Hardwood Markets - -
the future offers opportunities and challenges - “housing contraction” - “climate change” - “globalization” - “energy security” - “Asian markets”

Ecological Forestry in Central Appalachians
Elkins, WV
October 22 - 23, 2008

Al Schuler - USDA Forest Service, WV
Urs Buehlmann - VT
(aschuler@fs.fed.us)
Trends Facing U.S. Forest Products Industry

- **Competition** – U.S. is losing market share in many commodity markets

- **Economic activity** –
  1. Domestic housing crises
  2. Center of Economic activity shifting to Asia

- **Fiber & Forestry** -
  1. Convergence of markets for food, fuel, fiber - carbon pricing & biofuel opportunities will impact fiber supply/use/availability
  2. Plantations are growing source of industrial roundwood
  3. Industry forest ownership is being transferred to TIMOS/REITS & others – implications for fiber availability?
  4. Russia, the world’s largest log trader, is increasing log export taxes to encourage domestic production & discourage illegal logging –
  5. Asia’s wood deficit – will drive U.S. log (and lumber) exports
  6. **Future wood and forest product prices will trend upward?**
Globalization

Single world market for labor, capital, goods, and services
Significance - distance is less of an obstacle to competing
The challenge – develop a relevant competitive strategy
“what you do better than anyone else”

The World Is Flat
A BRIEF HISTORY OF THE TWENTY-FIRST CENTURY
Thomas L. Friedman
In 1956, it cost $5.86/ton to load and unload a cargo ship by hand – today, using containers, it cost 16 cents/ton – today’s cost < 3% of 1956

Railroads can move a ton of freight 423 miles
On a single gallon of gas
Competition – U.S. losing Market Share in Many Forest Product Markets
Secondary Industry - hardwood market trends – implications for rest of supply chain – lumber industry and landowners?

U.S. Import Market Shares

*These market shares are conservative because some imported components is included in the domestic shipments

Consumption = shipments + imports – exports. Import share = imports/consumption

Source: Census, ASM; ITA (www.ita.doc.gov)
Wood Household Furniture Shipments vs Imports

Million 1982$

Shipments – Census ASM (http://www.census.gov/mcd/asmhome.html); Imports – ITA (http://www.ita.doc.gov/td/ocg/imptab.htm)
Employment Trends

- Furniture includes kitchen cabinets and all types of furniture – NAICS 337
- Wood products (hwd & sft) includes lumber, veneer, millwork, windows & doors, containers & pallets, & mobile homes - NAICS 321

Source: BLS
http://data.bls.gov/cgi-bin/srgate
U.S. Hardwood Flooring Imports

Housing’s Impact is Huge

Customs value (million $)

2007

Imports $143 million
Exports 92 million
Deficit $51 million

World Imports
Imports from China

Source: USDA, FAS
Hardwood Lumber Consumption
as lumber consumption falls, domestic demand for logs drops too (as does price?)

Source: HMR – the year at a glance
U.S. Graded Hardwood Lumber Consumption Trends (BBF)

Total consumption up 800 MMBF between 1962 and 2007 - - 17%  
But dramatic changes in where the lumber is consumed

Source: Bill Luppold, USDA
Changes in U.S. Graded Hardwood Lumber Consumption Trends over the past four decades (1962 – 2007)
Hardwood Lumber Consumption by Wood Household Furniture versus Kitchen Cabinet

![Graph showing hardwood lumber consumption over time for household furniture and kitchen cabinets.](image_url)

- **Millions of board feet**
- **Data Source:** Bill Luppold
### Markets for HW Components

<table>
<thead>
<tr>
<th></th>
<th>1984</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furniture</td>
<td>65%</td>
<td>22%</td>
</tr>
<tr>
<td>Cabinetry</td>
<td>16%</td>
<td>27%</td>
</tr>
<tr>
<td>Building Products *</td>
<td>10%</td>
<td>42%</td>
</tr>
<tr>
<td>Decorative/Specialty</td>
<td>4%</td>
<td>7%</td>
</tr>
<tr>
<td>Industrial Products</td>
<td>5%</td>
<td>3%</td>
</tr>
</tbody>
</table>

*residential and commercial, both new construction and remodeling*

Source: 2008 WCMA Market Study
U.S. Forest Products Trade Imbalance

Billion $

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
<th>Deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1982</td>
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<td></td>
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<tr>
<td>1984</td>
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<td>1986</td>
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<td></td>
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<td>1988</td>
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<td>1990</td>
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<td>1992</td>
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<td>2000</td>
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<td>2002</td>
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<td></td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2006

Imports  $31.5 billion
Exports  18.5 billion
Deficit  $13.0 billion

Source: FAO STAT
The U.S. Trade Dilemma...

We are exporting raw materials and importing finished goods…
The U.S. is a major exporter of hardwood lumber and logs…
And we are the major importer of finished hardwood products like furniture, flooring, molding & millwork …

This needs to change if the U.S. secondary hardwood processing industry is to survive – think about it - what happens to the primary industry if the secondary industry keeps shrinking???? What happens to domestic log markets? Exports can’t take up all of the slack because the U.S. has lots of competition in international log and lumber markets
Fiber & Forestry Issues will impact future wood prices & availability

- Timberland ownership changes – impact on future log supply and sustainable forestry??
- Russian log export tax to increase dramatically by 2009 – impacts 40% (softwoods) and 30% (hardwoods) global log trade
- Convergence of markets for food, fuel, and fiber; and pricing of carbon – bioenergy – carbon trading markets – future fiber shortages?
- Certification and green building trends
U.S. Industrial Hardwood Roundwood* Usage will change

biofuels? - green building? ecosystem markets?

Billion cubic feet

- 1990
- 1995
- 2000
- 2004

Hardwood Pulp Industry  Hardwood Lumber  OSB

Sources: Forest Resources Assoc., APA, USDA Forest Service

* Pulp industry totals exclude residue chips, but include whole tree chips
Annual area of U.S. Timberland Transactions - Impact on future fiber availability?

Source: Timber trends, The Campbell Group
# U.S. Timberland Ownership by Integrated* Companies (000 acres)

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LP</td>
<td>945</td>
<td>945</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boise Cascade</td>
<td>2,340</td>
<td>2,340</td>
<td>2,240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bowater</td>
<td>1,800</td>
<td>490</td>
<td>370</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>MeadWestvaco</td>
<td>3,400</td>
<td>3,140</td>
<td>2,150</td>
<td>1,118</td>
<td>&lt;1000?</td>
</tr>
<tr>
<td>Temple-Inland</td>
<td>2,200</td>
<td>2,200</td>
<td>2,050</td>
<td>1,990</td>
<td>0</td>
</tr>
<tr>
<td>IP</td>
<td>12,025</td>
<td>9,185</td>
<td>6,800</td>
<td>600</td>
<td>200</td>
</tr>
<tr>
<td>Potlatch</td>
<td>1,545</td>
<td>1,150</td>
<td>1,455</td>
<td>1,460</td>
<td>1,500</td>
</tr>
<tr>
<td>Rayonier</td>
<td>2,100</td>
<td>2,050</td>
<td>2,030</td>
<td>2,180</td>
<td>2,400</td>
</tr>
<tr>
<td>Weyerhaeuser</td>
<td>5,700</td>
<td>7,300</td>
<td>6,400</td>
<td>5,640</td>
<td>5,640</td>
</tr>
<tr>
<td>GP’s Timber Co.*</td>
<td>4,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>36,055</strong></td>
<td><strong>28,800</strong></td>
<td><strong>23,495</strong></td>
<td><strong>13,238</strong></td>
<td>~10,000</td>
</tr>
</tbody>
</table>

* I included GP’s Timber Co. as an integrated Co. (A. Schuler – USDA)
**Structural change in international log markets**

(1) Russia is world’s largest exporter (volume basis) of both hardwood and softwood logs
   - Softwoods - about 40%
   - Hardwoods – about 30%
(2) Softwood tax increases from 6.5% (2007) to 80% by Jan 2009
(3) Hardwood sawlogs (Oak, Beech, Ash) tax increases from 20% (2007) to 40% by Jan 2009

**News Release**
Russia’s Scheduled 80% Log Export Tax will reduce log exports, disrupt global forest products trade flows and create a supply shortage in China.
   - Higher prices and increased demand will create substantial opportunities in logs, lumber, pulp and other products for a variety of exporting countries to China and other Asian countries.

For Immediate Release October 16, 2008
Vancouver, B.C.
Through June, 2008, Russian log exports are up 42% ( $ basis)
And flat (volume basis) – so far, the duty is not slowing exports!!

Source: Global Trade Atlas
Russian Export Trends - Temperate Hardwood Logs

Finland and Sweden import pulpwood
China imports more sawlogs

Source: GTA
Hardwood and Softwood Logs

RUSSIAN LOG EXPORTS
BY MAJOR COUNTRY

Million m³

Other
China
Japan
Finland

New opportunities or more competition for fiber? - - “climate change”; energy security; and an expanding population

- Climate change - - - brings new regulations & shifts in consumer behavior
  - Bio fuels markets
  - Carbon trading –
  - Green building programs
  - Substituting wood products for non wood products
  - Ecosystems market approach for non market values – biodiversity; conservation; nutrient cycling; climate regulation; outdoor recreation; ....

Energy security, climate change, globalization, and expanding population all have the potential for increasing the value of our hardwood forests – will mean more competition for wood fiber and some fiber prices will increase.
U.S., Europe, and China are the biggest “polluters” of carbon emissions

Source: the Economist  Sept 11, 2008
Carbon Trading Markets
Opportunity for U.S. Landowners - maybe

Carbon trading is a market based mechanism for bringing buyers and sellers of carbon credits together

How Forest landowners Benefit – the theory

Landowner accumulate carbon credits by growing trees because trees store carbon
These credits can, potentially be sold, presumably to polluting industries – steel, aluminum manufacturing, power generating facilities,....

Status of carbon trading – well along in Europe, but just talking here in North America & not talking in China
Oil Prices

Monthly, $/barrel – West Texas Intermediate

Source: (www.economagic.com)

Total = 101.605 Quadrillion
Total = 6.830 Quadrillion Btu

Petroleum 40%
Nuclear Electric Power 8%
Natural Gas 23%
Coal 22%
Renewable Energy 7%

Solar Energy 1%
Hydroelectric 36%
Geothermal Energy 5%
Biomass 53%
Wind Energy 5%

Source: EIA (http://www.eia.doe.gov/neic/aboutEIA/aboutus.html)
Biofuels markets

Figure 1. — Past and projected global production of biofuels, 2003-2017.

Source: Clean Edge, Inc. (2008)
Wood Pellet Market Growth

Million tonnes production

Relative value of one cubic meter of wood as lumber, paper, pellets, and ethanol – these values will change as markets change!!!

<table>
<thead>
<tr>
<th></th>
<th>Yield</th>
<th>Value (m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Framing Lumber</td>
<td>80</td>
<td>$81</td>
</tr>
<tr>
<td>Paper</td>
<td>45</td>
<td>$100-150</td>
</tr>
<tr>
<td>Pellets</td>
<td>90+</td>
<td>$70</td>
</tr>
<tr>
<td>Ethanol</td>
<td>25</td>
<td>$75</td>
</tr>
</tbody>
</table>

Table 1. — Comparison of relative value of one cubic meter of wood as lumber, paper or energy products when nom. 2- by 4-inch (38- by 89-mm) by 2.4-m is valued at $250/1000 bf, paper at $650-$975/ton, wood pellets at $240/ton and ethanol at $3.00 per gallon as of April 2008.

Source: FPJ, Winandy, et.al. June 2008
Green Building Trends

Interest in Green building increases with standard of living – with globalization, incomes in India, China, .... will increase

• Energy efficiency - Indoor air quality - Water efficiency - Resource efficiency
• Market for “green homes” is expected to increase from $2 billion To $20 billion over the next five years in the USA
• **Implications** - World Market for green products will grow as world living standards improve – drives demand for wood products
IV. Globalization - Economic Activity Shifting to Asia – creates export opportunities for U.S. Hardwood industry (if we’re competitive)

Asia’s growing wood deficit
Globalization and hardwood log/lumber trade flows
GDP at Market Exchange Rates and PPP Billion US$ - Impact on Wood Products?

PPP* - exchange rates adjusted to equalize cost of goods in different countries

Source: IMF
Lots of potential to export more wood products to China
Affluent population today ~13 million ~$40,000 income (PPP)
By 2011, lower middle class ~ 290 million people with income ~ $16,000
By 2025, upper middle class ~ 520 million people ~ $25,000

Per Capita Wood Consumption

Source: China Timber Import Export Co/Hardwoodmarkets.com 2003
China’s rank in wood products global trade:

<table>
<thead>
<tr>
<th>Production</th>
<th>Global Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plywood</td>
<td>#1</td>
</tr>
<tr>
<td>MDF</td>
<td>#1</td>
</tr>
<tr>
<td>Blockboard</td>
<td>#1</td>
</tr>
<tr>
<td>Furniture</td>
<td>#2</td>
</tr>
<tr>
<td>Hardwood lumber</td>
<td>#2</td>
</tr>
<tr>
<td>Particleboard</td>
<td>#3</td>
</tr>
<tr>
<td>Softwood lumber</td>
<td>#4 (higher than Sweden)</td>
</tr>
<tr>
<td>Finished Products</td>
<td>Soaring</td>
</tr>
</tbody>
</table>

- Imports                        | #2 (after the USA)               |
- Exports                         | #1                               |

Source: Mike Snow, AHEC
But, China Needs Fiber

NFCP – national forest conservation plan implemented in 1999 following the Yangtze river flooding (damage intensified by deforestation)

China Domestic Timber Output Under NFCP

Cubic meters

Source: China Timber Import Export Co/IFSA Consulting
Plantations contribution to global industrial* wood Production Is approaching 50% according to FAO
What are implications for U.S. hardwood forests?

<table>
<thead>
<tr>
<th>Country</th>
<th>Total</th>
<th>Productive</th>
<th>Protective</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>71,326</td>
<td>54,102</td>
<td>17,224</td>
</tr>
<tr>
<td>India</td>
<td>30,028</td>
<td>17,134</td>
<td>12,894</td>
</tr>
<tr>
<td>United States of America</td>
<td>17,061</td>
<td>17,061</td>
<td>0</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>16,963</td>
<td>11,888</td>
<td>5,075</td>
</tr>
<tr>
<td>Japan</td>
<td>10,321</td>
<td>0</td>
<td>10,321</td>
</tr>
<tr>
<td>Sweden</td>
<td>9,964</td>
<td>9,964</td>
<td>0</td>
</tr>
<tr>
<td>Poland</td>
<td>8,757</td>
<td>5,616</td>
<td>3,141</td>
</tr>
<tr>
<td>Sudan</td>
<td>6,619</td>
<td>5,677</td>
<td>943</td>
</tr>
<tr>
<td>Brazil</td>
<td>5,384</td>
<td>5,384</td>
<td>0</td>
</tr>
<tr>
<td>Finland</td>
<td>5,270</td>
<td>5,270</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>181,693</strong></td>
<td><strong>132,095</strong></td>
<td><strong>49,597</strong></td>
</tr>
</tbody>
</table>

* Excludes firewood

U.S. Hardwood Lumber Exports

Source: FAS
China’s Hardwood Lumber Imports

Million $  

2001 2002 2003 2004 2005 2006 2007

0 200 400 600 800 1,000 1,200 1,400

Source: Global Trade Atlas
China’s Hardwood Log Imports

In 2007 - -
25 % of temperate logs sourced from Russia
7 % from USA

Source: GTA
Housing markets and hardwoods
Housing Cycles – they have been with us for decades

Source: NAHB
Prices and incomes must trend together
- when price exceeds ability to pay (incomes)
prices must come down

Sources: NAHB & NAR – Home prices; U.S. Census – family income
Ratio median home prices to median family income

- normal PE’s: existing homes – 2.5
- new homes – 3.0

Source: Price – NAHB; family income - Census
New Home Inventory

Months supply

August – 10.9 months

Source: U.S. Census Bureau, New Residential Sales, CB06, Table 1.
Housing Starts & Prices

Price Index:
% Change
One year ago.

Starts off 62% from peak

Prices off 21% from peak

Single-Family Starts

Home Price Index

### Housing Forecasts – Single family plus multi family

---

- most analysts believe 2010 is the beginning of a recovery –

<table>
<thead>
<tr>
<th>Source</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natl. Assn. Realtors (Oct. ’08)</td>
<td>.97</td>
<td>.84</td>
<td>.99</td>
</tr>
<tr>
<td>NAHB (Sept. ’08)</td>
<td>.95</td>
<td>.81</td>
<td>1.01</td>
</tr>
<tr>
<td>APA (Aug. ’08)</td>
<td>.91</td>
<td>.88</td>
<td>1.14</td>
</tr>
<tr>
<td>Economy.com (Oct. ’08)</td>
<td>1.00</td>
<td>.90</td>
<td>?</td>
</tr>
<tr>
<td>Freddie Mac (Aug. ’08)</td>
<td>.97</td>
<td>1.07</td>
<td>1.17</td>
</tr>
<tr>
<td>RISI (July ’08)</td>
<td>1.00</td>
<td>1.16</td>
<td>1.55</td>
</tr>
</tbody>
</table>

Average for 2008: .970 million

Average for 2009: .940 million

Average for 2010: 1.17 million
Housing Demand Drivers - this decade could be better than the last

Million per year

Harvard JCHR outlook (Nov 2007)


Household Growth  Vacant Unit Demand  Net Removals
House Prices – RTC vs Today’s Subprime Problems

YOY percent change
Case Shiller 10 city average

RTC – Oct 89

Today - Subprime Credit crunch

"89" "90" "91" "92" "93" "94" "95" "96" "97" "98" "99" "00" "01" "02" "03" "04" "05" "06" "07" "08"
Housing and Wood Product Markets – strong linkages

HMR Business Activity Snapshot™

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>+2.8%</td>
</tr>
<tr>
<td>Housing Starts (Sales $)</td>
<td>-30.5%</td>
</tr>
<tr>
<td>Cabinet (Sales $)</td>
<td>-15.8%</td>
</tr>
<tr>
<td>Furniture (Sales $)</td>
<td>-13.1%</td>
</tr>
<tr>
<td>Flooring Shipments (Volume)</td>
<td>-13.2%</td>
</tr>
<tr>
<td>Lumber Exports (Volume)</td>
<td>-14.9%</td>
</tr>
<tr>
<td>Crossties (Inventories)</td>
<td>-9.8%</td>
</tr>
<tr>
<td>Sawmill Production</td>
<td>-21.9%</td>
</tr>
</tbody>
</table>

Source: HMR Executive, October 2008
65 fewer sawmills operating in WV today versus 2 years ago – weak housing & fewer exports are culprits – Sept 2008

State News

State’s timber industry taking a beating from housing, import declines
by Justin D. Anderson
Daily Mail Capitol Reporter

CHARLESTON, W.Va. -- Sawmill operators are telling state Forester Randy Dye these are some of the worst times in recent memory for the state’s $4 billion timber business.

“When the market turned, it turned very quickly downward,” Dye said. “It kind of caught people by surprise.”

There are about 65 fewer sawmills running in West Virginia today than there were only two years ago, according to the state Division of Forestry. The most recent count was about 127.

And those mills still operating are finding it hard to find skilled loggers - who are shifting to the more lucrative coal, gas and oil jobs, Dye said.

Certified loggers in the state declined from 1,141 in 2004 to 932 this year. That’s a five-year low.
WV Hardwood Stumpage Prices

Source: WVU AHC
Ohio Stumpage Prices

Semi annual, $/M, Doyle

U.S. Housing market – flooring and cabinets

Export markets

Source: Ohio Dept Natural Resources
Strong export markets drive pallet cant demand
Weak Housing = weaker cabinet & flooring demand
Which Drive KD red oak prices lower

Source: Hardwood Market Report
The Importance of Sound Strategic Planning

Toyota Prius sales pass Ford Explorer in US in 2007

Toyota saw higher gasoline prices – Ford & GM had access To the same information, but drew the wrong conclusions

What trend, already out there, will impact wood use
Over the next decade?? – Green Building - - Certification –
Russian log export tax?
Climate change? – Wood based Biofuels? –

How can your business benefit?? How can you mitigate problems
Concluding thoughts

- Globalization factors forcing U.S. to “rethink competitive strategies” as U.S. secondary industry loses market share

- Future fiber prices to increase
  - convergence of markets for fuel, fiber, and other forest products
  - structural changes in world log markets as Russia hikes export tariffs
  - forest ownership transfers
  - Asia’s growing wood deficit

- Center of Economic activity moving to Asia

- Housing crisis impacts hardwood industry

Best strategy for future - Do what you can do better than anyone else!!!!!