

# YFF Review



## Wood as an Environmental Resource



A summary of a forum and workshop exploring the sustainable use of wood as an environmentally responsible choice



A Yale Forest Forum Event

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Global Institute of  
Sustainable Forestry

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The *YFF Review* joins the GISF Website as an outreach tool to improve the accessibility of information on issues relating to forestland use and conservation. The purpose of the Review is to inform stakeholders about programs and activities sponsored by GISF. We hope that you will find the information in each *YFF Review* useful and stimulating. For more information visit our website at [www.yale.edu/gisf](http://www.yale.edu/gisf).



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## Executive Summary



The world has reached an interesting threshold biologically, economically, and socially, noted Dr. Chad Oliver, Pinchot Professor of Forestry and Environmental Studies, in his opening remarks at the Yale Forest Forum “Wood as an Environmental Resource.” Parts of the world differ greatly in their levels of economic well-being, development, and resource consumption. These characteristics are changing quickly and we are now at a point where our policy decisions and market choices will have enormous consequences for forests in the future.

Wood products markets in the United States are increasingly pressured by cheap timber and milling abroad, which reduces the value of forestland in the United States. For these and other reasons, small landowners find it difficult to earn much financial return from their land, thus increasing the odds that they will succumb to selling for development.

The forum provided an opportunity for a panel of forest researchers, landowners, and lobbyists to discuss the challenges and opportunities of working in the wood products industry. The panel members shared their experiences with the general public in a panel discussion and also participated in a workshop with other scientists, landowners, and representatives of non-profit organizations to discuss strategies for improving the wood products market in the United States.

The panelists were: Chris Risbrudt, Director of the Forest Products Laboratory at the USDA Forest Service; John W. Burke III, Attorney at Law at McGuire Woods LLP and owner/manager of Burke Woodlands; Bruce Lippke, President of the Consortium for Research on Renewable Industrial Materials (CORRIM) and Director of the Rural Technology Initiative, College of Forest Resources, at the University of Washington; Gerald Gray, Vice President of the Forest Policy Center at American Forests, a national citizens’ conservation organization; and Randle Phillips, Executive Director of the Programs and Legislation Office at the USDA Forest Service.

Chris Risbrudt addressed a range of new processing technologies which may allow the wood products market to expand in unprecedented directions. The Forest Products Laboratory is the only national laboratory of the U.S. Forest Service engaged in researching wood products technology. From playground surfacing to bark filters, biodiesel to nanotechnology, innovative products will likely be more economically viable in the long-term than traditional wood products such as 2x4s. Small diameter trees are currently one of the least marketable types of wood, but Risbrudt sees great potential in a market for woody biomass, which is an abundant source of energy. The development of these ideas and others may help to offset the decrease in the forest economy due to the importation of timber from abroad.

John Burke spoke about the wood products industry from the perspective of a family forest owner. Burke Woodlands is a family-owned working forest in Virginia, comprised of about 3000 acres. For Burke, one of the most important strategies in revitalizing the forest industry will be embracing and understanding small family forest owners, who own 42% of the land in the conterminous United States, and provide important ecosystem services to millions of people. While industrial forests and public lands typically receive more attention, small forest owners face a unique set of problems including weather patterns and natural disasters, market challenges, and overwhelming tax burdens. At the same time, landowners are motivated by a diverse array of values. Understanding the motivations and challenges of this sector will help to make it more sustainable.

Bruce Lippke focused on quantifying the carbon and environmental services associated with wood in his discussion comparing the environmental performance of wood products and other substitutes. His work with CORRIM includes developing a cradle-to-grave analysis of wood and its associated carbon balances, using modeling to examine how stand rotation lengths and treatment strategies may impact carbon storage, and how wood products used in different climates and situations

may result in different levels of emissions and inputs. The study also includes an economic analysis of wood products, incorporating society's willingness to pay for ecosystem services such as carbon sequestration. Lippke's eventual goal is to get new technology into the hands of small landowners.

Gerald Gray detailed the importance of developing strong national policy to support new developments in the wood products industry, and of partnering with other organizations with similar goals. An integrated approach will be critical to this endeavor, according to Gray; organizations must recognize the link between the health of forests and the health of communities that work in them. Incentive structures and compensation for environmental services may be an important way to increase the economic health of natural-resource based communities and improve the economic viability of small forest ownership. Gray pointed to the 2006 Farm Bill as a critical opportunity for bringing the concerns of forest landowners to the forefront of the agenda in Washington.

Randle Phillips, an advisor to congress, believes that entrepreneurship will be one of the most important tools for small landowners and rural communities. Many rural areas lack funds and infrastructure, however, and national policies can be instrumental in helping new initiatives take hold. Phillips pointed to revolving loan funds, public/private partnerships, and innovative policies such as the 1994 Healthy Forest Restoration Act as steps in the right direction.

In the subsequent workshop, panel members and other representatives of the forest sector continued discussing the economic and environmental issues in the wood products market. Much of the dialogue focused on changing economic and political structures to make wood products more competitive in a broad, global market. Participants also highlighted the need to increase public awareness and improve perceptions of wood products and forest management.

## Issue Introduction

Many countries are increasing both their consumption and production of wood products. If used appropriately, wood can be an environmentally valuable resource—especially to help pay for forest management and to reduce the consumption of fossil fuels and emissions of carbon to the atmosphere. At present, however, it is increasingly difficult for landowners in the United States, and elsewhere, to make enough money from selling wood to keep their forest. Many forests in the United States are owned by individuals and families who sell their wood on the open market. With low wood prices and major competition from substitutes such as steel and concrete, as well as wood processed abroad, the American forestry sector is searching for ways to maintain its infrastructure of roads, skilled workers, processing facilities, markets for wood, and even the forests themselves.

Forest certification programs call attention to sustainably managed forests and to the benefits of maintaining land in forest cover. At the same time, new technologies in product development reduce the costs and increase the efficiency of processing wood—thus making wood a more desirable product than many substitutes in construction, energy, and other business sectors. Improving the image of the forest sector and of wood products may be best accomplished by promoting the environmental benefits of wood and forestry.

Wood products can be more environmentally sound than substitutes, from the production stages through use and disposal. Compared with common alternatives such as steel and concrete, wood products generally use less energy in processing and harvesting, produce less waste, and result in a higher quality product. Non-renewable energy sources can be replaced by new technologies such as biogas generators that make use of wood biomass, thereby reducing dependence on fossil fuel energy sources, and improving the health of dense, overly stocked forests. Using local wood can reduce shipping costs as well as energy and emissions associated with transportation.

The United States remains the largest producer and consumer of wood products in the world. After recovery from large clearing of forests for timber and agriculture in the 19<sup>th</sup> and early 20<sup>th</sup> centuries, the amount

of forest land in the United States has increased and much of the original forest area is again under forest cover. Despite these changes, traditional products like saw timber and paper pulp can now be produced, processed, and shipped less expensively overseas than domestically. Unlike the United States, much of the world uses very little wood in their buildings. Instead, they build out of steel, concrete, and brick, which consume much more fossil fuel and add much more carbon to the atmosphere. In addition, 55% of the world's wood consumption is for firewood—an environmentally inefficient use of wood compared to using it for construction. If cheap, efficient alternatives for cooking and fuel were put into widespread use, then more wood would be available for construction in developing countries. Even in the United States, many wood products are now being replaced by inexpensive substitutes such as concrete, steel, and plastic. Political lobbies for these alternative products tend to be strong and powerful, resulting in benefits for these industries in the forms of subsidies, incentives, and tax credits.

Wood may struggle to compete economically with other products even if economic structures become more balanced, but the environmental benefits of wood products are substantial either way. Past unsightly and irresponsible logging has given the sector a bad reputation in the conservation movement; some environmentalists feel that all harvesting is harmful to wildlife, water quality, and soils. These views overlook the ecological returns from working forests, including land conservation and ecosystem services such as carbon sequestration, water filtration, and habitat protection. Harvesting can be done safely and sustainably; and while some forest practices may be harmful, forest certification programs can help to distinguish well-managed forests from those managed improperly. Such certification efforts are helping to remove the stigma against forestry in the conservation community and should boost the popularity of wood products.

Forest management is important to ensure that forests complement human goals and needs. If forests are managed appropriately, the world could sustain its forests while at the same time increase timber harvest, protect other environmental values, and provide protected

areas such as National Parks. Management can reduce the amount of biomass in forests, moderate the damage caused by wildfires and the potential of insect infestations, and restore unhealthy stands. Harvesting can also be used to create viewsheds, manage aesthetics, create a diversity of habitats, and safeguard roads and buildings. Most importantly for landowners, timber harvest is a way to finance forest ownership and these conservation efforts. At present, the private forest owner that provides the non-wood benefits rarely receives financial compensation for the effort. These landowners rely on sales from timber harvesting to help pay for conservation activities, make tax payments, purchase more forest land, or simply hold off the pressures of development.

Significant political, technological, and cultural challenges lie ahead as the forest sector seeks to increase funding for forest conservation, develop new technologies, and educate the public about sustainable forestry and the environmental value of forest products. Changes will need to occur at all levels of society—from consumer attitudes and grassroots efforts to major shifts in national policy. Wood products can become more environmentally sustainable through certifications and payments for ecosystem services, but these strategies may also increase the cost of wood. Consumers must be shown the value of wood if we are to see an increase in their willingness to pay. Likewise, environmental groups must embrace sustainable forestry as an ally if forest conservation is to compete with development pressures.

Many major policies, such as subsidies for research funding, favor industries like agriculture, oil and gas, or steel. By doing so, these policies place the forest sector at an economic and cultural disadvantage. Legislation that equalizes or boosts forest products relative to other industries would help to increase the economic viability of the industry, allowing landowners to consider more environmental issues in management in addition to economic concerns. Partnerships with other sectors and interests will be necessary to bring about those legislative changes. While cooperation is rare on the national political scene, there are promising examples of collaboration among forestry groups leading to increased political power and progress for the forestry sector.

## Presenter Summaries

### RANDY PHILLIPS

Executive Director, Forest Counties Payments Committee, Advisory Committee to Congress

Federal and local policies related to the integration and utilization of management in forests, and use of the forest products, can take three forms. Policies can stimulate these industries or act as incentives, they can be disincentives, or they can be neutral. Most of today's policies seem to fall into the neutral category; there are not a lot of incentives and not a lot of disincentives.

There are several bright spots, however. The Healthy Forest Restoration Act made an attempt to recognize the connections between management and utilization in several policies, which was a very positive step for legislation. The Forest Service now has a stewardship contract and the authority to take steps forward. The authority and funding provided by such Forest Service programs, though, is on a small scale compared with the expenditures of major federal programs.

Despite these examples of innovative policies, the current policy paradigm is still defined by the Farm Bill and the Rural Development Act of 1972. These policies need to shift from one of subsidies, which hold back business innovation in a lot of rural communities, to investments in new engines of growth. The nation now spends huge sums on agricultural subsidies that produce the same commodities year after year, when value-added products and specialty niche markets hold the most promise. Policies that provide better linkages between management of public lands and private forests and the production of these desirable products are not only necessary, but can have significant economic benefits to many of the rural communities that are geographically positioned to take advantage of them.

Our ability to manage forests in a sustainable way and to use products in an environmentally responsible way is determined by three things: technology and education, access to capital, and regional clustering of



**“Policies need to shift from a focus on subsidies, which hold back business innovation in a lot of rural communities, to investments in new engines of growth.”**

—Randy Phillips



industries. Globalization of markets over the last ten to fifteen years has caused many rural communities to lose any competitive advantage, which was really defined by inexpensive land and cheap labor. Regaining and maintaining some level of competition will require innovation, gained through research and improved technology. Small entrepreneurial businesses account for about half of all innovations and 57% of all inventions. Most entrepreneurial companies are founded with less than \$50,000 but investment capital is limited in many of these rural areas. Distances between firms can be great and there are few entrepreneurs. Federal policies that provide capitalization to revolving loan funds are probably one of the most effective ways to provide financial assistance to private enterprises.

National and local policies should foster the creation of regions with common natural and human resources. Evidence suggests that regions that form clusters of businesses are more likely to be successful than regions with isolated, unconnected industries. Clusters allow entrepreneurs to share information and assessments of markets and technologies and, most importantly, to learn from one another. From a policy perspective, economic development funds could be made to regions that have formed these clusters and reward such efforts. While past approaches frequently attempted to embed pieces or objectives within larger legislative initiatives, stand-alone pieces of legislation can have an important role in bringing focus to changing objectives and to creating new objectives in these areas.

**CHRIS RISBRUDT**

Director, Forest Products Laboratory, USDA Forest Service

The U.S. harvests 300 million tons of wood every year, and wood is the second most important industrial commodity in the country. At the same time, we grow about 700 million tons each year, and many of our nation's forests have become choked with excess small diameter wood. The problem results from policies that prevent fire and from a lack of markets for small diameter wood. Today, many forests are unhealthy and increasingly susceptible to major wildfires and insect infestations that threaten human property and safety.

Research on wood products places very little emphasis on traditional products like 2x4s and dimensional lumber. To the extent that research does address construction material, it stresses ways of taking wood apart and putting it back together, like wood trusses, finger joining, veneer lumber, and laminating. The bulk of current research addresses unconventional products and uses of wood, which may help to create markets for the woody biomass that causes problems in overstocked stands. The forest products sector research agenda is called "Agenda 2020: Focus for the Future." Goals include creating a technologically advanced workforce, developing breakthrough manufacturing technologies, advancing the wood products revolution, and increasing the efficiency of recycling wood.

One of the research areas addressed by the USDA's Forest Products Laboratory is composites. Wood chips are the most popular playground surfacing material because they are cheap, effective, and safe, but the Americans with Disabilities Act requires that half of all playground equipment be accessible by wheelchairs. The Forest Products Laboratory has been developing binders to hold chips together and create a surface that is hard enough for wheel chairs and soft enough to cushion falls. Including the binder, this type of surfacing is still only a third as expensive as the next best alternative. Roofing shingles can also be composites,



**“While humans have used wood for hundreds of thousands of years, it's still a pretty novel material. We're still learning about its properties and ways to better our own lives with its use.”**

— Chris Risbrudt

made from wood fiber and recycled milk jugs. The shingles can be made to look like wood or asphalt shingles, and they have been shown to keep attics 20-30° F cooler than asphalt shingles.

Another important research area is in water filters. In water, bark has a strong affinity for both positive and negative ions, and most pollutants. Early prototypes are filtering heavy metals from abandoned mine runoff, petroleum in parking lot runoff, pesticides in Massachusetts and Wisconsin cranberry bogs, and fertilizers and phosphates from New York City watershed supplies. Filters can be reused in different places with different pollutants. A filter loaded with metal ions from acid mine drainage can be reused to remove phosphates in another location. When it is filled with phosphates, it may be used again for metal ions.

While these new technologies have great potential for expanding wood markets, they will not solve the problem of the excess biomass in forests. Wood use may increase in the United States by 1% per year, but fires meanwhile are getting larger, more intensive, and more expensive. The Forest Products Laboratory is currently working with the National Renewable Energy Laboratory in Colorado to develop innovative products from small diameter biomass. Such products can help to reduce hazardous fuels in forests across the country as well as reduce our dependence on non-renewable energy.

One solution is to turn biomass into chemicals; a wood-fired generator which gasifies wood, produces enough energy to power approximately three houses. Economically the process is marginal, but using heat generated by the unit could make it more viable. Processing units may also be mobile enough to bring into forests, which would reduce transportation costs; power could then be sent to the grid directly from the forest. Another new development involves the use of a ceramic membrane that produces a high-energy gas, which can be condensed into 25 gallons of diesel fuel per ton of dry wood. The best pulp and paper mills in the world are now in China, where production costs are

low compared to those of domestic mills. Old pulp mills in the United States are quickly becoming obsolete, but they may see new lives as bio-refineries, creating ethanol and diesel fuel from a 50-year-old industrial process.

Nanotechnology is another promising field; trees produce nano-cellulose (tubes) in cell walls that are only 6 nanometers thick. The automotive sector plans to use thousands of pounds of carbon fibers in car parts within five years because the fibers are strong, light, and resistant to damage. While such fibers are currently expensive, pulp and paper plants may be able to produce substitutes quickly and efficiently. Nanoparticles in milk cartons could change color if the milk starts to sour; particles in cardboard shipping boxes could indicate a problem if the box became too hot, too cold, or otherwise tampered with; and coatings could detect anthrax in paper or termites in a wall.

While many of these ideas have yet to be tested and may prove to be unsuitable, we are at a critical juncture in forest product development. With many manufacturing processes moving overseas, the forest economy in the United States is struggling. The choice is upon us. We can allow production and supply chains to migrate offshore, or we can introduce new lines of products to promote significant growth. New technologies can increase revenues while protecting core products, improve the health of our forests, and increase the nation's energy self-sufficiency.



**“Heating and cooling produce almost ten times the emissions that come from the construction of a house itself.”**

— Bruce Lippke

#### **BRUCE LIPPKE**

President, CORRIM

Director, Rural Technology Initiative, University of Washington

The Consortium for Research on Renewable Industrial Materials (CORRIM) aims to develop a public database with models of environmental performance measures over the life cycles of wood products. This database can be used to identify environmentally preferable products and management strategies.

While any number of variables can be used to track environmental performance, CORRIM frequently uses carbon as a key indicator. The lifecycle starts at material extraction, includes product processing, construction, and maintenance over the product’s useful life, and ends with demolition and disposal. For example, a comparison of different processing methods for wood shows that the energy used in producing green lumber is small, while kiln-dried lumber uses a large amount of processing energy. Composite products require even more energy and steel requires three or four times as much energy as kiln-dried lumber for the equivalent amount of product.

In order to realistically manage the assessment of so much data, the organization relies upon a select few measures of risk that can be related to human or environmental health. To analyze these risk measures, researchers selected two sites for use in designing virtual houses—a cold site in Minneapolis and a warm site in Atlanta. The Minneapolis houses had full basements and were framed with steel or wood. The Atlanta houses were framed with concrete or wood, placed upon a concrete slab. After analyzing thousands of variables, CORRIM estimated that the embodied energy for the steel-framed house in Minneapolis was 17% greater than that for the wood house and water pollution was 300% greater. The steel house also had greater air emissions and greenhouse gases, but it produced a slightly lower amount of solid waste. The differences between the houses may seem slight, but only about 6% of the materials (by mass) changed between the two house

models. When the researchers focused only on the materials that changed (floor and walls, primarily), there was as much as a four-fold difference between steel and wood framing in terms of emissions and environmental impacts.

The processes of heating, cooling, and maintaining homes produce almost ten times the amount of emissions that come from products and construction, and analyses of long-term costs need to account for present value calculations of these emissions costs. While the long-term carbon emissions are huge for all types of houses, they can be offset for wood homes by carbon sequestered in the standing forests that are managed to produce the components of the house. The Minneapolis wood house showed net negative emissions over the life of the house when sequestration was considered. The Atlanta house was not negative because timber is on shorter rotations in the south, but the emissions balance was still significantly lower than that of concrete-framed houses or the steel house in Minneapolis.

While cradle-to-grave analyses are important, another part of CORRIM’s work involves the use of a landscape management system to simulate how forests are managed. This system can determine how rotation lengths and thinning treatments affect carbon storage; in general, research shows that shorter rotations store less carbon in the forest, but that measure does not take into account products, which are long-lived and do not decompose as quickly as wood in a forest. The consideration of products also includes an examination of substitutes that might be used if wood products had not been created; such substitutes are usually energy-intensive. Once carbon pool accounting procedures consider substitution as well as the useful life of products it is clear that carbon storage increases over time.

Carbon accumulation over intervals is not steady but it is predictable. In the first 45 years the rotation length doesn’t matter much because products are typically not removed from forests. After 80 years, the greatest amount of carbon storage is produced by shorter rotations that

are also optimal economic rotations. This suggests that more intensive management is a better long-term strategy. Waiting an extra ten years comes at a huge economic cost, but provides very little gain in carbon storage. But more intensive management (fertilization and thinning) on short rotations comes at almost no cost to a landowner, since there is an economic incentive to harvesting a stand with more volume on short rotations.

While CORRIM can easily compare wood with steel, concrete, or other products, it is harder to directly compare the impact of renewable and non-renewable products on the land. In order to determine the impact that managed forests have on the landscape, CORRIM simulated the impact of treatment strategies on forest structure, diversity, and habitat using a base case, an alternative with intensive management, and one with longer rotations. The evaluation considered various objectives such as increasing the number of late-seral acres and decreasing overstocked stands. Researchers found that long rotations can accomplish these objectives, but at a high cost and with less benefit in terms of carbon storage. The intensive management alternative improved forest structure for habitat and reduced overly dense stands but did not change the amount of late-seral acres.

### JOHN BURKE III

Attorney at Law, McGuire Woods LLP  
Owner and Manager, Burke Woodlands

It's very easy to understand where, how, and why industry manages land—one only has to talk with one or two industrial forest managers to understand what is happening on millions of acres. However, 42% of all land in the United States is owned by family forest owners, who are harder to understand. Every individual has different motivations, goals, and values, which result in different management strategies and techniques. The land itself is also diverse—parcels come in myriad sizes and shapes with enormous differences in ecology and economic value. Understanding small family forests and encouraging sustainable forestry, therefore requires an attempt to understand the values and goals of the landowners.

There are as many different perspectives of land ownership as there are owners, but several tend to dominate. Some landowners manage for wildlife habitat or hunting. Others are more interested in recreation—fishing, hiking, horseback riding, or other activities. The commercial production perspective is perhaps the most common, which includes managing for a wide range of commercial products and for various reasons, including paying taxes and producing extra income. Some landowners are interested in preservation, attempting to preserve a forest or features of a landscape as a park. Finally, there can be inadvertent or unfocused ownership, which might occur when a forest owner dies and bequeaths land to uninterested relatives. No single landowner has only one of these perspectives and this is not an exhaustive list, but these goals and trends appear frequently in family forest ownership.

The wide variety of motivations and values in small landowners creates a unique mosaic of forest. Properties have different looks, compositions, and management schemes (or no management), such that the landscape begins to resemble a patchwork quilt. The mixed uses and composition may turn out to be a strength or a weakness of the landscape over time. Regardless of the effect on the landscape, this patchwork pattern



**“You don't have much chance of communicating with [landowners] unless you really get into their hearts, understanding what they are passionate about, and get into their heads, understanding where they are coming from.”**

— John Burke

means that organizations interested in reaching out to forest landowners cannot do so with a generic message. In order to connect with landowners and truly reach them, it is important to consider the timing, the methods of contact, and the content of the message. Before any message will be truly heard, organizations must also develop credibility and trust with landowners.

Family forest owners are faced with many challenges that are common to all forest owners as well as some that are unique to small landowners. Wind damage and ice storms are some of the most critical threats to small forests. If a hurricane or major storm hits in a region, it can topple most trees in a stand before maturity, driving prices down and making labor scarce because most landowners in the area will be undertaking salvage operations. Insect infestations can also be devastating, wiping out entire stands throughout a region. Other ecological challenges include rodents, beavers, drought, floods, and fire.

Social and economic challenges range from small-scale nuisances like theft, trespassing, and trash, to international market issues. For example, a Virginia landowner discovered hundreds, if not thousands, of tires dumped illegally on his property; the landowner was suddenly responsible for dealing with their removal. Landowners also need to worry about low prices, lack of markets, legal issues, the rural-urban interface, succession, and taxes, all of which make forest ownership difficult. The lack of good markets is one of the most critical issues when attempting to improve management. When it is not possible to market certain diameters, species, or volumes of timber, landowners' ability to manage their forests successfully and appropriately can be hindered. These kinds of challenges are real for forest owners, and they can be devastating.

Because of such challenges, and because needs and interests vary so significantly among landowners, it is important to question how best to approach landowners. Is sustainability a common denominator? And is sustainable forestry an appropriate message? Many landowners are not immediately in a position to hear a message of sustainable forestry; the challenge is to determine how best to approach them.

### GERALD GRAY

Vice President, Forest Policy Center, American Forests

While policy-making in Washington, DC has typically been mired in gridlock, some community-based practitioners around the country have found ways to get beyond the conflicts of interest groups and find solutions. One of the best strategies is to partner with other groups, especially at the national level. A network of place-based local organizations will have significantly more clout than any one organization alone.

In the northwest, American Forests has worked to build bridges between numerous practitioner groups, which are now evolving a community-based forest policy group. A coalition of even more diverse groups has formed Rural Voices for Conservation, which works to encourage balanced conservation, economic development, and solutions to ecological and social problems. The coalition looks to integrated place-based work and collaboration as primary strategies for success, along with recognizing the links between the well-being and health of forest communities and the landscape itself. The coalition has gained a strong voice in Washington and Congressional staffers now recognize the value of bringing in people with local knowledge.

A current hot issue is the utilization of woody biomass. In discussions about developing this sector, there are five components that American Forests focuses on and that must be integrated in order to find solutions: consistent supply of material; transportation; capitalization and small business assistance; and appraisal and merchantability in the forest. Many practitioners believe in small-scale enterprise as a way to build industry, but enterprise on a variety of different scales is really needed to solve the problem. Large, landscape-scale projects can serve ecological and economic purposes, addressing some issues of community protection, while small-scale enterprises are developing.



**“We can talk about the ideas and talk about policies that could help, but the funding is not going to be there unless there's some new approach to advocacy and constituency building that can move these programs in Congress.”**

— Gerald Gray

Significant political momentum will be directed toward the 2006 Farm Bill, where forestry may gain or lose sway. American Forests hopes to develop two types of solutions: private landowner incentives and corporate land divestment. Private landowner incentives are a key way of encouraging landowners to continue providing environmental services, as well as making viable economic use of their woodlands. Environmental issues will be increasingly addressed at the landscape or watershed scale and communities must become more aware of the services provided by forest owners in their midst. Some potential tools for providing incentives include grant programs, cost sharing programs, tax credits, and green payments. The State of Minnesota and the New York City Watershed Protection and Partnership Council have taken some steps in this direction, compensating landowners for treatments and activities that enhance watershed protection and water quality.

As major forest producers continue to move operations overseas and sell their lands, communities are faced with the challenge of keeping these lands forested. Innovative strategies will likely be needed to hold back development, including community ownership and community governance approaches, and private landowner incentives. The major challenges are to expand these programs to incorporate other variables like carbon, wildlife habitat, or soil structure; to include other states; and to engage the federal government in environmental service compensation approaches.

Market-based approaches may be more effective than regulation and federal subsidies may play a role in transitioning to stronger markets. Subsidies could be used to develop markets, create infrastructure, or increase trading systems to help landowners receive compensation, which would be preferable to traditional subsidies. Federal initiatives like the Forest Legacy program are important in helping communities acquire rights to major land parcels, but it will also be important to help communities manage these lands over time.

Rural development is one of the biggest issues for the practitioners working with American Forests. Small grants programs like Economic Action and Rural Community Assistance help rural development. Communities indicate that the seed money has been the basis for their growth, success, and experimentation at state and federal levels. The Forest Products Laboratory and other technology groups are critical partners for small businesses and communities as they develop new approaches to enterprise and marketing. Finally, a “green collar” or restoration work force would help to provide important job skills, improve forest health and the quality of the ecosystems, and educate a younger generation. Oregon has an ecosystem work force program in place; the expansion of such programs would help to employ a wide range of people, from former foresters to unskilled youth.

Finally, many good policies have been developed and signed into law over the past few years, including some that advocate for local collaboration, community assistance, monitoring and accountability, and small grants programs. The Community Welfare Protection Plans and the Healthy Forest Restoration Act allow for integrated landscape scale planning at a local level. Many of these policies though, including traditional ones such as previous Farm Bills, are not being funded. Our current administration may be supportive in terms of its rhetoric for these programs, but the programs are eliminated from the budget when priorities are set and they are running out of money. Given the current budget situation, it seems unlikely that new funding will be coming in for innovative ideas; any solution will require a new approach to advocacy and constituency building that can influence Congress.



## Workshop Summary

On January 20 and 21, 2005, the members of the panel met with other scientists, landowners, lawmakers, and representatives of NGOs. The group discussed strategies to boost the wood products sector and support forest communities. The workshop primarily addressed three key topics.

### **MAKING FOREST OWNERSHIP ECONOMICALLY VIABLE**

Most forest owners are faced with significant economic challenges, struggling to make a profit; these economic problems lead to an often overwhelming pressure to sell land for development. While landowners struggle to make ends meet, workshop participants recognized that landowners are providing significant services—environmental, cultural, and aesthetic—for which they are usually not compensated. Many natural resources (endangered species, wetlands, or old growth stands) are effectively liabilities for property owners, but they should be assets. Finding innovative ways to compensate landowners and make land ownership more economically sustainable is crucial to boosting the U.S. forestry sector.

Conservation easements are important strategies for funding forest ownership, used frequently by land trusts and states to protect important parcels. Many conservation organizations want to see land preserved, however, rather than actively managed. Landowners may also be unwilling to place permanent restrictions on their properties since it might preclude management of an area if conditions change or the landowner's wishes change; and tax benefits are currently not applicable to temporary leases or easements.

Green payments, tax credits, or other financial incentives are more innovative ways to compensate landowners for keeping their land forested. Funding could come from communities that directly benefit from improved air and water quality, biodiversity, and other ecosystem services. Villagers in Oaxaca, Mexico pay for environmental services through taxes, New Hampshire pays landowners for allowing recreation, and the federal Conservation Reserve program compensates landowners

who conserve land. Perhaps the most effective example of these payments is the New York City Watershed Authority's work in the Catskill Mountains. Rather than pay for water treatment facilities, administrators pay landowners to protect water quality. In many areas water and other services are not in short supply; people act as free riders and demand is low. If demand does increase, however, and people can be held responsible for the services they receive, payments may create an additional incentive for citizens to conserve resources.

### **RECOMMENDATIONS**

Forest owners may be more amenable to participating in easement programs if they are temporary or have buyout provisions. The Healthy Forests Restoration Act contains a good model for establishing temporary leases.

Many landowners find success in selling hunting visas or "leases" on property or trading hunting rights for maintenance and labor. Similar leases could be developed with environmental groups for other services like wildlife habitat or water quality, or with recreation groups for rights to hike and camp.

Programs like the Conservation Reserve Program are important at the federal level. Forest sector lobbyists may be able to increase programs like this in the 2006 Farm Bill. It will be just as important to find funding for existing programs.

Continue monitoring programs like the NYC watershed protection program in the Catskill to ensure that they are actually having the intended effect and to ensure that all parties act responsibly.

### **INCREASING EDUCATION AND IMPROVING THE PUBLIC PERCEPTION OF FOREST MANAGEMENT**

There was a strong consensus throughout the workshop that wood is a high-quality, environmentally sound material when harvested from well-managed forests, and that forest certification programs are promoting good management practices. Those certification programs have given legitimacy to the environmental value of wood, but workshop participants agreed that there is further need to educate the public on the idea that forest management can enhance the environment.

The biggest opponents of wood use are still frequently environmental groups, though most conservation groups are now recognizing that forest management is preferable to development. It is also important to think about rural development—protecting communities in addition to forests—and municipalities need to be educated to the fact that development often means a loss of forest sector jobs and added burdens on the tax base for increased residential services.

Education of the media will be a critical step, since the media is the most effective way to reach the general public. Advertising has limitations, but news coverage and feature stories are important ways to reach out and change misconceptions. While the media tends to favor exciting stories and catastrophes, pitting different perspectives against each other, workshop participants felt that there was a need to bring balanced, moderate representatives of the forest community into the public eye. There must be public trust and understanding to drive policy change, which will require credible spokespeople like nonpolitical representatives of the Forest Service or working forest communities.

### **RECOMMENDATIONS**

Education in schools, camps, and innovative programs must focus on exposing students and teachers to sustainable forest management and demonstrating how it

can improve the environment. Tools like Landscape Management System modeling may help to portray the landscape.

News stories should be developed that feature moderate environmentalists and responsible sector representatives. The media can also be invited to view and portray sustainable, working forests; some foresters already offer tours and open houses to educate the public about management strategies and techniques.

The LEED (Leadership in Energy and Environmental Design) Green Building Rating System® can increase the use of certified wood. Certification programs run by organizations like the Sustainable Forestry Initiative® (SFI), the Canadian Standards Association (CSA), and the Forest Stewardship Council (FSC) can help change the public's perception of wood products and forest management. Land certification programs recognize landowners who practice sustainable forest management on their properties. While such programs are still uncommon, they may become important tools in conservation.

Marketing strategies will be important in changing the perception of wood products and forest management. Better labeling of all products (including wood substitutes) is important so that consumers are more aware of the differences between wood and other products. There is a need to improve marketing and public relations strategies for the forest service and forest policies. Studies have shown that words like "water," "wildlife habitat," and "carbon," elicit more positive responses from the public than "timber" and "forest products."

## CHANGING MARKETS AND POLICIES

Traditionally there has been no comprehensive forest policy in the United States because there hasn't been a united political will to create one. There was a strong political drive to create the Farm Bill, which gives farmers a strong voice. Subsidies and policies favor industries like oil and gas primarily because representatives of those industries have major political clout. The forestry sector also needs to gain influence in Washington, DC if it is to compete.

Currently, American wood producers are at a competitive disadvantage compared with overseas firms. Regulatory bureaucracies make it more difficult for American firms to gain approval and begin operations than some Scandinavian firms, for example. There are many inefficiencies in markets, however, which may be working against the wood products sector in America. Markets typically do not include externalities such as emissions produced in shipping, air pollution in harbors, and the transport of invasive species around the world. If prices for substitutes and foreign products begin to include externalities, local and domestic wood prices may become more competitive.

The range of new technologies, innovative policies, and changing markets in the wood products sector present opportunities for economic growth and environmental protection, along with many challenges. As oil prices continue to rise, the climate is improving for a shift back to wood products and to products produced locally. Taxes and policy changes can catalyze these shifts, but big public relations campaigns will be needed to support new policies. Subsidy structures in legislation like the Farm Bill are no longer effective and their cessation would help the forest sector. Finally, forest certification programs may allow mills to command a higher price for certified timber.

Regardless of improvements in the image of wood, people will still be looking for a cheap product; wood will not sell unless it is competitive with substitutes. The market changes and policy initiatives are really

ways to level the playing field to determine whether or not wood can compete economically with other materials, and whether or not American wood markets can compete with those abroad.

### RECOMMENDATIONS

Landowners and the forest sector are often passive, waiting for markets to develop or policies to change. The industry should aggressively seek markets, grants and other funding opportunities, and advocate for increased public research funding.

Supporting a products tax on steel, concrete, and other materials that are environmentally inferior, or on products shipped over long distances, could help to balance the economics of different products and make markets more efficient; national policies could also create incentives that favor the use of wood.

The industry should consider how to make use of aging facilities and equipment. Provisional operation permits may increase the speed with which companies can begin operating and make it easier to use older facilities; monitoring would be used to determine whether or not the permits should be revoked.

Rural America is being depopulated, which erodes the social infrastructure and creates further challenges for forest owners. A “green collar” workforce supported by small grants from government would help to boost the rural economy, improve the health of forests, and provide job skills.

The forest sector should continue reaching out to a broad spectrum of groups, including environmental organizations, creating a unified and powerful lobby. The industry also needs to show how forestry is related to defense, energy, international relations, or other fields that are ranked higher on the national agenda.

## Resources for More Information

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American Forest & Paper Association  
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American Forests  
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American Lands Alliance  
americanlands.org

American Tree Farm System  
treefarmssystem.org

Community Forestry Resource Center  
forestrycenter.org

Consortium for Research on Renewable Industrial Materials  
www.corrin.org

Forest Certification Resource Center  
certifiedwood.org

Forest Stewardship Council  
fscus.org

International Wood Products Association  
iwpawood.org

LEED Certification  
usgbc.org

National Urban and Community Forestry Advisory Council  
treelink.org

Rural Technology Institute, University of Washington  
www.ruraltech.org

SmartWood Program  
smartwood.org

Sustainable Forestry Initiative  
aboutsfi.org

USDA Forest Service Forest Products Lab  
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Wood Products Manufacturers Association  
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The Yale Forest Forum (YFF) was established in 1994 by a diverse group of leaders in forestry to focus national attention on forest policy and management in the United States. The group convened the Seventh American Forest Congress to collaboratively develop and articulate a common vision of forest management to diverse stakeholders.

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Marsh Hall, home of GISF,  
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The School's Global Institute of Sustainable Forestry continues this tradition, in its mission to integrate, strengthen, and redirect the School's forestry research, education, and outreach to address the needs of the 21st century and a globalized environment. The Global Institute fosters leadership through innovative programs, activities, and research to support sustainable forest management both domestically and worldwide.

In pursuit of these ideals, GISF has developed several programs to carry on the work of the Institute, including the Program on Private Forests, the Program on Forest Certification, The Forests Dialogue, the Program on Forest Physiology and Biotechnology, the Program on Forest Health, the Program on Landscape Management, and the Program in Tropical Forestry.

The Yale Forest Forum is now the convening body of the Global Institute of Sustainable Forestry. Through YFF, the Institute holds events at the Yale School of Forestry & Environmental Studies involving stakeholders from all sectors.

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