TECHLINE
Properties and Use of Wood, Composites, and Fiber Products

Using Dead Alaska Yellow-Cedar

Yellow-cedar trees have been dying on more than 500,000 acres of forest in southeastern Alaska since the 1880s. Trees dead for up to 100 years stand as snags and appear to have sound wood in some stands. Yellow-cedar cut from live trees is an important and valuable species in Alaska, while dead snags are currently used mainly for firewood. There is considerable interest in removing these snags to improve forest health, but this is not economically feasible unless higher value uses can be found. The first step towards finding a higher value use is to determine the mechanical properties of the dead snags compared to the live trees.

A study to determine if the mechanical properties of dead yellow-cedar snags decline over time and phase I of a cooperative study between the Forest Products Laboratory (FPL) and Region 10 have been completed.

In phase I, 30 trees were sampled from Wrangell Island in southeastern Alaska. Trees were selected in five "classes." These classes were live (control), Snag Class II (mean time since death of 14 yr), Snag Class III (dead 26 yr), Snag Class IV (dead 51 yr), and Snag Class V (dead 81 yr). Material was shipped to FPL and samples prepared for testing in bending. A summary of the results at 12% moisture content is shown in the table. Equivalent values for coast Douglas-fir are given for comparison.

The properties of the dead cedar in classes II-V are generally equal to, or higher than, those of the live cedar. This result was unexpected, and is believed to involve the presence of "black stain" in the live cedar. The dead cedar did not have the black stain. The properties of the dead cedar appear to be nearly equivalent to those of coast Douglas-fir. A second sample has been obtained to learn more about the cause and effects of the black stain and to increase the overall sample size. An interim report from phase I is available.

Initial results on the properties of dead yellow-cedar from Alaska are very encouraging. Additional information that will be needed includes:

1. A more detailed survey of the dead cedar resource. Ultimately, volume estimates by snag class and an estimate of the extent of severe spiral grain are needed.
2. Information is needed on the quality of dead cedar from other locations.
3. When utilization options and commercial interest become clearer, a study of product yield, including stress-rated lumber, would be helpful.

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References

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Strength properties of Alaska yellow-cedar from phase I of study.

		Alaska yellow-cedar				
Property[a]	Douglas-fir	Live (Control)	Class II (14 yr)	Class III (25 yr)	Class IV (51 yr)	Class V (81 yr)
Specific gravity	0.48	0.45	0.48	0.49	0.46	0.46
MOE (10^6 lb/in^2)	1.95	1.50	1.97	1.75	1.89	1.78
MOR (10^3 lb/in^2)	12.4	12.1	14.7	13.9	13.5	13.2

[a]MOE, modulus of elasticity; MOR, modulus of rupture.

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