SmallWood 2008 and Beyond
Wisconsin Mobile HewSaw Story

The Mobile HewSaw Demonstration

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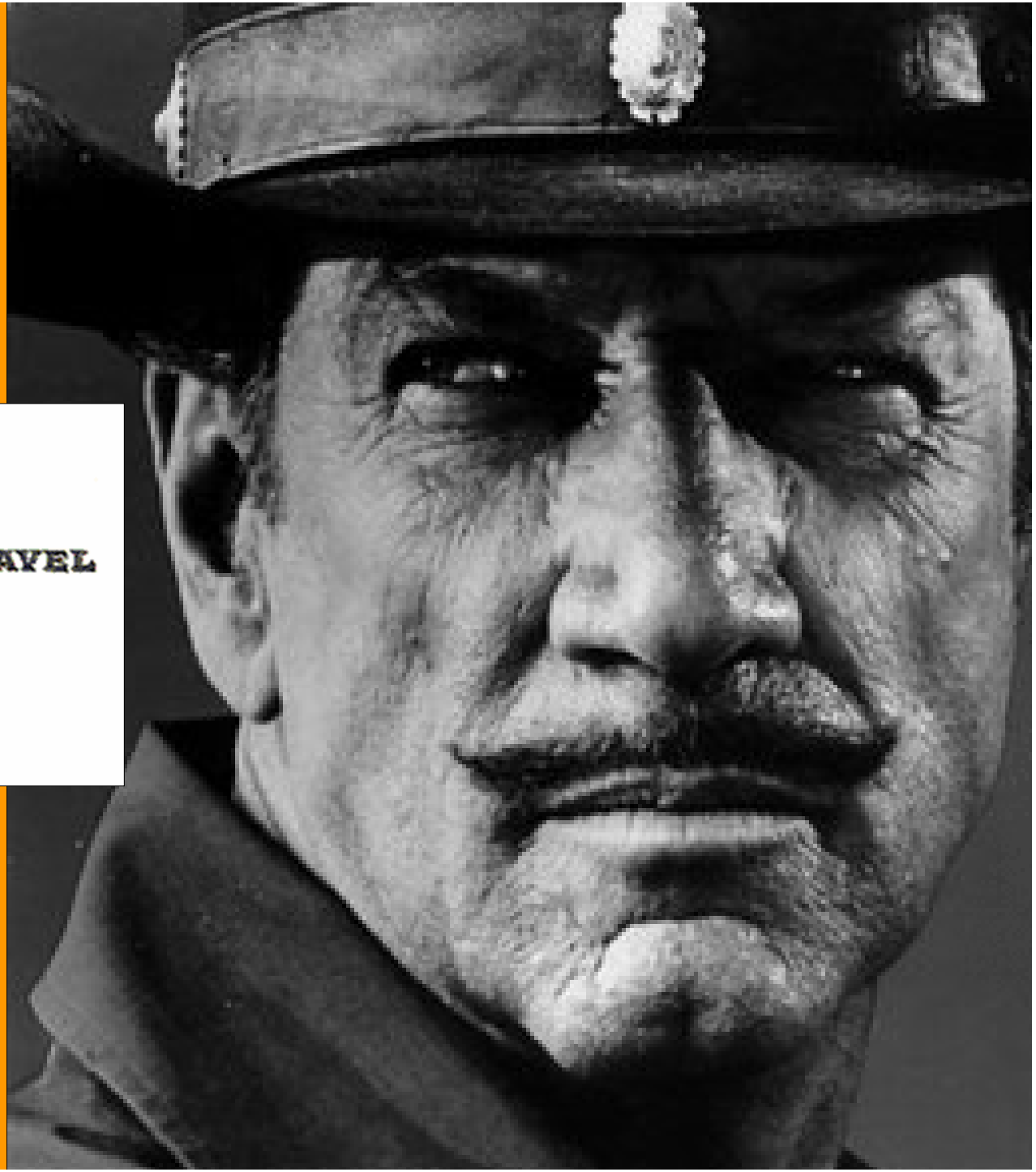
Rusty Dramm, Forest Products Laboratory
Ralph Hamel, Ralph Hamel Forest Products
Russ Vaagen, Vaagen Bros. Lumber Co., Inc.
Terry Mace, Wisconsin DNR, Division of Forestry

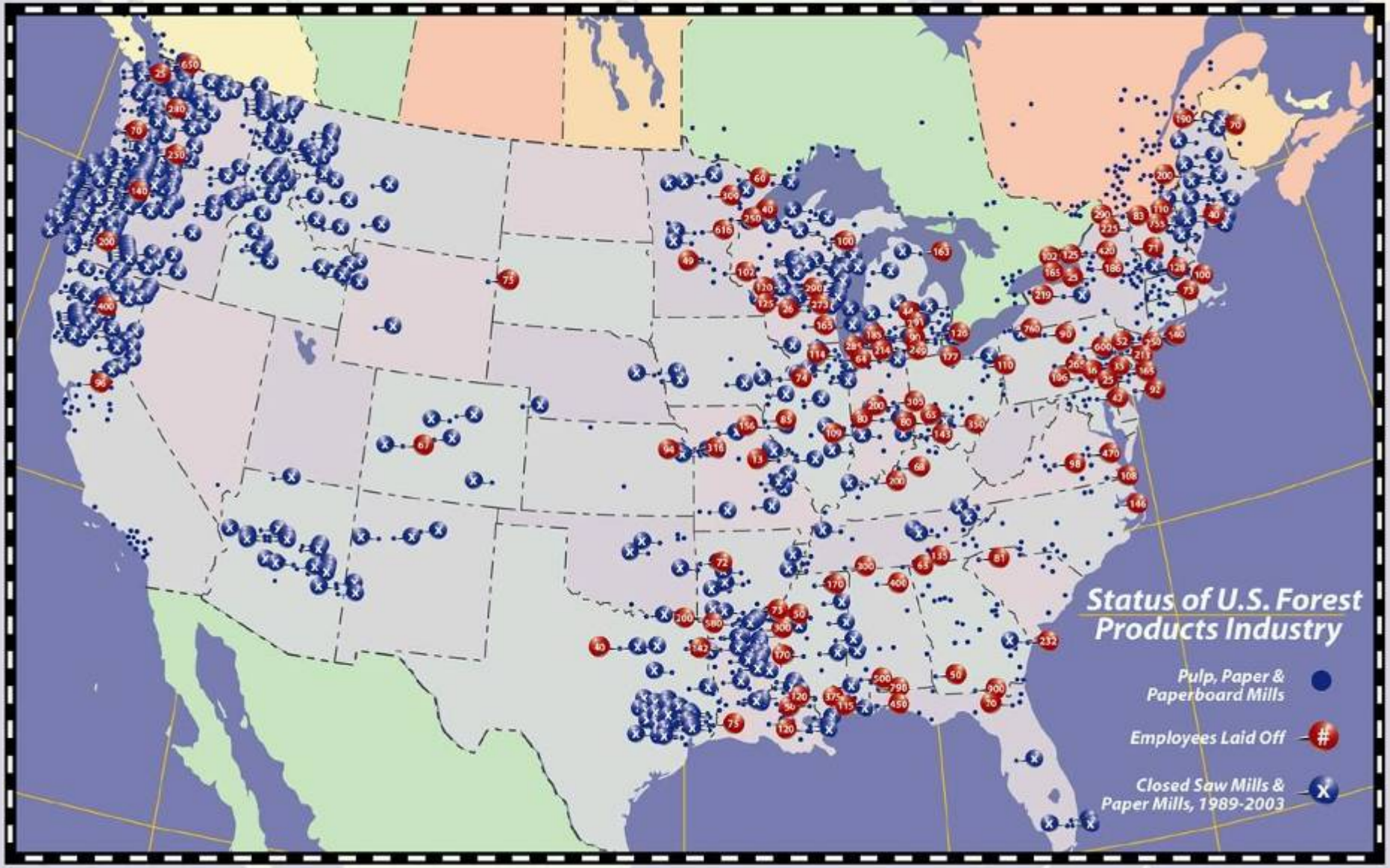
HAVE MILL WILL TRAVEL

RUSS VAAGEN
COLVILLE, WA



The forest products industry plays a vital role by providing an economic engine for forest dependent communities and an economical outlet for wood and biomass removals from forestry operations.

Mill Closures & Layoffs, 1989 - 2003



Why this Project?

Driving Issues

- US Forest Service—managing forest fuels buildup in the Western U.S. through utilization
- Wisconsin DNR—excess supply of 250,000 cords of pulpwood and loss of 40,000 Wisconsin forest products jobs since 2006
- Vaagen Bros.—need to find ways to utilize smaller quantities of small-logs economically

Boise NF Small-Tree Utilization Demonstration

Vaagen Bros. Interest in Mobile Sawmilling

- Investigating alternatives to high capital cost of small-log sawmills
- Why?—scattered log resource often does not justify the necessary capital investment for an optimized small-log sawmill
- Can we reduce the capital investment—without significantly increasing per unit operating costs or giving up too much lumber recovery?

Vaagen Bros. Interest in Mobile Sawmilling

- Vaagen Bros. purchased mobile HewSaw from an operation in New Zealand
- Demonstrate potential for processing small diameter from a more scattered small-log resource and from forest fuels projects
- Vaagen Bros. worked with Terry Mace, WisDNR on locating the demonstration site

Vaagen Bros. Interest in Mobile Sawmilling

- Vaagen Bros. partnered with Ralph Hamel Forest Products in Vesper, WI—managed the day-to-day operations and provided marketing
- Plum Creek Timber Company—contracted to supply 6,500 green tons of first and second thinning red pine plantation pulpwood
- Domtar bought the pulp chips—other mill residues went to several other local markets

Mobile HewSaw Demonstration

Vaagen Bros. Lumber, Inc.

Hamel Forest Products

HewSaw Machines, Inc.

Plum Creek Timber Co.

Forest Products Lab

Wisconsin DNR

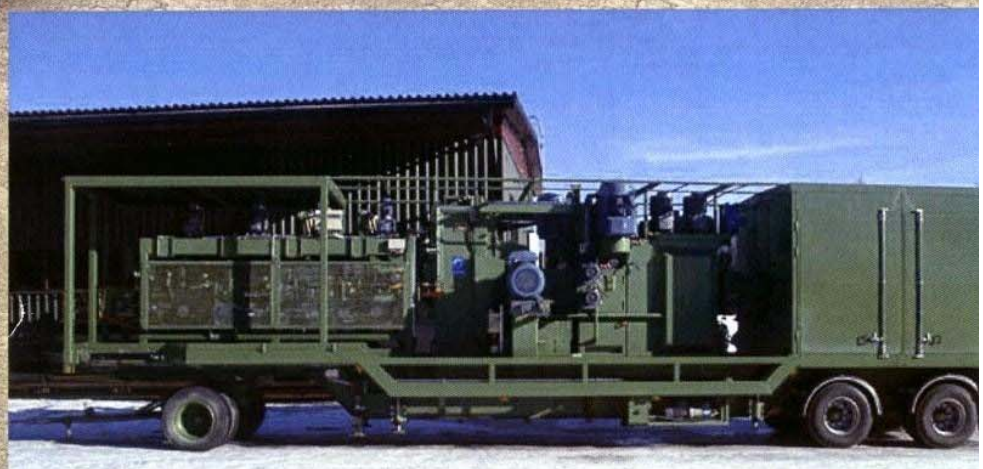
Alliant Energy

Domtar

LD Jellison, Inc.

Glacierland RC&D Council

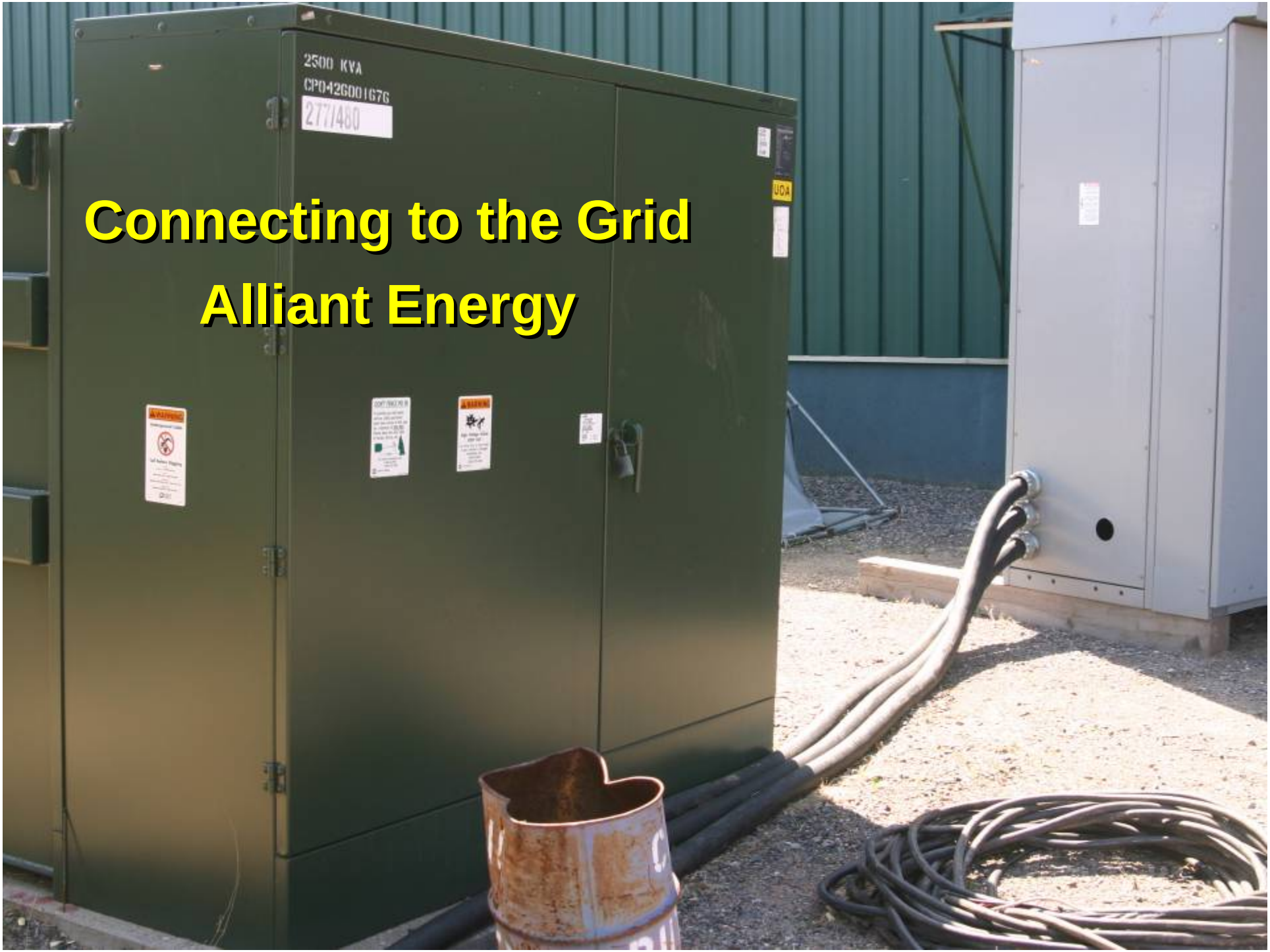
Univ. of Wisconsin-Extension



Graphics Courtesy of HewSaw & Vaagen Bros.

Mobile HewSaw Mill arrives in Wisconsin

Setting Up the Mill


2500 KVA
CP0426001676
277/480
Connecting to the Grid
Alliant Energy

Log Infeed and Lumber Outfeed Engineering

Bark Residue Handling


Residues
Pulp Chips
Hog Fuel
Sawdust
Bark


Sawdust and Fines


Bark Residue Storage

Wisconsin's Red Pine Plantation Resource

Pulpwood alternatives—can we produce softwood lumber from Wisconsin's red pine resource?

Red pine logs purchased by weight basis from Plum Creek Timber Co.


Unsorted Red Pine 12-Foot Bolts

Sorting Logs

Log Manufacturing Issues

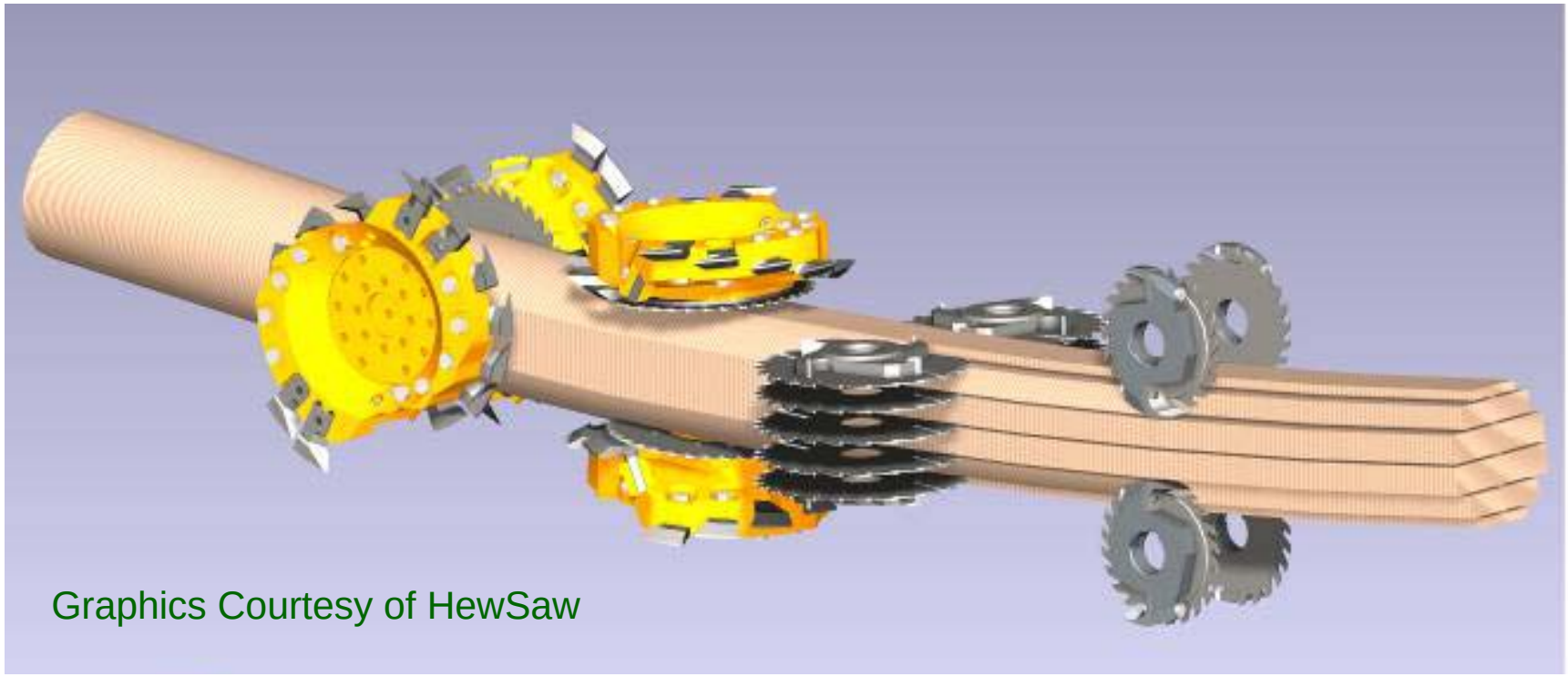
Mobile HewSaw Mill 6,500 Ton Test

Loading sorted red pine logs with a Polar Pre-hauler


Log Infeed and
Debarker
VK VALON KONE

Sawyers Control Booth


Tuning Up
the Mill

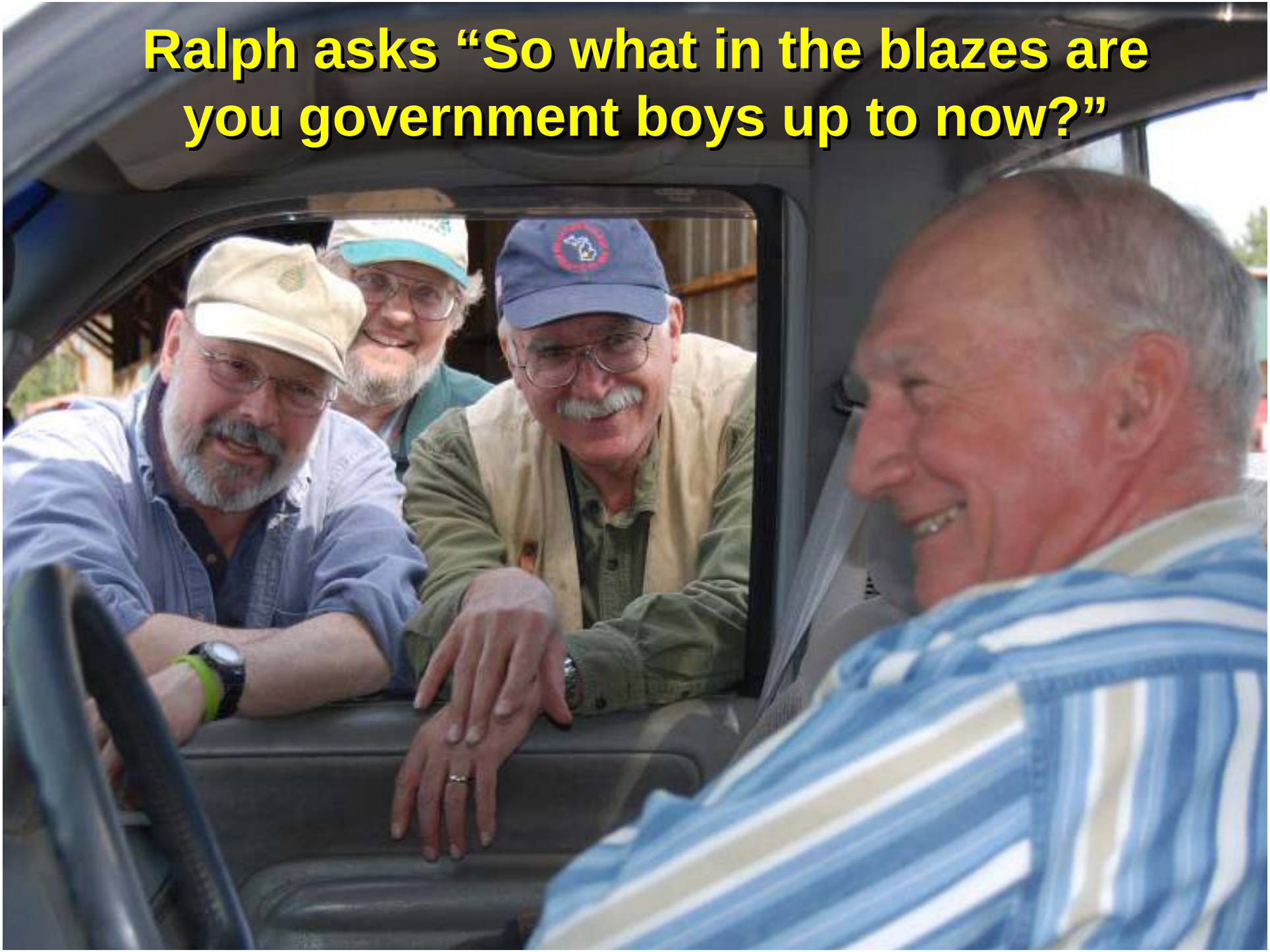


Graphics Courtesy of HewSaw

Saw Arbors with Spacers and Profile Head

Lumber Outfeed


Products Produced
1x4
1x6
2x4
2x6
4x4 (cants)
6x8 (ties)
7x9 (ties)


Ralph asks “So what in the blazes are you government boys up to now?”

Lumber Recovery

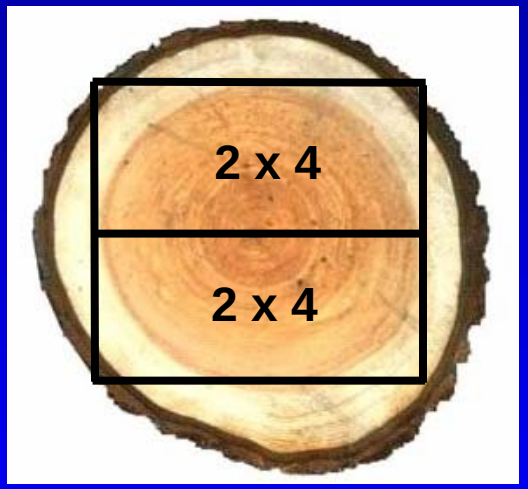
Mill Study Objectives

- Establish the mill's baseline lumber recovery
- Compare sorted vs. unsorted log batches
- Investigate relationship of log diameter and lumber recovery
- How does it compare to computer simulated optimized scan and set recovery—FPL's Best Opening Face (BOF) program

Lumber Recovery

Mill Study #1 – Unsorted 8 ft.

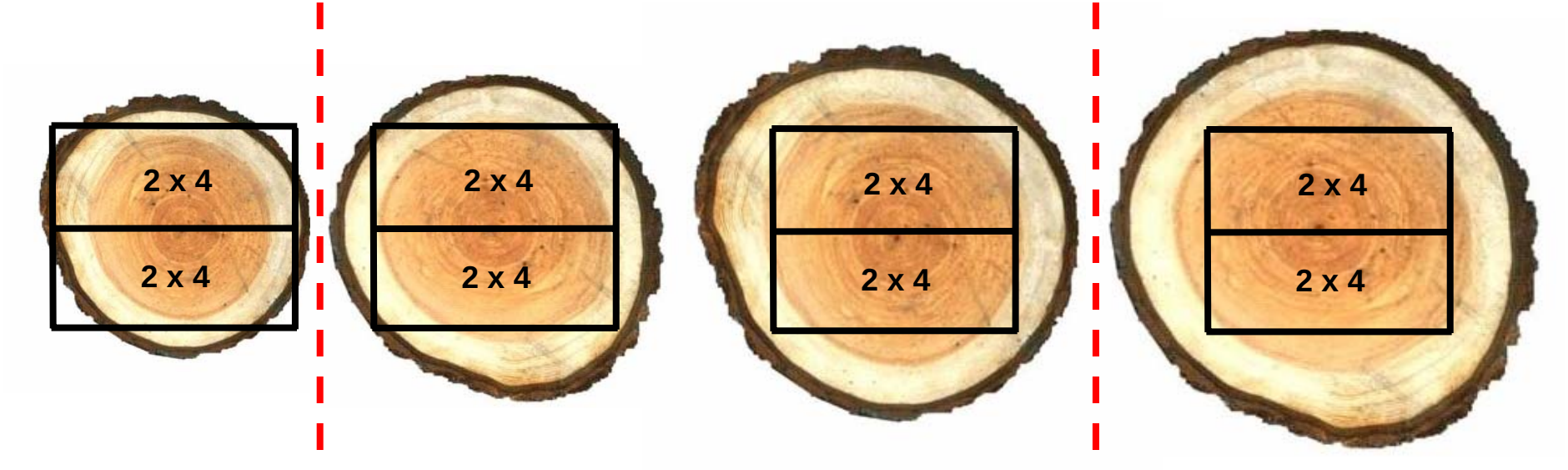
- First thinning red pine plantation material
- Diameter—5 and 6 in.
- Sawing pattern: 2 - 2x4s
- 345 unsorted study logs



- Color coded logs—on spec, below spec and above spec

Lumber Recovery

Mill Study #1 – Unsorted 8 ft. Red Pine



4 in.

Below Spec

5 in.

6 in.

Target

Log Diameter Specification (4.5 to 6.5 in.)

7+ in.

Above Spec

If the logs are too small?

A Few Observations

- Choosing the wrong sawing pattern or miscalculating log weight to volume relationships can be problematic
- Sorting and processing logs in batches by optimal sawing pattern can result in reasonably good lumber recovery
- Details, details, details…

Lumber Recovery

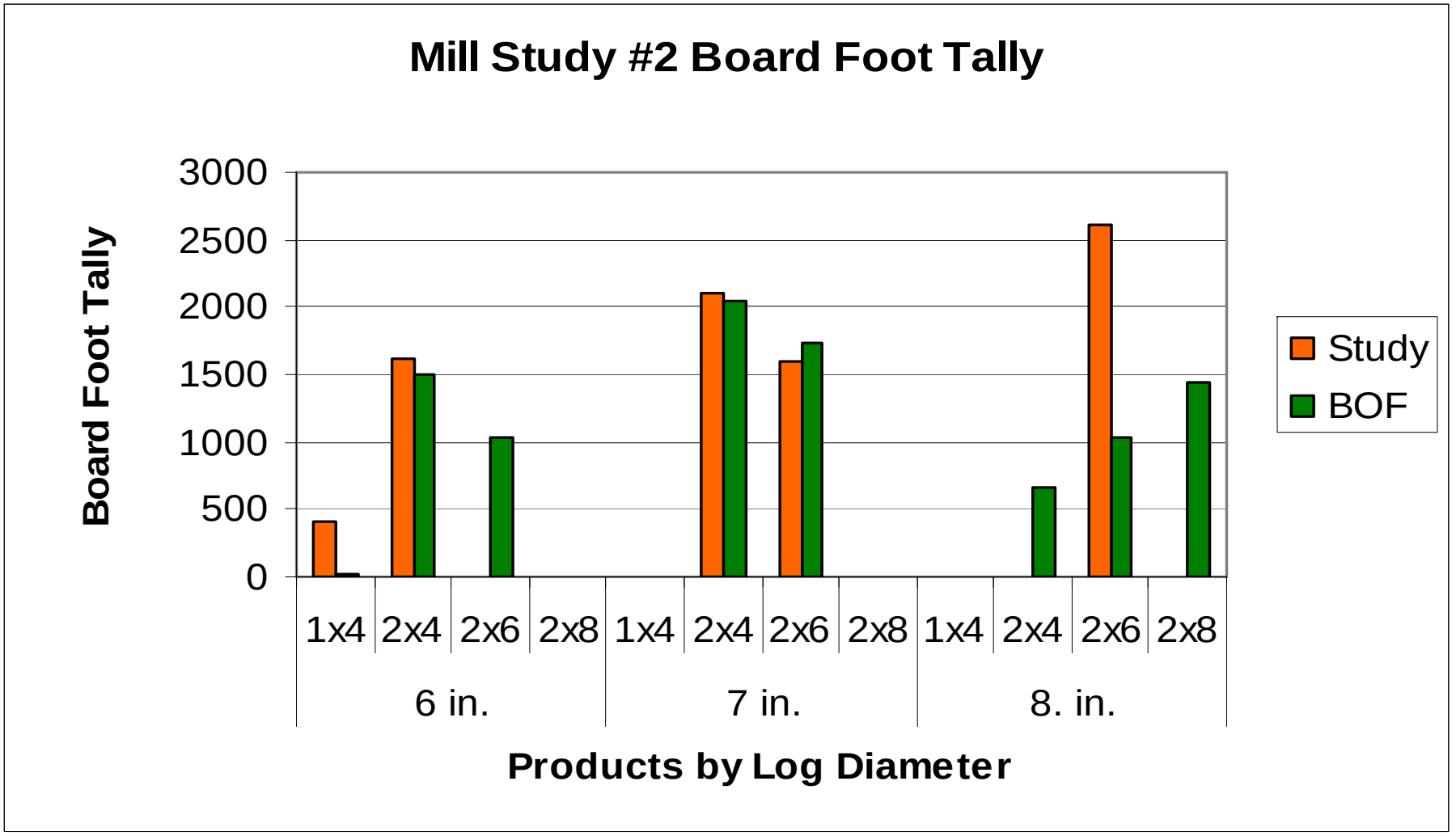
Mill Study #2 – Sorted 12 ft. Red Pine

- Second thinning red pine plantation material
- Diameter range—5.5 to 8.4 in.
- Sawing pattern by 1 in. classes
- 310 study logs
- Color coded, sorted and run as separate batches

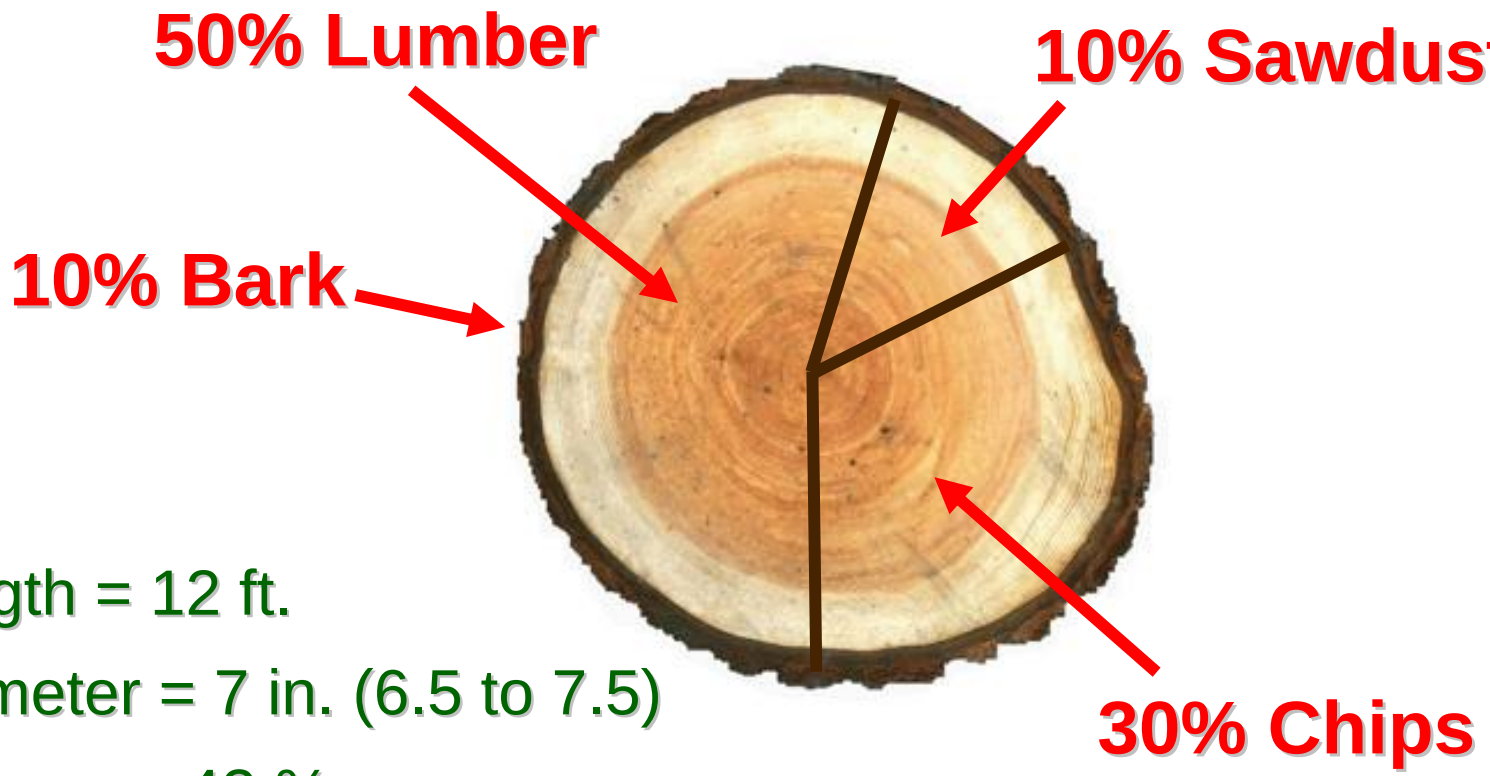

Color-Coded Log Diameter
Classes for Mill Study

Lumber Recovery

Mill Study #2



Estimated Small-Log Lumber Recovery



Length = 12 ft.

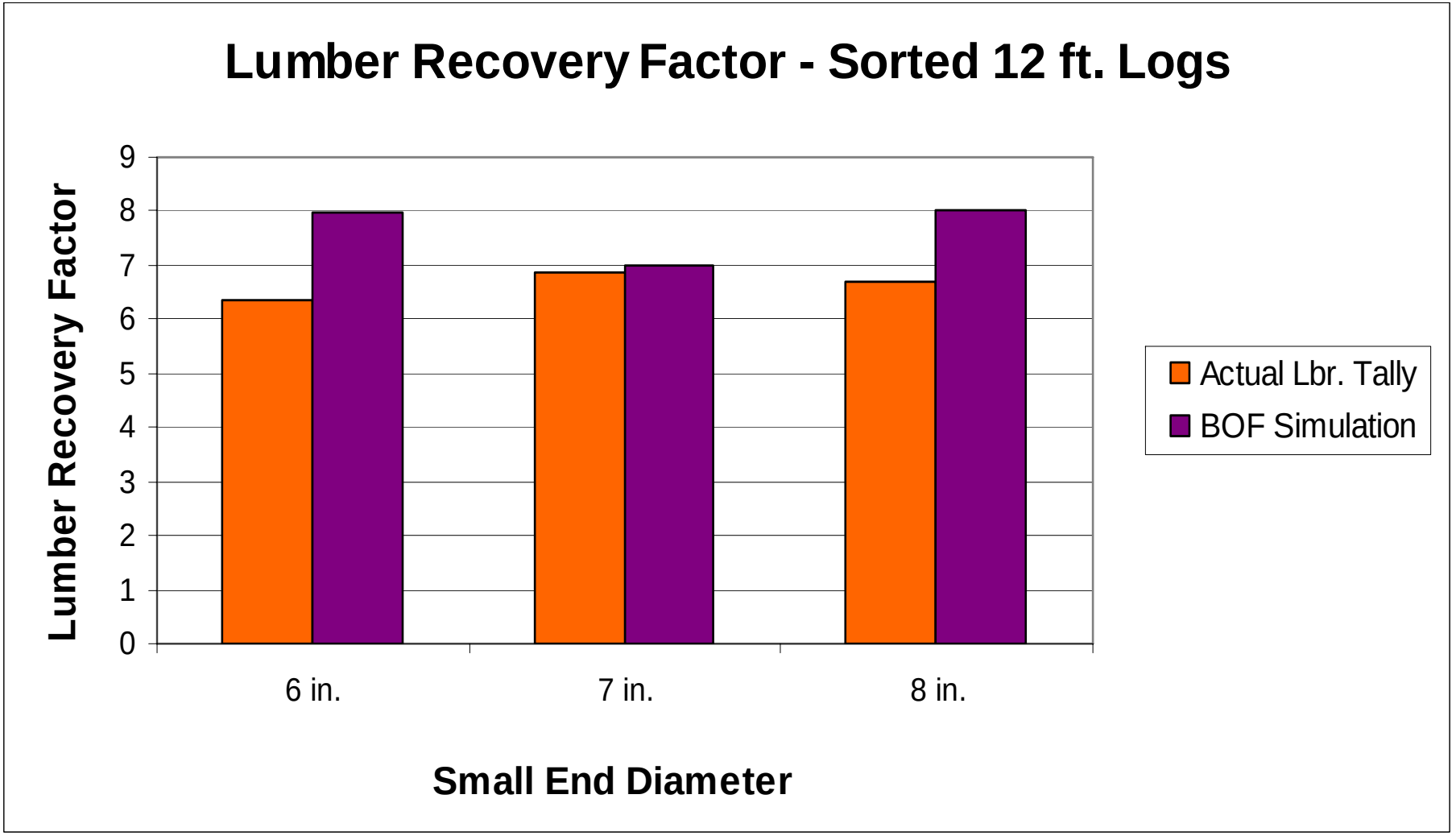
Diameter = 7 in. (6.5 to 7.5)

Overrun = 42 %

LRF = 7.00 (bd.ft. lumber per cu.ft. log)

Lumber Recovery

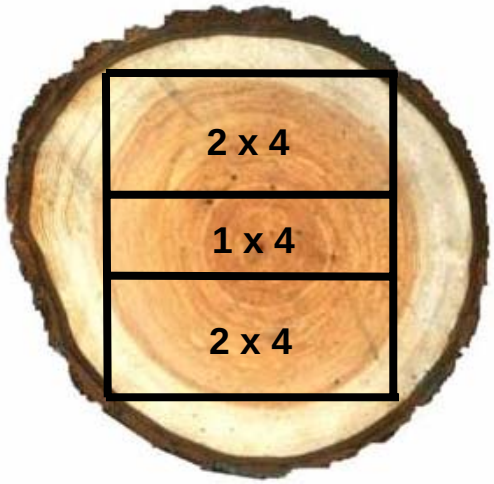
Mill Study #2



Mill Study #2 – Sorted 12 ft. Logs

Sawing Pattern for 6-in. Diameter

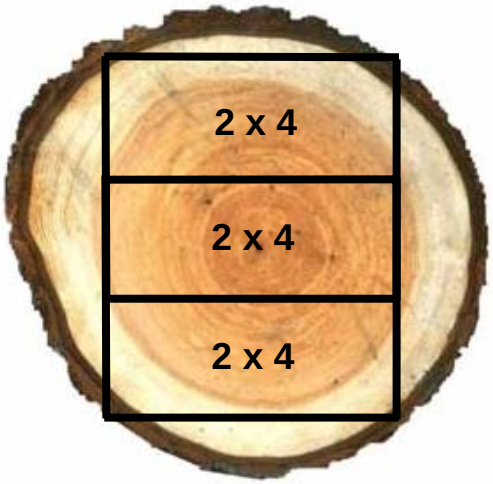
Study



2x4—1x4—2x4

LRF = 6.34

BOF



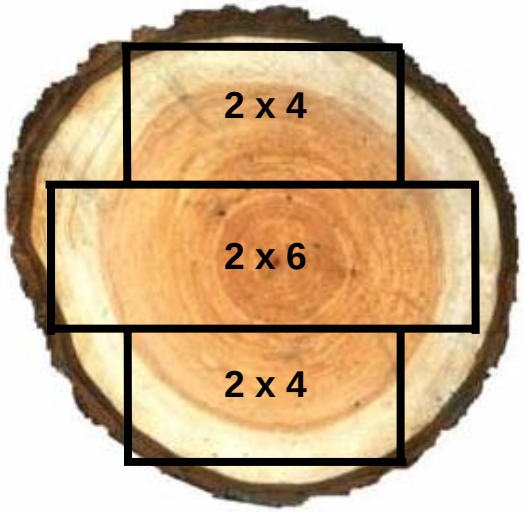
1x4—2x4—1x4
2x4—2x4—2x4
2x4—2x6—2x4

LRF = 7.96

Mill Study #2 – Sorted 12 ft. Logs

Sawing Pattern for 7-in. Diameter

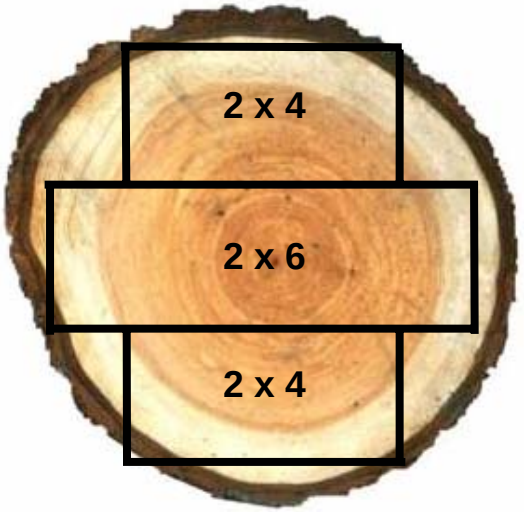
Study



2x4—2x6—2x4

LRF = 6.85

BOF



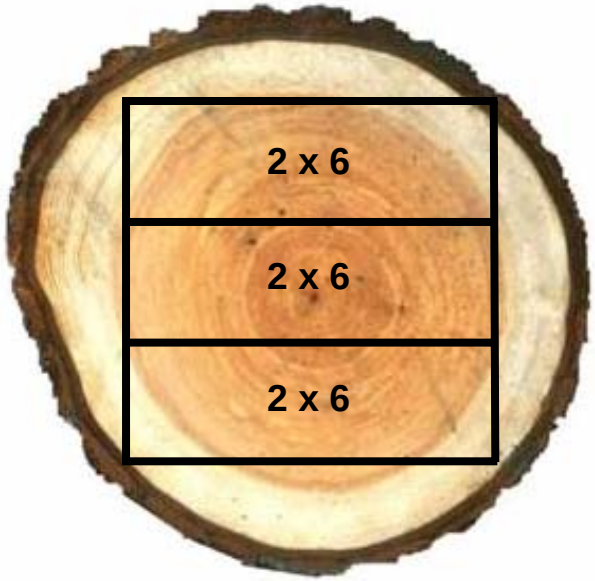
2x4—2x6—2x4
2x6—2x6

LRF = 7.00

Mill Study #2 – Sorted 12 ft. Logs

Sawing Pattern for 8-in. Diameter

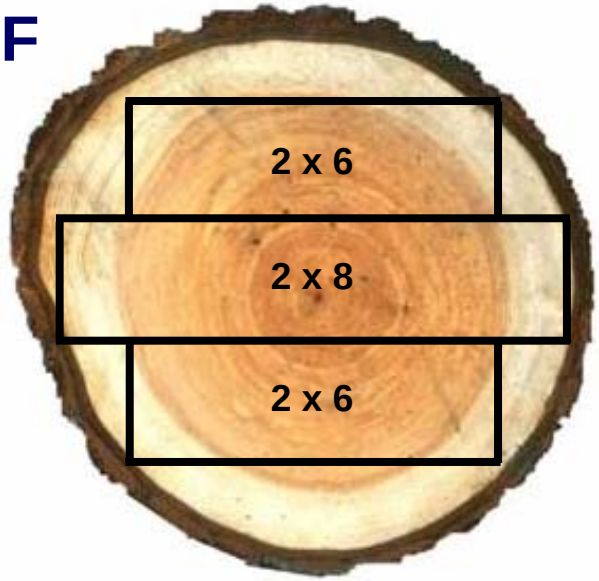
Study



2x6—2x6—2x6

LRF = 6.68

BOF



2x6—2x6—2x6
2x4—2x6—2x6—2x4
2x6—2x8—2x6
2x4—2x8—2x8—2x4

LRF = 8.01

What about lumber grade yield?

Recommendations

Based on Mill Study Results

- Control per unit cost ($/MBF) and improve mill efficiency (lumber recovery)
- Sort and process logs in batches by optimal sawing pattern—reasonably good recovery at lower capital cost
- Log scanning & computer optimized sawing technology—better lumber recovery at lower operating cost


Mobile HewSaw R200SE
presented by
Vaagen
Equipment supplied by
HewSaw

Mobile HewSaw Mill Demonstration

Project Impact

- Better understanding of processing small-log red pine & the Mobile HewSaw's capabilities
- Proof of concept—several potential applications
- Demonstration introduced technology to Wisconsin & stimulated a hardwood sawmill expansion project—investment, jobs

Seven Critical Factors

Forest Products Economic Development

1. Raw material resource
2. Product options
3. Markets & marketing
4. Processing technology
5. Financial
6. Environmental, health & safety
7. Management “know how”

From “Harmony of a Project” Gene Davis, International Resources Unlimited

“Rock Fournier is now going to give you a run down on a followup HewSaw project in Wisconsin.

Happy trails to you until we meet again!”

—Roy Rogers