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## The Answer's in the Wood:

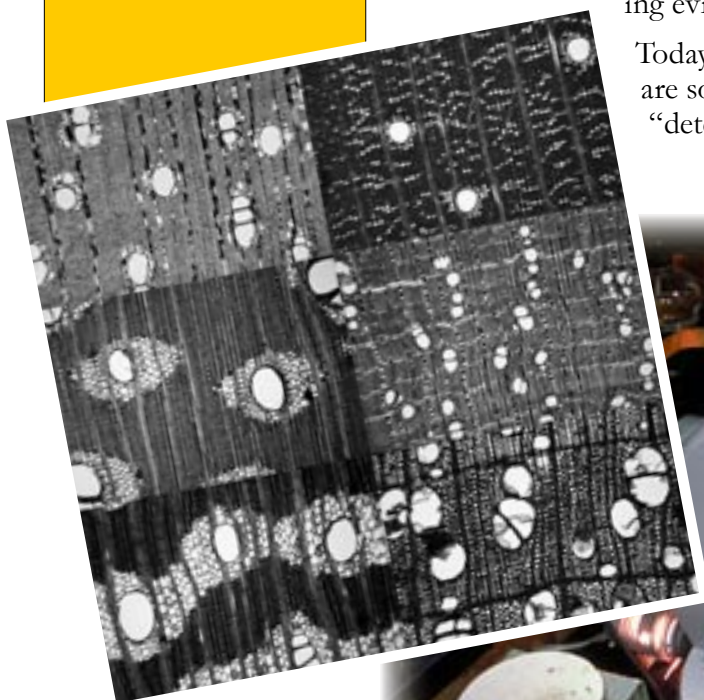
### Police Turn to FPL When Key Evidence Comes From Trees

by Rebecca Wallace, Public Affairs Specialist

It may seem far fetched to say that simply identifying a piece of wood could point toward the cause of a plane crash, fight the illegal trade of endangered species, or even catch a criminal. But it's possible, and it happens in the Center for Wood Anatomy Research at the Forest Products Laboratory.

The Center for Wood Anatomy has a long history of cooperation with law enforcement. In 1933, testimony presented by FPL scientist Arthur Koehler played a major role in convicting Bruno Hauptmann in the famous Lindbergh kidnapping. Koehler examined the ladder used in the kidnapping, making note of the species of wood used and identifying tool marks and nail holes. Koehler testimony during the trial is considered by some to be the most damaging evidence of the case.

Today, most wood-related mysteries brought to FPL are solved by botanist Alex Wiedenhoef, though "detective" could well be an accurate title for his  
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FPL botanist Alex Wiedenhoef can obtain a wealth of information by studying magnified images of wood cells.



## Join Us at SmallWood 2006

Enormous quantities of biomass are being generated from thinning operations, land clearing, and hurricane disasters. These issues drive the need to create solutions for using low-value and waste wood.


SmallWood 2006 will be held May 16–18, 2006, at the Sheraton Richmond West Hotel, Richmond, Virginia, to provide state-of-the-art information on small tree utilization and to foster peer-to-peer learning. The conference will include an international slate of speakers, including researchers, materials and equipment suppliers, manufacturers, and end-users.

SmallWood 2006 will feature two full days of technical and poster presentations, discussions, and tabletop exhibits on several topics:

- Community partnerships
- Forest health restoration
- Supply and availability
- Harvesting systems
- Processing and manufacturing
- Markets for products
- Energy from woody biomass
- Workforce training



The conference will also include a tour in the surrounding Richmond area of mill sites, biomass energy facilities, a state-of-the-art small-log sawmill, and related forest products businesses.

For more information on SmallWood 2006, contact Julie Lang at the Forest Products Society, [conferences@forestprod.org](mailto:conferences@forestprod.org) 

**NewsLine Team:** Gordie Blum, Rebecca Wallace, George Couch, Judy Patenaude, Jim Anderson, and Bill Ireland



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## The Answer's in the Wood *(continued from page 1)*

position. Many of the 2,500 wood identifications he completes each year are routine, but every so often, Wiedenhoefft gets to try his hand at investigation.

### Sorting Out Eye Witness Reports

When a jet clipped some trees and crashed while attempting to land at an airport runway, several people witnessed the incident and reported to investigators what they saw. But the reports conflicted, and investigators had a difficult time determining exactly what happened. "Some claimed the engines were running as the plane crashed, and others said they were off," said Wiedenhoefft. "Some people saw smoke, while others didn't. The police needed more solid information."

In an attempt to find out what really happened as the plane went down, detectives brought tree clippings found in the engine compartments to the Center for Wood Anatomy. Wiedenhoefft deduced quite a bit of useful information from the small pieces of leaves and twigs.

"First, I identified the samples of wood, which helped determine exactly where the plane entered the trees as it crashed," said Wiedenhoefft. "Then I began to look more closely at the condition of the material itself."

One observation Wiedenhoefft made was that the pieces of wood had been shredded, indicating that the turbines were moving as the plane entered the tree line. He also noted that the material was charred. With the help of Robert White, a scientist in FPL's Fire Safety research unit, Wiedenhoefft was able to give detectives an approximate temperature of the engines when they hit the trees.

"Fire research at FPL has allowed us to figure out a range of temperatures where wood chars when fire is not present," said Wiedenhoefft. "That information was very valuable in this case."

Ultimately, Wiedenhoefft's investigation of the wood samples led detectives to the conclusion that the engines were running, or had been very shortly prior to the crash. But Wiedenhoefft never

did find out the actual cause of the crash. "That happens a lot," he said. "Even though I play a role in the investigation, most often I don't find out how the cases end."

### Hampering Illegal Trade

Wiedenhoefft doesn't just know a lot about identifying endangered species of tropical woods, he wrote the book on it. Literally.

Along with now-retired FPL botanist Regis Miller, Wiedenhoefft wrote a manual on identifying endangered species at the request of the Convention on International Trade in Endangered Species, or CITES.

"CITES is a group of treaty-bound countries that are committed to abide by laws set to protect endangered plant and animal species," said Wiedenhoefft. "They already had identification guides for endangered birds and reptiles and wanted to create a guide for wood, as well."

Wiedenhoefft and Miller wrote the guide, published in 2002 in Spanish, English, and French, for field identification specialists who are stationed at import and export locations around the world and are responsible for detecting and stopping illegal activity.

The manual was created in a format that could be easily understood and used effectively after just one afternoon of training. Wiedenhoefft conducts the training himself, and stays involved in the process as a backup for tricky identifications. "If there is a material the field identification specialists can't figure out using the guide, they can always send it to me," he says.

When asked to be involved in the project, Wiedenhoefft saw it as part of his professional responsibility. "We had the expertise necessary to produce this guide and fully understood the value of training professionals to take this law enforcement seriously," he said. "We saw it as a chance to have a global impact on the illegal trade of wood."

And their work is definitely having an impact. A field identification specialist trained by Wiedenhoefft recently suspected a wood product coming

*(continued on page 5)*



## Ask FPL

*We get thousands of questions each year about wood and paper products. In each issue of NewsLine we print what we feel are some of the best. Here's one we recently received.*

### Questions?

Contact us at  
Forest Products Laboratory,  
One Gifford Pinchot Drive,  
Madison, WI 53726-2398  
<http://www.fpl.fs.fed.us>

or write  
mailroom\_forest\_products\_  
laboratory@fs.fed.us

We can also be reached  
by telephone  
at


608-231-9200

TDD  
608-231-9544

FAX  
608-231-9592

**When working with large pieces of pressure-treated lumber, does sawing or drilling holes in it affect the effectiveness of the preservative?**

Larger pieces of pressure-treated wood often are not completely penetrated with preservative. As you cut these members to length or drill holes into them during construction, you may expose untreated wood. (Be sure to follow the recommended safety procedures when working with treated wood. Handling precautions can be found in Chapter 14 of the Wood Handbook on the FPL website.) Field treating this exposed wood with preservative will help ensure the durability of the construction project. One of the most effective field treatment preservatives is copper naphthenate dissolved in mineral spirits (the solution should contain at least 1% copper metal). Copper naphthenate does have an odor and imparts a greenish-brown color to the wood, which may not be desirable for some applications. Zinc naphthenate, a colorless alternative that is available in some areas of the United States, is not as effective as copper naphthenate but does provide some protection.

The field treatment solution can be simply brushed onto the exposed surface. If practical, the member can be stood on end in a shallow container of treatment solution, which can effectively treat several inches along the length of the member because the solution wicks up along the grain. Bolt holes are more difficult to treat, but a small brush or squeeze bottle can be effective. When working with preservative solutions, it is important to read and carefully follow directions for use on the product label. The recommended safety precautions should also be followed. 

### Helping the Wood Products Industry Profit from the Next 10 Years

The USDA Forest Service's Wood Education and Resource Center (WERC) and Dovetail Partners, Inc., a Minnesota-based organization that promotes sustainable forestry and responsible trade and consumption of forest products, have

scheduled a workshop to help hardwood industries respond to the rapidly changing marketplace. The workshop will be at the WERC facilities in Princeton, West Virginia, on April 11 and 12, 2006.

For more information, contact Dovetail Partners at (651)762-4007, or e-mail [info@dovetailinc.org](mailto:info@dovetailinc.org), or visit <http://www.dovetailinc.org>.





## Historic Wooden Bridges Being Studied *(continued from page 6)*

first challenge is to adapt the system's components to work together effectively and reliably in an outdoor environment, where they are affected by fluctuating temperatures, wind, and rain or snow. "So far, they've been operating nearly 100 percent of the time, but the winter weather could be a real test," Phares said.

The second challenge is to perfect the algorithms used to combine and interpret data from the monitors and decide whether to send an alert. "For example, the system will need to be able to distinguish between a person and a deer or large dog approaching the bridge," Phares explains.

Phares hopes to make recommendations on how these technologies could best be used to monitor other types of bridges for a variety of threats, including terrorism.

The six covered bridges in Madison County are also monitored by video cameras, supplied by a local Internet service provider. If vandalism does occur, the videotapes could be used afterwards to help identify a suspect.

"This kind of research project demonstrates the synergies created when the resources of FPL can be applied to a university research project that has direct and immediate benefit to citizens and taxpayers," said Michael A. Ritter, assistant director of the FPL. "Through the Coalition for Advanced Wood Structures (CAWS), universities, industry groups, and FPL are able to join efforts to address important and complex research issues around wood structures such as bridges, houses, and commercial buildings."



## The Answer's in the Wood *(continued from page 3)*

into the United States was made from an endangered species. Her suspicion was confirmed by Wiedenhoeft, and the discovery sparked an ongoing investigation by the Office of Inspector General.

### Catching a Criminal

In rural Wisconsin, a company's property was being continuously vandalized. Company officials were sure the vandal was a disgruntled former employee who had been recently fired, but there was no proof of who was committing the crimes.

Finally, police identified the former employee as a suspect after several company signs were run down and the front of the former employee's car was damaged. The suspect denied any involvement in the incident and claimed the damage had

occurred when he accidentally hit a tree on his own property. Unconvinced, police obtained samples of wood from the suspect's car and brought them to the Center for Wood Anatomy.

"The first thing I noticed was that there was no bark present in the wood samples," said Wiedenhoeft. "What are the chances that someone would hit a tree and there be no bark in the material left on the car?"

But police needed more solid evidence, so Wiedenhoeft turned to his wood identification skills. He found the answer they were looking for almost immediately.

"Some of the wood obtained from the vehicle was identified as creosote-treated Douglas fir," said Wiedenhoeft. "There was plenty of evidence from that one discovery alone: live trees are

not filled with preservatives, and Douglas fir trees grow in the Pacific Northwest, not in Wisconsin, so he couldn't have hit that tree on his property." Any remaining doubt was put to rest when Wiedenhoeft found that the samples from the suspect's car matched samples taken from the broken sign post.

Wiedenhoeft is glad to be able to put his unique skills to use in so many ways, and he enjoys the challenge of playing "wood detective" when the opportunity arises. "There are so many things to consider when studying samples of wood, and clues can come from the smallest details," he says. "A difficult wood identification is like a good crossword puzzle, and solving it is just as satisfying."





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One Gifford Pinchot Drive  
Madison, WI 53726-2398

Chris Risbrudt  
Director

## Computerized Monitoring System for Historic Wooden Bridges Being Studied in Iowa

by George Couch, Public Affairs Specialist

Researchers at Iowa State University's Bridge Engineering Center (BEC) are looking at ways to protect some of the state's most famous landmarks—its wooden covered bridges—from arson and vandalism. The 119-year-old bridge that adorned the cover of the 1992 novel, *The Bridges of Madison County*, was destroyed by arson in 2002; a second Madison County covered bridge was seriously damaged the following year.

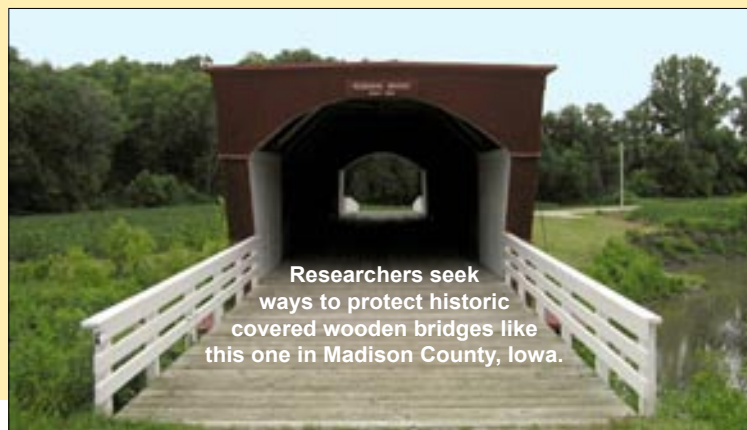
Working through a cooperative research agreement

with the USDA Forest Products Laboratory, the BEC has equipped one bridge with a monitoring system that alerts authorities to the presence of fire or a potential vandal. The monitors being evaluated include a flame-detection device similar to those used in warehouses,

an infrared camera, and fiber-optic sensors that detect temperature changes.

Data from the monitors are analyzed by an autonomous computer located at the bridge. If the computer software concludes there might be a problem, it alerts the local police or fire department.

The research challenge is two-fold, according to project leader Brent M. Phares, the associate director of the BEC. The  
*(cont. on page 5)*



Researchers seek ways to protect historic covered wooden bridges like this one in Madison County, Iowa.