Forest Products Laboratory

NewsLine

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Research for Restoration: FPL's Role in the National Fire Plan

By Rebecca Hoene, FPL public affairs specialist

Wildfire season has arrived once again, with last year's catastrophic season still fresh in the minds of many. It's not easy to forget the devastation: 7.2 million acres burned, more than 2,000 buildings destroyed, and the lives of 23 firefighters lost.

Along with those shocking numbers comes an uneasy feeling about the fate of our forests this season. Many are wondering what can be done to slow the destruction and return fire to its rightful place in nature.

To address this pressing issue, the National Fire Plan was created as a cooperative, long-term effort of the USDA Forest Service, the Department of the Interior, and the National Association of State Foresters. This partnership allows the Federal government and state agencies to work together to manage the impacts of wildland fire on our Nation's communities.

With support from the National Fire Plan, researchers at the Forest Products Laboratory (FPL) are currently looking for ways to lessen the negative impact of wildfires.

One proven method of improving forest health while decreasing the risk of catastrophic wildfires is forest thinning. Today our forests struggle to sustain hundreds of stems per acre, when in the past they supported only a few dozen large trees. These small trees and dense underbrush are choking our Nation's forests, and they serve as an abundant source of fuel, sending fires easily out of control. By thinning some of this material, low-intensity, ecologically beneficial ground fires will once again be possible.

During thinning operations, curved small-diameter trees are often left in the forest because they contain lower-value wood and can be difficult to process. FPL research has resulted in the development of valuable products from the curved trees, such as this LamHeader, used over garage doors or large windows in home construction.

Unfortunately, thinning forests is not a simple answer to solving the wildfire problem. Thinning is a costly process, and because the resulting material is generally of very low quality, it is not always an economically feasible procedure.

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Forest Health: Not Just About Trees

Often when we think of forests, the first thing that comes to mind is trees. But forests are more than just groups of trees. Forests are complicated ecosystems that have many important components, such as water, soil, insects, fungi, and wildlife.

The Slashbuster breaks up forest thinnings and scatters them on the forest floor. FPL researchers are studying what affect this and other treatment techniques have on forest health and the risk of wildfires.

Researchers at the Forest Products Laboratory are dedicated to maintaining the health of the entire forest ecosystem. Although some of our researchers are studying ways to use forest thinnings and thereby decrease the threat of wildfires, others are looking at how thinning affects the health of other aspects of the forest ecosystem.

Jessie Micales, an FPL mycologist, is looking at how fungi can play a role in thinning operations to help restore the health of our forests. "Although we know thinning small-diameter materials from forests reduces the fire hazard, removal of these trees also weakens the soil," says Micales. "Some of the thinned material, or slash, should be left on the ground to provide nutrients and increase soil fertility."

Unfortunately, leaving some of the slash on the ground once again increases the fire hazard until the wood begins to decay. So in an effort to maximize the return of nutrients to the soil while minimizing the threat of fire, Micales and other researchers are looking at ways to speed up the natural decay process.

Micales's research involves two areas of study: determining which species of local fungi decay logs the fastest and determining what effect different thinning techniques have on the rate of decay.

In the decay fungi study, two of the three local fungi Micales tested started decaying the test log. One potential option may be to inoculate effective decay fungi on slash left

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Check out our website at http://www.fpl.fs.fed.us

Restoration Research *(continued from p. 1)*

In hopes of improving the economics of forest thinning, FPL researcher John Hunt is looking for ways to turn low-value thinnings into high-value products. Hunt's research projects, conducted with support from the National Fire Plan, include developing products from small-diameter curved trees and from undergrowth and tree trimmings.

During thinning operations, much of the small, curved material is left on the ground due to a lack of suitable uses for the material. Hunt, in partnership with Wyoming Sawmill, Genesis Laboratories, and the University of Wyoming, is combining several technologies to turn curved trees into valuable laminated structural products such as I-beams.

Hunt's research includes cutting curved logs from the Bighorn National Forest and the Wyoming State Forests with special sawing equipment that will follow the irregular shape of the log. He will also be looking at new drying methods to study the effectiveness of straightening curved logs during the drying process. Finally, the newly developed process, such as that which resulted in LamLumber and LamHeader *(see photo, page 1)*, will be tested for engineering and economic feasibility using these small-diameter trees.

"With the development of a successful processing system, each mill using the process could remove an estimated 8.5 to 17 million board feet of low-value material from the forests per year," says Hunt.

Another of Hunt's research projects aimed at improving the economics of thinning is his work with trees that are too small for structural applications, usually 4 inches or less in diameter. Hunt is working in partnership with the Forest Service's Southern Research Station, Bolton-Emerson Co., and Genesis Laboratories to develop a use for these thinnings.

"We are currently looking at using the very small material to produce structural panel products," says Hunt. "We're working to develop a system that could be easily incorporated at small plants near forests, allowing them to use the small-diameter, low-value thinnings to create a profitable product."

The process currently being evaluated involves fiberizing the thinnings, bark and all, and pressing them in a three-dimensional mold, creating an engineered panel product. Hunt is using a finite element analysis computer program to determine which designs are the strongest. Researchers then build and test the panels to determine their physical and mechanical properties. An economic analysis will also be conducted to find potential applications in the furniture and housing markets.

"This technology has promising uses in many applications," says Hunt, "including the construction of pallets, bulk bins, heavy-duty boxes and shipping containers, wall and roof panels, cement forms, partitions, displays, doors, and furniture such as desks, shelves, and tables. And by developing technologies that make use of the fuels building up in our Nation's forests, we can help restore the 73 million acres of national forests and 300 million acres of state and private lands still considered at risk of catastrophic fires."

The slash from a thinning operation conducted over 10 years ago is now extremely dry material on the forest floor, creating hazardous conditions and an increased risk of wildfire. This material could have been used to create a useful product, such as 3D Engineered Fiberboard.

ASK FPL

Wildfire season is here, and many folks are wondering what they can do to protect their own homes. Here are some tips that may make the difference if a forest fire threatens your home.

I am building a new home in a wooded area. What should I consider to make my house wildfire resistant?

You can take several steps to increase the chances of your home surviving a wildfire:

- Construct your home on even terrain; fire travels rapidly up sloped areas.
- Be sure your driveway is clearly marked and wide enough for fire crew equipment to enter if necessary.
- Consider external materials carefully; stucco and masonry are more fire resistant then wood or vinyl.
- Wood shakes and shingles must be fire-retardant treated.
- Consider using tempered glass windows, which stand up to heat better than plate glass windows.
- Consider a terrace instead of an elevated deck; debris may collect under the deck and increase the fire hazard.
- Avoid connecting wood fencing to your home; it acts as a path for the fire to follow. Choose an alternative fencing material or place a stone pillar between the fence and the home.

What can I do to make my existing home in the woods fire resistant without major remodeling?

The following maintenance and landscaping ideas will help protect your home in the event of a wildfire:

- Create a safety zone of at least 30 feet around your house. This area doesn't have to be barren; plant fire-resistant flowers and shrubs or plants with high moisture content, and keep grass trimmed low.
- Avoid stacking firewood near your house or other outbuildings.
- Sweep gutters, eaves, and roof on a regular basis.
- Prune tree branches to 6-10 feet to avoid fire jumping from low-hanging branches to your home.
- Cover windows and skylights with non-flammable screening and shutters.

For more information, visit the source of this article: www.firewise.org

Questions?

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Wood You Believe...

that recycling one ton of paper saves about 17 trees, 380 gallons of oil, 3 cubic yards of landfill space, 4,000 kilowatts of energy, and 7,000 gallons of water?

(Source: www.resourcefulschools.org)

that one tree can filter up to 60 pounds of pollutants from the air each year?

(Source: www.resourcefulschools.org)

New and Notable

Fire Resistance of Engineered Wood Rim Board Products.

White, Robert H. 2003. USDA Forest Serv. Res. Pap. FPL–RP–610. 22 p.

Engineered wood products, such as oriented strandboard, laminated veneer lumber, and other composite wood products, are being used more often in construction. This includes use as rim boards, which are the components around the perimeter of a floor assembly. This situation has increased the need for information about the fire resistance of these products. Using the data from this study, we evaluated possible construction options for achieving certain levels of fire resistance of engineered wood products in use as rim boards. We also developed a simple analysis method for evaluating the protection provided by the rim board.

Improving Engineered Wood Fiber Surfaces for Accessible Playgrounds.

Laufenberg, Theodore; Krzysik, Andrzej; Winandy, Jerrold. 2003. USDA Forest Serv. Gen. Tech. Rep. FPL–GTR–135. 15 p.

Some engineered wood fiber (EWF) surfaces are uneven, tend to shift, and have low density. The goal of our research was to develop a playground surface material that cushions impact and is accessible to people with disabilities. Seventeen test configurations were formed in plywood boxes, using different levels of EWF compaction, fiber moisture content, surface layer thickness, and types of binders. In this report, we identify the strengths and weaknesses of the surface treatments, review the viability of the systems and the testing concepts we have developed, and identify further research needs.

Forest Health *(continued from page 2)*

on the ground. Micales says it may even be feasible to use decay fungi that will grow into edible and medicinal mushrooms, creating a valuable product from small-diameter timber.

FPL researchers are also cooperating with the Forest Service's Forestry Sciences Lab in Moscow, Idaho, where they are watching how slash naturally decays as a result of different thinning techniques. These techniques include leaving whole thinnings on the ground, cutting branches from trunks and scattering them on the ground, controlled burning of piles of thinnings, and using a machine called the Slash Buster, which breaks the slash into small pieces and scatters it over the ground.

Decay is a lengthy process, so researchers are currently letting the fungi work and periodically checking the progress of decay under various circumstances. They are also monitoring soil health, animal attraction, and the number of trees coming back to repopulate each thinned area.

"We still have several issues to address, such as how to efficiently inoculate large forest areas and how to ensure fungi survive in the extremely dry forests of the West," says Micales. "But once completed, the results of this research will help determine the best practices for managing the health of our National Forests."

Forest Products Laboratory

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Chris Risbrudt
Director

The National Planning Committee of the National Association of Professional Forestry Schools and Colleges (NAPFSC-NPC) and the USDA Forest Service are sponsoring a Fall Conference at FPL, October 28 & 29, 2003. This year's theme is "Forest Products Priorities for the Future".

For more information go to http://www.fpl.fs.fed.us/npcbro.pdf

Award-Winning Work at FPL

Employees of the Forest Products Lab are known for their innovative work and historic achievements. Here we highlight several groups who were recently recognized for their outstanding accomplishments.

Secretary of Agriculture's Honor Awards

Henry Spelter received the USDA Honor Award for Expanding Economic and Trade Opportunities for United States Agriculture Producers. Spelter's research helped lumber and panel firms understand overcapacity and aided those working to resolve the U.S.–Canada lumber trade dispute.

FPL's Technology Marketing Unit received the USDA Honor Award for Enhancing the Capacity of All Rural Residents, Communities, and Businesses to Prosper. The TMU was recognized for their dedication and commitment to providing technical and marketing assistance to rural, forest-based communities and businesses.

USDA Forest Service Chief's Awards

Dr. Robert Falk received the Chief's Partnership Award for his partnership efforts in implementing wood-framed building deconstruction and lumber salvage.

D. Jean Lodge received the Chief's Award for Distinguished Science. Lodge is stationed in Puerto Rico where she is working to inventory more than 1,500 species of fungi, many of which were previously unknown.

C. D. Scott Award

Dr. Thomas Jeffries received the C. D. Scott Award at the 25th Annual Symposi-um on Biotechnology for Fuels and Chemicals. Jeffries was commended for his research on creating ethanol from plant matter.