteers at Kaupulehu don't just get their hands dirty pulling weeds and planting natives; they also get a lesson in native Hawaiian culture and history from outreach coordinator Yvonne Carter. Many of the native plants and trees in this area were and still are used by local Hawaiians for food, medicine, cultural ceremonies, and as wood for tools, utensils, weapons, construction timbers, and other purposes. The value of these restored parcels is contrasted against the surrounding landscape of degraded and converted forests.

Dryland forest restoration starts with the basics: fencing and fire breaks. Since native Hawaiian plants evolved in the absence of mammalian grazers or browsers, they are vulnerable to

damage by feral pigs, goats, sheep, deer, and even donkeys that are present on Hawaii Island. Also unique is that fire is an infrequent natural disturbance in Hawaii's dryland forests. Thus, fire breaks are necessary to protect vulnerable native woody species. Once the boundaries have been secured, areas of one to a few acres are subject to intensive restoration efforts: mechanical control of non-native grasses, herbicide application to prevent regrowth, establishment of irrigation lines, outplanting of native species, and follow-up weeding. Volunteers contribute primarily to outplanting and follow-up weeding.

Initial outplanting is with a diversity of common native species. The goal is to recreate habitat suitable for particular threatened and endangered (T&E) plant species. Once the native plant community is well established, maintenance needs decline, and the focus can shift to restoring T&E species. The U.S. Fish & Wildlife Service provides consultation on the selection of species to ethnobotanist Jill Wagner, who propagates seedlings for outplanting. Due to the dry conditions and continuing threat of invasive species, natural regeneration is sporadic, and periodic maintenance will always be required. However, the involvement of the community in both intensive restoration and continual maintenance has grown over time, increasing the capacity to restore the natural and cultural values in Hawaii's dryland forests.

Lai Opua drylands forest project

An example of this increased capacity is the addition of Lai Opua to the drylands forest project. The villages of Lai Opua are a planned residential development on land owned by the Department of Hawaiian Homelands (DHHL). Charged with providing homesteads for native Hawaiians, DHHL is building modern home sites in an area that contains both remnant native dryland habitat and extensive archaeological remains of traditional Hawaiian home sites. This juxtaposition provides an opportunity for the new community of residents to reconnect with their natural resources and cultural history. The outreach coordinator for Lai Opua Preserve, Keoki Carter, has developed a program called Mea Lau that teaches community members traditional uses and construction techniques for common native plant materials

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On opposite page, from left to right:
A rare, mature native uhiuhi (Caesalpina kavalensis) tree.
Seeds of the uhiuhi tree.
Photos courtesy of Travis Idol.

At left, from top to bottom:
15-year-old stand of Mindinao or rainbow gum (Eucalyptus deglupta) trees with dense stand of guinea grass (Megathyrsus maximus) after thinning.
New shoot of native lama (Diospyros sandwicensis) tree.
10-year-old native tallowwood (Eucalyptus microcorys) tree.
Photos by J.B. Friday.

> ***"Due to the dry conditions and continuing threat of invasive species, natural regeneration is sporadic and periodic maintenance will always be required."***

At right, tip up mound. Photo courtesy of Dr. Ann Camp.

Thomas Wyse
A Forest Guild member since 2008, Thomas is the forester for the Kickapoo Woods Cooperative based in Viroqua, WI. He is also a Certified Plan Writer and an NRCS forestry Technical Service Provider.

Using Uncommon Practices that are Good Forestry in the Upper Midwest

by Thomas Wyse

The sustainable forestry practices described below are not truly innovative. I'd say a better description is simply uncommon forestry practices that are good forestry but may require some explanation for landowners and loggers. These practices and and their implementation are based on my experiences working as a forester in northern Wisconsin and the Driftless Regions of Wisconsin and Iowa (driftless refers to the area not covered by glaciers during the last ice age). The forests are a mix of Northern hardwood stands and oak-hickory stands.

Group selection

I have had good results from a combination of group selection with stand-wide thinning. This combination helps create vertical and horizontal heterogeneity and increases forb and shrub density. Shade-intolerant, non-maple species are more likely to regenerate in group openings than in forests managed with single tree selection. Group selection also allows the landowner to responsibly profit from some of the valuable mature trees. A stand that would be commercially marginal if marked as a single tree selection can be economically viable if marked as a group selection with stand-wide thinning.

Group selection isn't widely used in my region and it can be a challenge to get the feel for marking openings if you're used to marking single tree selection harvests. Some of the openings can seem large when just looking at the trees marked, but they look smaller after they've been cut. Landowners are also hesitant to try it because it will leave gaps in the forest that they didn't expect to have as a part of their post-harvest forest.

In order to facilitate regeneration, the openings should be at least average stand height in diameter (up to twice the stand height) and most of the trees and old suppressed saplings down to two inches in diameter should be cut. Stand conditions should dictate where to place the openings, but it is important to ensure there are enough gaps to establish a new cohort. When group openings contain vigorous saplings, I like to try to leave those. To force myself to make enough gaps, I put in a certain number of openings per can of paint, or place them on a grid. I like to map the locations of the openings so I can see how the gaps are spread out through the stand. Sometimes I mark the openings first, then mark between the openings. I recommend leaving a mature tree or two in some openings, especially larger ones.

Clearcut rather than high grade

Moving from high grading to clearcuting can improve stands cut by loggers without a forester involved. If a good forester is involved, a forest won't be highgraded. A clearcut with clumped and scattered reserves is more likely to produce a forest that is more vigorous and desirable in the long term from economic and ecological perspectives than a high grade that takes out the best trees and leaves the rest.

The challenge is that landowners want to feel like they still have mature forest after a harvest, and high grade delivers on this. It may not be a desirable or valuable forest, but there are still trees there. In places where there is no pulp market for the smaller-diameter wood, a clearcut can be more expensive than a high grade to implement since more low- or no-value trees need to be cut. Landowners can be reluctant to take a lower bid to have the non-merchantable wood cut or pay someone to clean up after the harvest. However, many states and the federal government offer cost sharing for post-harvest timber stand improvement work. I have set up sales as

commercial clearcuts if the landowner agrees to hire the logger or another contractor to cut and leave the noncommercial trees; so the final result is a true clearcut with reserves.

Though some landowners like the trees left standing after a high grade, many loggers would rather clearcut a parcel than high grade it. A clearcut makes it easier for them to work, and if there is a pulp market in the region, they are happy to get more wood. Giving the loggers some talking points on the benefits of a clearcut and the disadvantages of a high grade to discuss with landowners may help reduce the number of stands with poor growing stock in the future. At the same time, it is important to encourage loggers to leave clumps uncut and try to connect those areas for wildlife habitat and biodiversity.

Leave legacies, brush piles, and uproot stumps

Snags, coarse woody debris, brush piles, and tip up mounds all provide habitat and microclimates that are lacking in many of our contemporary forests. Having a logger leave or create these features takes time and potentially lower bids, so it requires some discussion with both landowners and loggers to make these legacies part of the future stand.

Loggers aren't shy about telling the landowners that trees the forester marked to leave are going to die and fall down and that they'd be happy to cut those trees too. Therefore, it's crucial to make sure the landowner is on board if you're marking trees to leave for snags. Some landowners are eager to make snags if they don't exist. It's a relatively accessible task for most landowners, and they can quickly see results. If the landowner doesn't want to create the snags, the logger can. It's especially easy for them if they are using a processor to skin the bark off with the processor head.

I mark trees to become snags when I am marking timber, but loggers can select the trees to be left on their own, especially in relatively uniform stands. With a little guidance, it is easy for them to leave a mature tree every so many feet to be girdled or left to live its life. If there are many snags in the stand that the logger wants to take, the instructions can be similar: leave the largest snag every so many feet. Likewise, I usually describe how many and what size brush piles I'd like left when the sale is complete; then leave it up to the logger to determine how and where to place them. I've seen some dandy brush piles built this way.

Pushing trees or stumps to make tip up mounds is the practice I've had the most push back from loggers on. A conversation up front about safety and feasibility can get loggers on board. If the logger is still resistant, all those snags and future snags left to "just tip over and rot" (as I've heard a logger say with a snarl) may create the tip ups anyway. As with snags, bigger is better for tip ups, but stand logging equipment can only do so much.

Above, a round opening in a red pine stand in Wisconsin. Photo courtesy of Julian Hutchison.

Plant at lower densities

I have found planting trees at lower densities keeps light on the ground longer, so ground layer is more diverse for a longer period of time. In addition, planting and maintenance costs are lower, especially if the landowner has to control deer browse; and if the plantings fail, there is less money invested in the project. However, low-density plantings are uncommon in my region because it's not the way trees are traditionally planted. State tree planting recommendations and cost sharing requirements typically encourage higher density planting; but if timber production isn't the landowner's primary goal, then there is little reason to plant 900 trees per acre.

The landowner's goals for tree planting should determine the density. If pre-commercial thinning and small-diameter thinning are not really viable in the plantation, then a high-density planting could be counterproductive. In some cases, the landowner just wants to feel good about planting some trees in an old field. In that situation, I steer them toward lower-density planting.

While I have seen good results from implementing these practices, they can take a bit of work up front to get the landowner and loggers on board. In combination, they can add diversity and important habitat to our forests. Hopefully, they can become part of the standard forestry repertoire in the region. ■

> ***"Some landowners are eager to make snags if they don't exist. It's a relatively accessible task for most landowners, and they can quickly see results."***

Loblolly Regeneration from page 5

MEMBERSHIP

Professional Membership in the Forest Guild is open to all forest professionals whose work is directly related to the stewardship and protection of forests, whether that work occurs through on-the-ground management, policy, advocacy, or research.

Other individuals who share a concern for forests and forestry are invited to participate as **Supporting** or **Sustaining Members**.

Students are also encouraged to join and become involved.

JOIN TODAY
www.forestguild.org

Photo above by Greg Owens.

At right, deciduous species 'windrows' left within a matrix of seven-year-old loblolly pine. Photo by Alex Finkral

environmental, scenic, rural, woodland and wetland characteristics…, and diversity of plant/animal species and their natural habitats."

Conservation and Production Goals

Balancing timber production with conservation goals is at least as much art as science; at TFG's Eastern Shore forest, managing that balance is left to consulting forester Larry Walton of Vision Forestry. Walton has a wide range of experiences as a forester in the southeastern U.S. Under Walton's management, the growth and development of TFG's Eastern Shore forest is following new and interesting pathways that capitalize on appropriate uses for every acre.

For example, Walton prescribed a five-acre patch cut in one stand to promote growing space and habitat for rare and endangered species. That patch, a sparsely forested sand hill surrounded by a young, productive loblolly stand, now supports what are the best known populations of the state-threatened wild lupine (*Lupinus perennis*) and the state-endangered butterfly frosted elfin (*Callophrys irus*), along with significant populations of other rare, threatened, or endangered plant species.

Silvicultural Practices

TFG's natural regeneration of superior loblolly seed stock is the first attempt to do so on the Eastern Shore. It is an approach that is starkly different from what is generally practiced across the Southeast: finely tuned recipes for loblolly management consisting of clearcutting, site preparation, and planting. In regenerating loblolly pine naturally, there are three possible outcomes: too many seedlings establish, too few, or just the right amount. Because the third of these possibilities is the least common, managers are usually faced with pre-commercial thinning in dense stands or supplemental planting in sparse stands. In the Eastern Shore forest, pre-commercial thinning is indeed conducted in vigorous cohorts to accelerate stand growth; however, planting is not common. In step with both TFG's culture and Walton's interests, species mixtures are not only tolerated but encouraged, which also meets with the spirit of the state of Maryland conservation easement. When pre-commercial thinning is done, often dominant, well-formed oaks will be favored along with loblolly.

Herbicides to control broadleaf vegetation and grasses are applied at levels below manufacturer's "guaranteed rates," sometimes as low as 50 percent of the recommended dosage. Walton has found the practice results in higher mortality in less desirable species such as sweet gum (*Liquidambar styraciflua*) and red maple (*Acer rubrum*), yet is not lethal to many individuals of oak (*quercus sp.*), yellow poplar (*Liriodendron tulipifera*), and black gum (*Nyssa sylvatica)* species. For example, Maryland currently offers three levels of a particular herbicide application for private forest landowners: 12, 14, and 16 ounces/acre. Walton commonly uses 6-8 ounces/acre of the same herbicide and finds that, "a good percentage of the oaks come through fine."

In one stand, Walton opted to leave the 30-year-old hardwoods that had established in windrows during the last planting instead of applying herbicide to them. The result is a stand with a matrix of young, naturally regenerated loblolly surrounding linear, mixed-species strips that add structural diversity. Beyond herbicides, no mechanical site preparation takes place in regenerating loblolly on sites where seedling bedding took place during prior ownership. As you would expect with less intensive management, loblolly rotation lengths under this system are projected to be longer, 40-45 years.

Conclusion

The types and combinations of treatments being applied to develop loblolly-dominated stands on TFG's Eastern Shore forest are novel and adaptive. The net result is a very gradual, incremental conversion from pine plantations driven by a single focus to mixed species stands, which on the Eastern Shore are a return to a forest type that existed prior to agricultural conversion over 150 years ago. ■

Oak Habitat Conservation from page 7

fine scale that they are not easily distinguished on a map. Conditions can change every 100' so rather than attempting to break each patch out, it is better to consider prescription options for the entire stand and then treat each small area appropriately. Within the areas of dense young conifer, the prescription is to pre-commercially thin to 15' spacing. Favor Doug-fir and Ponderosa pine over cedar. Retain stems showing the best growth and the largest live crowns. Where any oaks or large madrones are present, all conifers <15" dbh should be cut from the dripline. Regardless of density of stems, all firs and cedar <3" dbh should be cut. This stand currently has some volume in these conifer dominated areas. Most fir and cedar are growing quite well, showing a 2' growth leader each year. Where oak release is not necessary, this stand should be allowed to grow into commercial size (>12" dbh) before a more aggressive series of commercial thinnings could take place to reduce the trees per acre down to 50-60, retaining all oaks. These areas will eventually be a mature Mixed Oak Conifer forest type. In the meantime, it should be treated as a commercial conifer forest. Post initial treatment will be 220-250 trees per acre and 70 percent canopy. Post final commercial thinning should be 50-60 large open grown conifers and hardwoods per acre with 50 percent canopy.

The rest of stand 7B is more open and with less conifers and often larger oaks. These areas will be treated as Oak Woodland, with interspersed small meadows about one acre in size. All fir and cedar <15" dbh should be removed. Retain pine when they are found. All oak species >10" dbh should be retained unless they are within the dripline of a significantly larger oak. Madrones > 15" dbh should also be retained; any smaller should be cut.

Much of these more open areas have high amounts of invasive brush, primarily hawthorn but also blackberry and scots broom. These should be treated either mechanically or with appropriate herbicide use. Retreatment will be necessary. This could be done in the future with prescribed fire in these areas. Post treatment for this stand should maintain approximately 30-60 large trees per acre with a canopy cover of 30-60 percent.This area is frequently grazed, the herbaceous layer is primarily a mix of common non-native grasses. Opening up the ground through thinning and brush removal will increase the amount of light available for grass production, and invasive weed production. Post treatment seeding should be done on all disturbed soils to decrease chances of unwanted vegetation.

The Oak Habitat Restoration Project is designed to treat 2,000 acres during the next few years. Once completed, the direct habitat improvements will be easily identifiable. In addition to the ecological benefits, most of the treatments are very labor intensive, resulting in additions jobs within regions and industries which have had little to be cheerful about recently. In most cases, I am attempting to write prescriptions that provide for possible economic return, through both timber and non-timber harvest. Most of these areas are relatively flat and have an existing road system in place which will allow for easy access, especially during the dry months. Some stands will need to have significant volumes of both hardwood and conifer removed to achieve the desired future condition. All harvests are designed as a by-product of the planned oak restoration. ■

Above, oak with conifer encroachment. Photo by Jake Robinson.

MISSION

The Forest Guild promotes ecologically, economically, and socially responsible forestry as a means of sustaining the integrity of forest ecosystems and the welfare of human communities dependent upon them. The Guild provides training, policy analysis, and research to foster excellence in stewardship, to support practicing foresters and allied professionals, and to engage a broader community in the challenges of forest conservation and management.

Photo above by Vicky Estrada-Bustillo.

Forest Partnership, from page 3

relationships, and there is inertia in the way the industry has historically worked around those relationships. With the global economy in flux, there has never been a time when businesses have been so open to trying new things.

It is the hope of the Forest Partnership that as more projects emerge, more people will be open to giving this model a try. In order for the local economy to survive, there must be tighter links between wood users and wood suppliers through the entire supply chain.

One opportunity for expanding the Forest Partnership model is in the emerging market for community-scale biomass heating projects. There is growing interest on the part of wood users such as schools to find local, sustainable supplies that are easily explained to constituents, whether students, graduates, or their own faculty.

One component of that assurance of sustainable management under the FSC certificate is the Forest Partnership's endorsement of the Forest Guild's guidelines on biomass harvesting and retention for Northeast forest types. The Forest Partnership is working with several institutions to help them secure a consistent supply that meets their needs. Simultaneously, the Forest Guild continues to work with its partners to help community-scale wood users to develop consistent, realistic standards that can be integrated into the supply chain. Without certification standards, there would be no way to differentiate between various sources of wood that arrive at a mill. Currently, the market lacks a mechanism for recognizing someone who is doing a beautiful job managing their woodlot. That person's wood might end up on the shelf next to the product of an illegally logged, irrecoverably-damaged parcel from another country. Our profession needs to give the public tools so that they use their money wisely to support sustainable forest practices. In New England, there is a lot of great management going on, and the public would be wise to pay for the true value of this resource.

The Forest Partnership is working to bring recognition of sustainable forestry through the supply chain to consumers. In the next decade, we would like to see more locally grown, certified wood being used and promoted by local manufacturers. More of the forest landscape could be utilized to provide wood to local industries. Better forest management practices could become the norm, and landowners could receive a lot more satisfaction knowing that their wood is being used in their community to support good jobs instead of disappearing on the back of a log truck. For more information, please contact Ben at Redstart Forestry and Consulting (802.439.5252).■

"In New England there is a lot of great [forest] management going on, and the public would be wise to pay for the true value of this resource."

At right, forwarder loading white pine logs. Photo courtesy of Long View Forest.

Aloha from page 9

found in the dry forests. One goal of these efforts is to restore these dry forestlands sufficiently to allow harvesting of plant materials for traditional uses, strengthening the bond between the health of native ecosystems and native communities.

Ookala Community Forest

Another restoration project on Hawaii Island in a very different bioclimatic setting is the Ookala Community Forest. Situated on state lands in the deep soils and high rainfall of Hawaii's northern Hamakua coast, this project started out in the mid-1990s as a test site to evaluate a variety of tropical hardwood species for use in plantations. These include high-value hardwoods like mahogany (*Swietenia macrophylla*), Spanish cedar (*Cedreal odorata*), narra (*Pterocarpus indicus*), and pheasantwood (*Senna siamea*); and fast-growing timber trees like Mindinao or rainbow gum (*Eucalyptus deglupta*), blue marble (*Elaeocarpus angustifolius*), and brush box (*Lophostemon confertus*). In 2000, a local community group, the Laupahoehoe Train Museum, was asked to take over management and enhancement of the site. Project manager Lisa Barton has been in charge ever since. At first, activities involved primarily mowing and weeding in and around the tree plantings. But as community members and especially local students were invited to participate in the expansion of the tree plantings, it became clear there were other important values for restoration on this site.

There was great interest in planting native species and "canoe plants", species brought by the colonizing Polynesians that were vital for their survival ways of life, such milo (*Thespesia pulunea*), kamani (*Calophyllum inophyllum*), kou (*Cordia subcordata*), and others. While the timber trees are intended to provide a revenue stream to help manage the site, the native and canoe plant species will provide cultural resources for the community, including wood for traditional tools and implements; and leaves, flowers, and seeds used for ceremonial dress as well as medicine, dyes, and other purposes.

The initial timber plantings and restored lowland forest species have attracted interest from outside community and student groups. Forestry classes

At left, volunteers remove weeds by hand in thinned tallowwood stand. Photo by Travis Idol.

from several University of Hawaii campuses and even from Japan have visited the site to train in forest inventory and measurement and silvicultural practices, such as mixed-species plantings and experimental thinning. For example, thinning in a tallowwood (*Eucalyptus microcorys*) stand from 500-300 trees per acre reduced basal area by 50 percent. However, growth of the remaining trees led to complete recovery of basal area within four years and additional self-thinning to 200 trees per acre. This collaboration provides not only long-term data but also lessons in the multiple values embodied in community forest projects. Forestry professionals and students better understand the importance of forests for the community. Community members, in turn, appreciate the contributions that professional foresters can make to enhance the natural resources and life of the community.

Hawaii represents a crossroads of East and West, but it also celebrates the rich host culture of the native Hawaiians as part of its appeal for tourists and scholars. Unique in many ways, it serves as a microcosm of challenges and opportunities for sustainable development and resource management found throughout the world. The variety of community-based forest projects highlighted in this article offers a sampling of how this combination of host culture and immigrant communities continues to shape the natural resources and cultural life of the islands. Hopefully, they can serve as a model for other places struggling to reconnect. ■

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At right, Kapulehu restored native dryland forest, Hawaii Island, Hawaii. Photo by J.B. Friday.