



Cross-laminated timber panel made from small-diameter logs harvested from a national forest. Courtesy of Wooden Haus Supply.

# CLT from Small-Diameter Trees: One Localized Innovation, Multiple Solutions

Wood from more than one tree and solutions for more than one problem, all bound up and glued together in a singular idea for a single product.

The product is cross-laminated timber (CLT), but with a material twist thrown in by entrepreneur Pat Clark. CLT is a large-scale, prefabricated, solid engineered wood panel manufactured from layered and glued lumber. Traditionally, it's been formed from 2 x 6 and larger lumber milled from trees greater than 8 inches in diameter.

Clark's idea was to take the small trees and produce 1- to 4-inch-wide lamellas and lumber that's thinner than what's typical for CLT and turn it into a high-quality building material. While that wasn't an entirely new concept—companies in Canada and Europe have been doing it for some time and a few U.S. companies have a head start—it wasn't happening in Montana.

Thanks to a Wood Innovations Grant from the U.S. Department of Agriculture, Forest Service, and a unique partnership with a family-owned logging and milling operation, Clark's initiative is taking shape in a high-quality building material and a facility to make it.

By using small trees, the project is also helping to take down a long-standing challenge for the Forest Service, address a deterrent for logging companies, and capture carbon dioxide. In addition, it could serve as a model for rural jobs creation and economic development.

## The Problem

Clark calls it "a massive problem of our own creation." Post-World War II, the U.S. population



A small-diameter log, harvested from a national forest, that will be used to make cross-laminated timber. Courtesy of Wooden Haus Supply.

exploded, and with it the need for lumber. That led to the commercial harvesting of sizeable trees in national forests at “very high-scale, unsustainable levels.” Further, the regrowth of the trees in western Montana has been dense and slow, resulting in an abundance of small-diameter trees.

Overly dense forests are a serious issue for forest health and wildfire potential, which is becoming crucial in the context of climate change. The Forest Service is making historic investments to increase the scale and pace of forest health treatments to protect communities and improve American forest resilience. This includes removing small-diameter trees that aren’t of interest to lumber mills. Without an economic incentive to remove them, they become the abundant fuel that runaway fires crave.

These trees are too small for the sawmill lines of timber companies like F.H. Stoltze Land and Lumber, Columbia Falls, MT, which for 110 years has made its living on traditional 2 x 6 and larger products. Stoltze usually ships the small stuff to companies that turn it into lower value products.

### Opportunity to Solutions

Clark learned how to design and construct buildings with CLT while touring Europe in the early 2000s. He’s been importing large panels from Europe for his company, Wooden Haus Supply, Whitefish, MT, and in 2011 he assembled his first CLT building.

Then he thought, “What if we could produce CLT out of small timber that’s essentially going to waste right here?”

To get rolling, Clark needed a sawmill partner. After approaching Stoltze multiple times, the owners realized the process was not only possible but profitable. The result is a Wooden Haus-Stoltze joint venture called Stoltze Timber Systems; Clark is the managing partner.

Testing proved the panels have the strength, dimensional stability, and rigidity to meet the American National Standard for CLT, and Clark is finalizing designs for a manufacturing facility.

“Let’s call it a pilot project for demonstrating high-value utilization of small-diameter timber,” he said. “We’re hoping this can be a template for new business opportunities for sawmills and communities in fire-prone areas across the West.”

### More Information

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## FAST FACTS

- CLT panels from small-diameter trees meet the ANSI/APA PRG 320 standard.
- Project enhances forest resilience by removing hazardous fuels for wildfires.
- The small-diameter-tree initiative can be a model for other sawmills and communities in fire-prone areas.



Small diameter timber lamstock sawn at the F.H. Stoltze Land and Lumber sawmill. Courtesy of Wooden Haus Supply.