

Montana's Forest Biomass Supply

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Montana Bioenergy Workshop

thank: Angela Farr and others that organized this workshop

Today I hope to communicate results from **analysis & report I conducted for DNRC:**
20-pages

Data are from FIA Program & BBER's research on forest products industry

- 1) What the current level of woody biomass consumption in Montana is
- 2) What the forest-based woody biomass supply in Montana is
- 3) What fraction of that supply is potentially "available"
- 4) What I see as the key difficulty of developing a woody biomass industry in Montana

Bottom Line Up Front

Woody biomass supply is NOT the issue!

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Supply is NOT the issue!

As I'll show, there is more than adequate supply.

A point worth repeating...

Why is supply NOT the issue?

Because we have so much of it, but it doesn't seem to matter!

Finally...

Availability of that supply, **access** to that supply,

SOCIAL– economic, LEGAL, & POLITICAL-- constraints are the issue.

Montana's Timber Harvest & Forest Products Industry

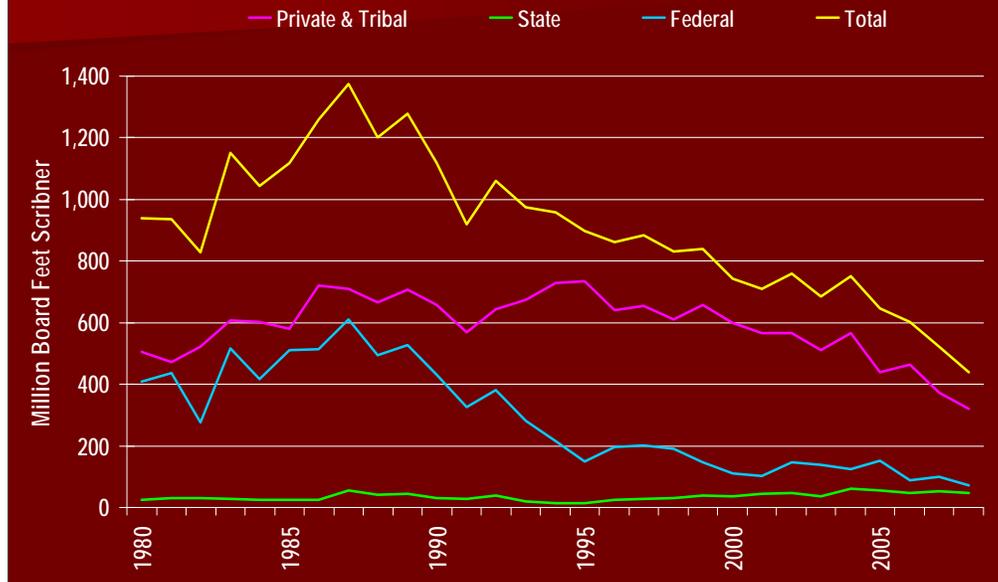


Let's take a few moments to look at
Timber harvest and the Forest Products Industry in Montana.

This will help provide some perspective on the issue of woody biomass supply and
use

As well as a glimpse of what a biomass industry that wants to use wood will be
facing in Montana

Montana Annual Timber Harvest 1980-2008



A little history:

Total timber harvest in MT has decreased by 68 percent **between 1987 and 2008, driven by.**

Harvest from federal lands in Montana declining 88 percent over that period.

The declines in federal harvest resulted from appeals and litigation of timber sales, increased efforts to protect threatened and endangered species, cumulative impacts of historic logging and road building, and budget cuts.

Since 1995, NFS harvests have stayed low—below 200 MMBF ('06 - '08 below 100 MMBF)

And since 1995, there has been a steady decline in the private harvest, which has intensified in recent years.

Montana's Timber Resource Non-reserved Timberlands 2003-2007

| | |
|-----------------------|-------------|
| Growing stock volume | 36,733 MMCF |
| Annual (gross) growth | 862 |
| Annual mortality | 456 |
| Annual harvest (2004) | 198 |
| (2007) | ~132 |
| (2008) | ~116 |

Why is supply not an issue?

Harvest decline is NOT because we are RUNNING OUT OF TIMBER

These figures are for growing stock (dbh > 5") just on timberland (excludes Wilderness, Nat. Parks, and "non-forest" use land)

As this slide indicates: almost **37 billion cubic feet standing volume**

Harvest = 0.3% to 0.5% of standing volume per year

Statewide **gross GROWTH EXCEEDS REMOVALS by 4:1 (2004) to 7.4:1 (2008)**

growth minus mortality = **net growth = 406 million = 2 to 3.5 times removals**
AND MORTALITY is **2 to 4 times** removals

Should care because of forest (ecology and health) issues – insects, disease, wildfire, drought

Also economic/social issues:

Worth mentioning here, while in cubic, given current mix of timber products harvested--
each 1 MMCF of timber harvested in MT translates into about 42 full-time equivalent (FTE) workers directly employed in the forest products industry.

Includes logging, timber-using mills, and facilities that use mill residuals, and does not include fed or state agency employment.

Believe the multiplier effect is an additional 1 to **1.5 workers in indirect and induced for each direct worker**

Montana's Timber Resource Non-reserved Timberlands 2003-2007

| | | <u>Public</u> | <u>Private</u> |
|------|-------------------------|---------------|----------------|
| 2007 | Net Growth (MMCF/yr) | 268 | 137 |
| | Removals (MMCF) | 36 | 96 |
| | Ratio | 7.5 : 1 | 1.4 : 1 |

Sources: Miles & Hansen, Fri, Aug 1, 2008: Forest Inventory EVALIDator web-application version 1.0 <http://199.128.173.26/evalidator/tmattribute.jsp>

Public vs. private comparison

Net GROWTH EXCEEDS REMOVALS on PUBLIC timberlands by MORE THAN 7:1 (2007 harvest levels)

MORTALITY on public lands is 417 MMCF/yr = 11.6 times harvest!

So harvest decline is NOT an INVENTORY or GROWTH & REMOVALS issue on public lands

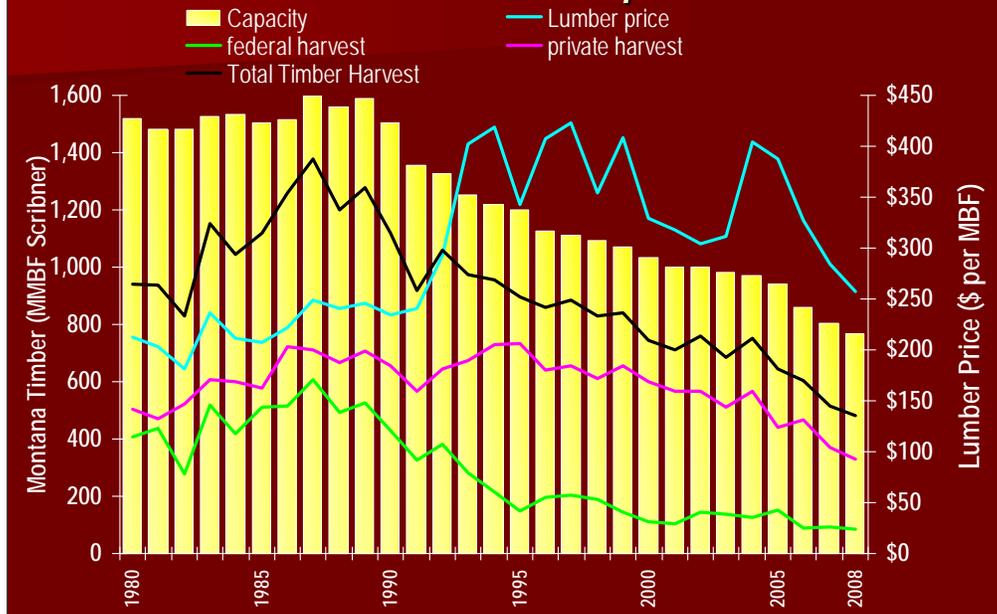
Which account for more than 65% of non-reserved timberland in MT

The harvest decline on private lands may be a different story, the very recent decline is likely a combination of market forces and inventory

In 2004 G:R was < 1 on private lands

ON to Montana's forest products industry...

Montana Timber-Processing Capacity & U.S. Lumber Prices, 1980-2008



INDUSTRY CAPACITY TO PROCESS TIMBER

MEASURED THIS WAY, SEE a 50% decline in capacity to process timber (yellow bars) in MT since late 1980s

FROM ABOUT 1.6 BBF ANNUALLY to less than 800 MMBF IN 2008

The decline in federal timber harvest (green line) led to Montana's reduced milling capacity during the 1990s

a period with high but volatile product prices (blue line).

This is not just true for Montana,

It happened--to a greater extent--in AZ, CO, NM, UT, WY--states where federal lands historically provided larger share of the harvest.

The loss of MT's milling infrastructure in the 1990s was

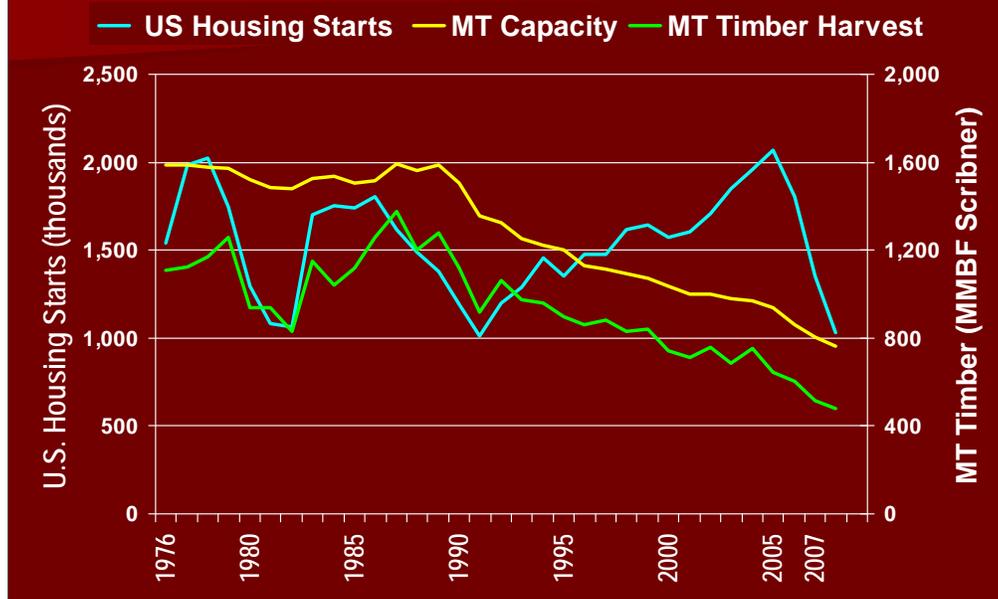
due to declines in federal timber offerings, and has been followed by further harvest declines driven by continued low levels of a federal timber sales, a fall-off in private harvest, and **most recently by poor markets.**

Timber supply is not the only reason MILLS CLOSE but it was the **driving factor in MT during the 1990s**

right now housing/lumber markets are KEY issues.

US Housing & MT Wood, 1976-2008

Sources: U.S. Census Bureau; BBER



Montana's longer-term capacity issues are more closely related to **timber availability** and **harvest levels** in the state than to the broader **US housing** and **lumber markets**.

Throughout the 1990s, as housing starts were rising (blue line), timber-processing capacity in Montana was declining (yellow) just as timber harvest in the state (green) was declining.

The recent steep decline in housing has begun to impact private harvest and milling capacity in the state, and the current instability in the liquidity/lending and stock markets are further complicating things.

The real question is: what will happen to harvest and capacity in the state once markets begin to stabilize and rebound?

Timber availability will play a large role in **Montana's forest products industry's** ability to stabilize, recover, and remain **viable in the future**. Without an increase in timber availability, the industry will have great difficulty responding to improving market conditions, capitalizing on new/emerging markets like biomass power, and carbon sequestration credits.

This could seriously hurt private landowners, agencies, and the PUBLIC that need/want actively managed lands.

So, **back to woody biomass...**

Forest Biomass Terminology

- **Timberland**
 - **Live tree woody biomass**
 - **Standing dead tree woody biomass**
- **Logging residue**
- **Mill residue**

Timberland – NOT reserved (e.g., National Parks, Wilderness), productive (i.e., >20 cuft/ac/year), source of current harvest

Live tree woody biomass – NOT leaves or needles

Standing dead tree woody biomass – NOT logs, limbs, leaves, or needles on the forest floor

Logging residue – material left in woods/landing, NOT used, usually burned as slash

Mill residue – bark, sawdust, slabs, edging, trim left over from processing logs into primary product

Montana Forest-based Woody Biomass

- **Current use: < 3 million dry tons (MDT) per year**
 - **More than 50 % used by one facility**
 - **Less than 50 % comes from in-state mill residue**

There are about **20 biomass users in Montana:**

11 Fuels for Schools

10 bark or wood pellet plants

3 board facilities (MDF, particleboard, & linerboard)

Currently **use about 2.2 to 2.7 MDT (million dry tons) per year**

more than 50% used by one facility

less than 50% of biomass material comes from in-state mill residue

other sources:

Montana Forest-based Woody Biomass

- Logging residue: < 0.6 MDT per year
 - Amount produced is declining
- Mill residue: < 1.5 MDT per year
 - More than 99 % already used
 - Amount produced is declining

Logging residue < 0.6 MDT per year, and decreasing as harvest declines.

Mill residue (as I mentioned already) < 1.5 MDT per year

over 99% of mill residue already used by biomass & traditional wood products industry in MT

Amount is also declining as harvest declines.

So, not enough material from these sources to support current biomass users.

Biomass users are already using live & standing dead trees to supplement mill residue.

Montana Forest-based Woody Biomass

- **Timberland: 20 million acres**
 - **61 % in national forests**
 - **Live trees: 725 MDT**
 - **74 % in national forests**
 - **Dead trees: 136 MDT**
 - **85 % in national forests**

FIA inventory data:

20 million acres of non-reserved timberland

61% in national forests

On those 20 million acres, more than 850 MDT of woody biomass

Live trees = 725 MDT (74%in national forest)

Standing dead trees = 136 MDT (85% in national forests)

This is why AVAILABILITY is the issue!

Montana Forest-based Woody Biomass

Filtered forest inventory:

- Stands within ½ mile of a road
- Stand ages of 0 to 100 years
- Slope of 0 to 40 %
- Tree dbh of 5.0 to 10.9 inches

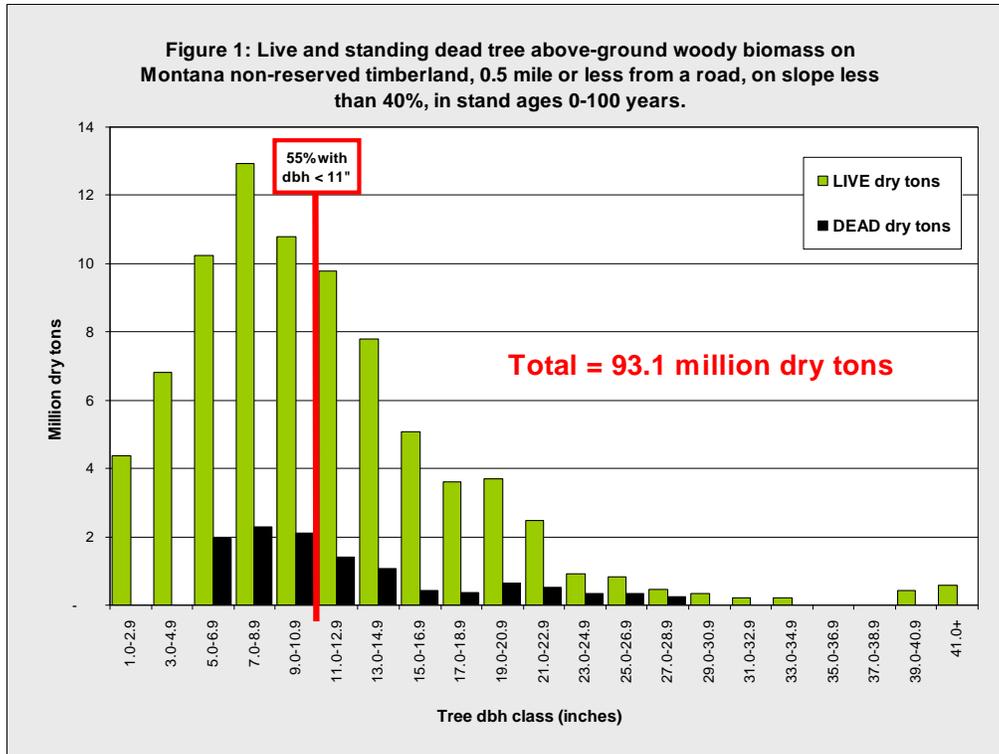
Filtered the FIA inventory data to estimate the “potentially available” amount of biomass:

Timberland < = 0.5 mile of a road – excludes “roadless” areas

In stands < = 100 years old – excludes “old” forests

On slope < = 40% – excludes steep ground

Tree diameter at breast height of 5.0 to 10.9 inches – excludes saplings & large trees



This slide shows all tree sizes on the “filtered” or “potentially available” land & biomass.

Area represented is just 3.6 million acres.

Over 90 million dry tons.

Very little biomass in larger trees.

Montana Forest-based Woody Biomass

"Potentially available"

- 3.6 million acres
 - 18 % of timberland
- 40.3 MDT in live & dead trees
 - 70 % in national forests
 - 5 % of biomass on timberland

Filtered the FIA inventory data to estimate the "potentially available" amount of biomass:

Timberland 3.6 million acres

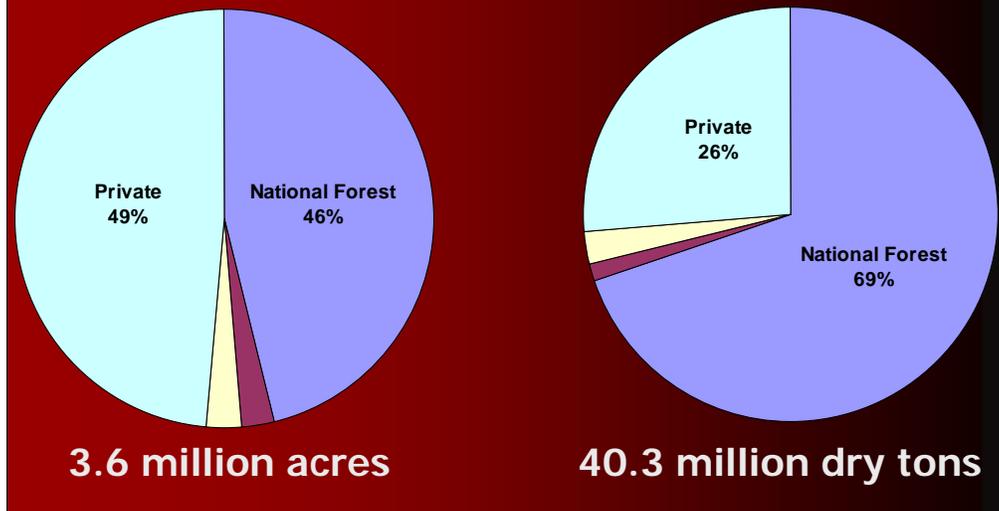
less than 18% of all timberland

40 million dry tons

less than 5% of live & standing dead tree biomass

Just for trees 5 to 10.9 inches dbh! Does not include the saplings & larger trees.

"Potentially Available" Land and Live & Standing Dead Tree Woody Biomass in Montana



This slide illustrates the OWNERSHIP/availability issue:

Very conservative estimate of potentially available acres & biomass

As I said before **3.6 million acres**

within 0.5 mile of road, in stands 0 to 100 years old, with slope of 0 to 40%

40.3 million dry tons

Just in tree 5 to 10.9 inches dbh

Almost HALF of this land

And almost 70% of biomass

is in national forests.

National forests are critical to the development of a biomass energy sector in Montana, as well as to the existing forest products industry, because of the large proportions of the forest land base and timber supply national forests account for in Montana.

Biomass supply is NOT the issue.

- **Multi-decade supply potentially available**
- **Availability is the issue!**
 - **Land ownership & accessibility**
 - **National forests are vitally important**

That is what it all comes down to.

I am very interested in what will be discussed during the "Forest Access & Timber Availability" at 3pm.

Without access to & availability of the woody biomass on federal lands in Montana, the whole woody biomass energy discussion

-- how to harvest it, how to use it, where to put facilities, how big they should be, etc--

is nothing more than a philosophical debate equivalent to how many angels can fit on the head of a pin.



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Thank you for your time.