Montana Forest Products Marketing News

MSU Extension Forestry

August 2005

Is Montana's Timber Harvest Sustainable?

Sustainability is defined as "meeting the needs of today without compromising the ability of future generations to meet their own needs". In forest management terms, sustainability is often thought of as harvesting trees on a sustained-yield basis. In other words, harvesting timber at a rate equal to or less than the rate at which it grows. While forest management on a *strict* sustained-yield basis fails to incorporate other biological processes into management considerations, it is useful for comparing *net annual growth* to *annual harvest*.

And that is what researchers at the University of Montana's Bureau of Business and Economic Research recently did in a report prepared for Montana's congressional delegation. Some of the findings include:

Supply—Of Montana's 93 million acres, about 19 million are classified as non-reserved forestland. The net volume of timber on those acres is 35 billion cubic feet. Each year an addition 824 million cubic feet is added through tree growth. Tree growth, however, is offset by annual tree mortality of 377 million cubic feet. Thus, net annual growth is 447 million cubic feet.

Demand—In 2004, approximately 160 million cubic feet were harvested in Montana. This amount is down from a peak of about 275 million cubic feet in the late 1980's.

Comparing *current harvest* to *net annual growth* shows that each year Montana's forests add approximately 287 million cubic feet of timber to their existing volume of 35 billion cubic feet.

Click here for more information from this report.

Inside this issue:

Timber Sale Management Workshop Scheduled

Forest landowners can use a timber sale to help meet forest stewardship objectives. For example, by harvesting timber a landowner might improve the health of remaining trees, enhance forage production for cattle or wildlife, or establish roads and trails for recreation.

Unfortunately, many landowners have had confusing and frustrating timber sale experiences. Therefore, MSU Extension Forestry is designing a workshop to familiarize forest landowners with the timber sale process.

Topics that will be discussed include: identifying property and timber sale boundaries, deciding what trees to harvest, determining how much timber you have to sell, tax liabilities arising from the sale of timber, timber contracts, how to solicit offers from prospective buyers, selecting a logger and logging system, and sources of professional assistance.

The workshop will be held October 13 and 14 at the Lubrecht Forest in Greenough, MT. Next month's MFPMN issue will have a link to more information and a registration form.

Conversions:

Last month's MFPMN included an article about forest products measurement units. Several readers requested additional information about converting between cubic feet and board feet. The conversion depends on factors like log diameter, log length, log taper, and log rule.

A commonly accepted range is that between:

160 and 220 cubic feet = 1,000 board feet

Using Wood is Good for the Environment!

A couple of years ago a friend of mine needed to buy some decay resistant beams for a garden project. As an "environmentally concerned" person, she asked me if it would be more environmentally friendly to buy beams made from wood, plastic, or steel?

As you might expect, I encouraged her to use naturally decay resistant cedar or redwood beams (she didn't want to use chemical preservative treated wood near her vegetable garden). Several weeks later, I learned that she bought plastic beams. She had decided against redwood or cedar because having grown up in Northern California, she thought those tree species were too majestic to cut.

I can not argue about the majesty of Northern California's forests, but perhaps my friend would reconsider if I told her about *Life Cycle Assessment (LCA)*—a procedure for estimating the environmental impact associated with manufacturing, using, and disposing a product. LCA is a method for measuring all the energy inputs, polluting outputs, and disposal impacts associated with manufacturing a product. For example, an LCA of lumber includes measuring fuel used for chainsaws, skidders, log trucks, etc. as well as energy to run the sawmill. Pollution outputs are also tracked as are the impacts of disposing the product.

CORRIM—the Consortium for Research on Renewable Industrial Materials is the group that developed the LCA idea. It is a non-profit organization comprised of university and industry research groups.

After creating an inputs, outputs and disposal database, CORRIM researchers compared the "environmental cost" of building a home in different parts of the country using the three different materials.

The results showed that steel framing used 17 percent more energy than wood construction for a typical house built in Minnesota, and concrete construction used 16 percent more energy than a house using wood construction in Atlanta. And in these two examples, the use of wood had less global warming potential, with steel at 26 percent more and concrete at 31 percent more. See the full report here.

The CORRIM researchers hope that the type of information and data provided in this report may be increasingly useful as consumers and government agencies try to identify construction techniques and building materials that minimize environmental impacts.

If my friend had seen this information, she might now be the proud owner of a wood-framed garden bed!

Minneapolis house	Wood frame	Steel frame	Difference	Steel vs. wood (% change)
Embodied energy (GJ)	651	764	113	17%
Global warming potential (CO_2 kg)	37,047	46,826	9,779	26%
Air emission index (index scale)	8,566	9,729	1,163	14%
Water emission index (index scale)	17	70	53	312%
Solid waste (total kg)	13,766	13,641	-125	-0.9%
Atlanta house	**Wood frame**	**Concrete frame**	**Difference**	**Concrete vs. wood (% change)**
Embodied energy (GJ)	398	461	63	16%
Global warming potential (CO_2 kg)	21,367	28,004	6,637	31%
Air emission index (index scale)	4,893	6,007	1,114	23%
Water emission index (index scale)	7	7	0	0%
Solid waste (total kg)	7,442	11,269	3,827	51%

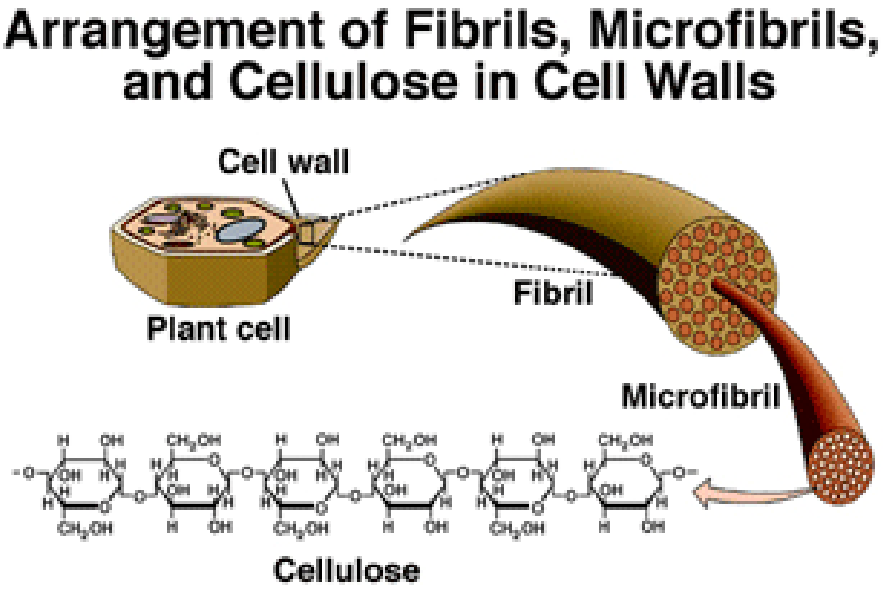
Table showing the various inputs and outputs associated with several building materials used to construct a conventional home in two areas of the United States. Source: *Forest Products Journal,* Volume 54 Issue 6.

NIS—an important emerging technology

Have you ever looked at a piece of lumber and wondered about the *microfibril angle* in the wood cells?

I haven't either, but maybe we should. That's because microfibril angle is an important determinant of wood strength. Microfibrils are crystalline chains of cellulose molecules that are arranged in a precise fashion within a wood cell. Wood cells are generally oriented parallel to the long axis of a tree's trunk. When each cell's microfibril chains happen to be oriented more or less parallel to the long axis of the cell (and the tree trunk) then the lumber made from that tree tends to be stronger than lumber made from a tree in which microfibrils are oriented at a greater angle to the cell's long axis and the tree's trunk.

Wood scientists have understood the relationship between microfibril angle and wood strength for decades. However, quickly and easily measuring microfibril angle has been problematic. That is changing, however, with the development of NIS (near infrared spectroscopy). NIS is a fast and non-destructive method for measuring various wood properties. It works by focusing an energy beam on a piece of wood and then measuring how much energy is absorbed and how much is reflected. Wood scientists have correlated those measurements with wood properties such as microfibril angle, moisture content, and chemical composition.



A diagram showing how cellulose forms microfibrils, which in turn form microfibril bundles, which in turn form the plant cell wall.

Researchers predict a number of applications for NIS technology. For example, tree improvement programs are likely to change. In the past, seed trees were selected mostly because of characteristics such as insect and disease resistance, size, and shape. While those characteristics are important, they likely have little relationship with wood quality at the cellular level. Using NIS, however, trees can be quickly and non-destructively selected based on important characteristics (like microfibril angle) that up until now have largely been ignored.

This technology might also be applied in wood processing. For example, a lot of softwood lumber is visually graded, i.e. a lumber grader assigns a grade to each piece of wood based on the size and location of knots, growth ring width, and slope of grain. In contrast, using NIS to grade lumber based on microfibril angle would result in a more precise strength measurement and grading system.

For more information about this emerging technology click here.

"Have you ever looked at a piece of lumber and wondered about the microfibril angle in the wood cells?

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Montana State University Extension Forestry is a branch of the MSU Extension Service and is housed cooperatively with College of Forestry and Conservation at the University of Montana in Missoula, Montana.

The mission of Extension Forestry is to provide education and outreach to non-industrial private forest landowners, forestry industry, and other forestry-related organizations in Montana.

Extension Forestry carries out its mission by providing its stakeholders with educational workshops, publications, news-releases, brochures, and videos. Common topics include forest stewardship planning, forest insect and disease, windbreaks/living snow fences, alternative forest management practices, wildfire hazard reduction, forest products marketing, and tree pruning & care.

We're on the Web:

http://www.forestry.umt.edu/hosting/forestproducts/index.htm

Did a friend send this newsletter to you?

If so, sign up and we can send the newsletter directly to your email address.

Do you have comments, story ideas, or other suggestions?

If so, send them to Roy Anderson, newsletter editor

MSU Extension Forestry Educational Calendar

Riparian/Wetland Forest Stewardship Workshop
August 15,16, & 22
Helena

Timber Sale Management Workshop
October 13 and 14
Lubrecht Forest

Forest Stewardship Workshop
August 18,19, & 20
Yellow Bay

For further information about any of these events contact:

Forest Stewardship Workshop
September 15,16, & 23
Hamilton

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Montana Tree Farm Annual Conference
October 1
Lubrecht Forest