

## Wisconsin Wood Supply Assessment

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### Objectives:

1. Determine the current growing stock volume in Wisconsin, aggregated by geographic region, ownership, and broad product categories.
2. Assess what land has been harvested in Wisconsin in the recent past, using county cutting notices, Wisconsin State Forest Continuous Forest Inventory, and FIA removal information. Use this information to identify physical/environmental characteristics (ownership, parcel size, site type, management restrictions, etc.) that impact likelihood of timber harvest and assess the portion of growing stock volume affected.
3. Model the Wisconsin wood supply chain for the next 10 to 30 years using agent-based modeling techniques, building on the expertise, staff, and lessons learned in Virginia.
4. Evaluate anticipated harvest quantities in the future under various assumptions of availability and wood demand.

### Key Findings:

1. Total non-federal forest inventory (thousand tons) for Wisconsin in 2013 was about 637 million tons, with 42% of this inventory in the Northern region and about 28% in the West Central region. Of the 637 million tons in Wisconsin's nonfederal forest inventory, 80% was hardwood and 20% softwood. About 47.5% of inventory was sawtimber.
2. Analysis of nonfederal forest distribution by parcel and forest tract size indicated that 16% of private forest acres were in ownership parcels less than 20 acres. About 30% of private forest acres were in forest tracts (patches of forest within a single ownership parcel) that are smaller than 20 acres. These findings indicate that a substantial portion of Wisconsin's private forest is in parcels that are more expensive (per ton) to harvest and more often belong to those less willing to harvest.
3. An assessment of availability based on examination of characteristics of recent harvests showed that the factors that best explain locations with timber harvest activity were percent wetland within 50 acres, distance to nearest road, mill density, and ownership class. Higher levels of harvest were associated with lower percent wetland, shorter distance to road, higher mill density, and MFL or State/County ownerships. Statewide, 62.4% of nonfederal forest acres were considered available, as were 63.7% of inventory tons. Availability of wood (tons) was highest in the Northern region (77.7%), followed by West Central and Northeastern (69.3%, 63.0% respectively).
4. Comparing available inventory, growth on the available inventory, and removals in the table below indicated that statewide there was surplus growth (in excess of removals) of 3.2 million tons annually, leading to a growth:removals ratio of 1.4. However, when individual product classes were considered, we found most of the surplus was in the sawtimber categories, while hardwood pulpwood was experiencing harvests that were 574 thousand tons in excess of growth and softwood pulpwood harvests that were approximately equal to growth.

Growing stock volume, availability, growth and removals by product category for Wisconsin, 2013.

Metric	Hardwood Sawtimber	Softwood Sawtimber	Hardwood Pulpwood	Softwood Pulpwood	Total
Non-federal inventory (k tons)	224,464	78,219	282,754	51,743	637,180
Available non-federal inventory (k tons)	137,469	52,156	181,640	34,390	405,655
Growth on available Inventory (k tons)	4,463	1,807	4,283	1,292	11,844
Removals/harvest (k tons)	1,771	638	4,856	1,336	8,601
Growth:Removals ratio	2.5	2.8	0.9	1.0	1.4
Growth surplus (deficit); (k tons)	2,691	1,169	(574)	(44)	3,243

5. We simulated the wood supply chain for a 30-year period in a baseline scenario that assumed (a) roundwood demand remains at current levels, (b) all landowners would be willing to harvest timber, (c) no harvest occurs on forest tracts smaller than 10 acres. Five iterations of these simulations revealed that while current harvest levels can be met, the model projects:
  - a) increasing harvest of sawtimber-sized material for pulpwood uses, and increasing stumpage prices for pulpwood. This effect was dramatic in hardwood (price increases on the order of 50% over 25 years) and modest in softwood (increases on the order of 20%).
  - b) overall forest inventory increased for all products while meeting harvest demands;
  - c) average haul distances increased slightly for pulpwood and for hardwood sawtimber, and remained relatively constant for softwood sawtimber.
6. Compared to the baseline scenario, sensitivity analysis on assumptions regarding landowner willingness to sell timber and harvest on small (<10 ac) tracts indicated that:
  - a) Including small tracts in the analysis increased available volume by 22% initially, and 67% at the end of 30 years (with all landowners willing to sell);
  - b) Using results from Dr. Vokoun's landowner survey relating willingness to sell to parcel size results in a reduction in available volume by about 90% at the end of 30 years (without including small forest tracts);
  - c) Assuming reduced landowner willingness to sell timber (as in ii above) but including small forest tracts in the analysis resulted in a reduction in available volume by about 75% at the end of 30 years.

So while inclusion of small forest tracts in the available would supply could increase potential timber supply, factoring in landowner willingness to sell timber has a more profound impact on timber availability.