

The Scale and Cost of Seasonal Harvesting Restrictions in Wisconsin

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Seasonal Harvesting Restrictions

- Purpose: protect the forest resource
- Example restrictions:
 - Winter only to protect soil
 - Oak wilt – no harvest April 1st or 15th – July 15th
 - Conifer stump treatment outside winter
 - Seasonal weight limits



Potential Impact of Seasonal Restrictions

- Reduced stumpage prices
 - \$65.82/ac reduction in MN
- Reduced logging capacity utilization
 - Weather-related down time
 - Less timber available seasonally
- Increased harvesting costs
 - BMPs cost \$1,562 per site in Arkansas
- Increased timber procurement costs
 - Inventory costs
 - Seasonal increases in delivered prices



Research Goals

1. Identify most common seasonal restrictions and motivations for them,
2. Estimate the cost of seasonal restrictions to landowners and forest industry, and
3. Summarize known ecological consequences of seasonal harvesting restrictions.



Methods – Timber Sale Analysis

- Analyzed WI DNR timber sale data for sales closed in 2013
 - 184 state sales
 - 100 county forest
 - 105 managed forest law (MFL) sales
 - 56 private, non-MFL sales
- Sales were classified by forest cover and soil type
 - Forest cover: upland hardwood, lowland hardwood, upland conifer, or lowland conifer
 - Soil types: sandy, loam, clay, wetland, mixed



Methods – Analysis of Bid Results

- Analyzed bid results from 2014 timber sales on Wisconsin County Forests
 - Collected prospectuses and bid results from 660 sales from 28 of 29 counties
- Used multiple linear regression to measure impact of seasonal restrictions and other variables on bidding behavior

**EAU CLAIRE COUNTY PARKS & FOREST
Spring 2014 TIMBER SALES BROCHURE
SCS-FM/GCC-0082G-E**

Attached are maps of the eleven timber sales available in the Eau Claire County Forest – tracts 17-13 thru 6-14. Loggers are expected to preview sales before bidding. Also attached are timber bid sheets, information on the mill scale ticket system, and right-of-way contacts.

Ammonium Root Rot Prevention

Purchaser shall apply Cellu-Treat (or equivalent) fungicide to all pine stumps within 24 hours of tree cutting. Purchaser shall apply Cellu-Treat (or equivalent) according to product label directions. County will provide the Cellu-Treat (or equivalent) product and dye. County will also provide the purchaser with a backpack sprayer if needed. Application of Cellu-Treat (or equivalent) is not required if the high temperature on the day of harvest is less than 32 degrees.

TOTAL ESTIMATED TIMBER VOLUMES

| | | | |
|---------------------|------------|-------------------|-----------|
| Aspen Pulp | 740 tons | Red Pine Pulp | 4475 tons |
| Mixed Hardwood Pulp | 4495 tons | White Pine Pulp | 430 tons |
| Red Maple | 414 tons | Oak Logs | 487 MBF |
| Oak Pulp | 10058 tons | Mix Hardwood Logs | 33 MBF |
| Oak Bolts | 430 cords | White Pine Logs | 53 MBF |

Ashland County Timber Sale Bid Results - December 2014

| 124 acres | | | | * Bidder | | |
|------------------|--------|----------|--------------------|--------------------|--------|--------|
| Species | Volume | Min Bid | Min Price | Schroer | Bidder | Bidder |
| MX Hardwood Pulp | 600 | \$15.00 | \$9,000.00 | \$38.00 | | |
| Basswood Pulp | 400 | \$1.00 | \$400.00 | \$20.00 | | |
| Balsam Fir Pulp | 80 | \$15.00 | \$1,200.00 | \$20.00 | | |
| Aspen Pulp | 350 | \$15.00 | \$5,250.00 | \$40.00 | | |
| Ash Pulp | 150 | \$15.00 | \$2,250.00 | \$20.00 | | |
| Tamarack Pulp | 200 | \$15.00 | \$3,000.00 | \$35.00 | | |
| Spruce Pulp | 100 | \$15.00 | \$1,500.00 | \$30.00 | | |
| Hard Maple Logs | 4 | \$120.00 | \$480.00 | \$200.00 | | |
| Mix Hdwd Logs | 1 | \$100.00 | \$100.00 | \$150.00 | | |
| Basswood Logs | 5 | \$80.00 | \$400.00 | \$100.00 | | |
| Ash Logs | 3.5 | \$100.00 | \$350.00 | \$150.00 | | |
| Total | | | \$23,934.00 | \$61,375.00 | \$0.00 | \$0.00 |


| 156 acres | | | | * Bidder | | |
|-------------------|--------|----------|--------------------|-------------------|--------------------|--------|
| Species | Volume | Min Bid | Min Price | Ashland Mat | Schroer | Bidder |
| MX Hardwood Pulp | 800 | \$15.00 | \$12,000.00 | \$47.97 | \$25.00 | |
| Aspen Pulp | 190 | \$15.00 | \$2,700.00 | \$39.35 | \$25.00 | |
| Balsam Fir Pulp | 300 | \$15.00 | \$4,500.00 | \$15.88 | \$16.00 | |
| Black Ash Pulp | 40 | \$15.00 | \$600.00 | \$24.80 | \$15.00 | |
| Tamarack Pulp | 250 | \$15.00 | \$3,750.00 | \$24.64 | \$25.00 | |
| Black Spruce Pulp | 80 | \$15.00 | \$1,200.00 | \$20.48 | \$25.00 | |
| Hard Maple Logs | 32 | \$120.00 | \$3,840.00 | \$466.19 | \$300.00 | |
| Red maple Logs | 42 | \$100.00 | \$4,200.00 | \$340.84 | \$300.00 | |
| Yellow Birch Logs | 9 | \$100.00 | \$900.00 | \$333.30 | \$150.00 | |
| Black Ash Logs | 2 | \$100.00 | \$200.00 | \$42.10 | \$120.00 | |
| Mix Hdwd Logs | 1 | \$100.00 | \$100.00 | \$166.10 | \$120.00 | |
| Total | | | \$33,998.00 | \$3,053.88 | \$57,860.00 | \$0.00 |

| 204 acres | | | | * Bidder | | |
|-------------------|--------|----------|--------------------|--------------------|--------|--------|
| Species | Volume | Min Bid | Min Price | Schroer | Bidder | Bidder |
| MX Hardwood Pulp | 1000 | \$15.00 | \$15,000.00 | \$38.00 | | |
| Aspen Pulp | 80 | \$10.50 | \$840.00 | \$38.00 | | |
| Balsam Fir Pulp | 320 | \$10.50 | \$3,360.00 | \$25.00 | | |
| Black Spruce Pulp | 45 | \$10.50 | \$472.50 | \$35.00 | | |
| Black Ash Pulp | 200 | \$10.35 | \$2,070.00 | \$25.00 | | |
| Hard Maple Logs | 31 | \$90.00 | \$2,790.00 | \$250.00 | | |
| Red maple Logs | 12 | \$120.00 | \$1,440.00 | \$200.00 | | |
| Yellow Birch Logs | 25 | \$70.00 | \$1,760.00 | \$200.00 | | |
| Black Ash Logs | 13 | \$61.00 | \$793.00 | \$100.00 | | |
| Mix Hdwd Logs | 1 | \$170.00 | \$170.00 | \$150.00 | | |
| Total | | | \$28,195.50 | \$72,815.00 | \$0.00 | \$0.00 |



Methods – Surveys

- Forester survey
 - WDNR cooperating foresters and public sector foresters
 - Private sector: 184 foresters – consultants and industry
 - Public sector: 197 foresters – State, Counties, and Forest Service
 - Response rate = 65.0%
- Mill survey
 - Mail survey of 165 mills
 - Pulpmills (including composite mills)
 - Small sawmills (<50,000 tons/yr)
 - Medium & large sawmills (50,000+ tons/yr)
 - Response rate = 39.0%
- Dillman (2007) Tailored Design Method for both surveys



University of Wisconsin-Stevens Point
College of Natural Resources

forestGUILD

UW-Stevens Point & Forest Guild Forester Survey

Frequency and Rationale for Seasonal Restrictions

1. During a typical year, what percentage of the timber sales that you prepare or administer include the following types of restrictions? (Please check one box per item)

| | Rarely or Never | 1-5% | 6-10% | 11-25% | 26-50% | 51-75% | 76-90% | 100% |
|--|----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Access/transportation restrictions | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Armscum root rot restrictions | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Biomass harvesting guidelines (e.g. retain coarse woody debris) | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Cultural or archeological restrictions | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Invasive species best management practices | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Oak wilt restrictions | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Pest restrictions (other than oak wilt or armscum) | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Rare species/wildlife restrictions | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Recreation-related restrictions (e.g. deer hunting, winter sports, etc.) | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Soil/hydrological disturbance (rutting, compaction, runoff, etc.) restrictions | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Requiring that an aspen stand be harvested in the winter | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Water quality best management practices | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |



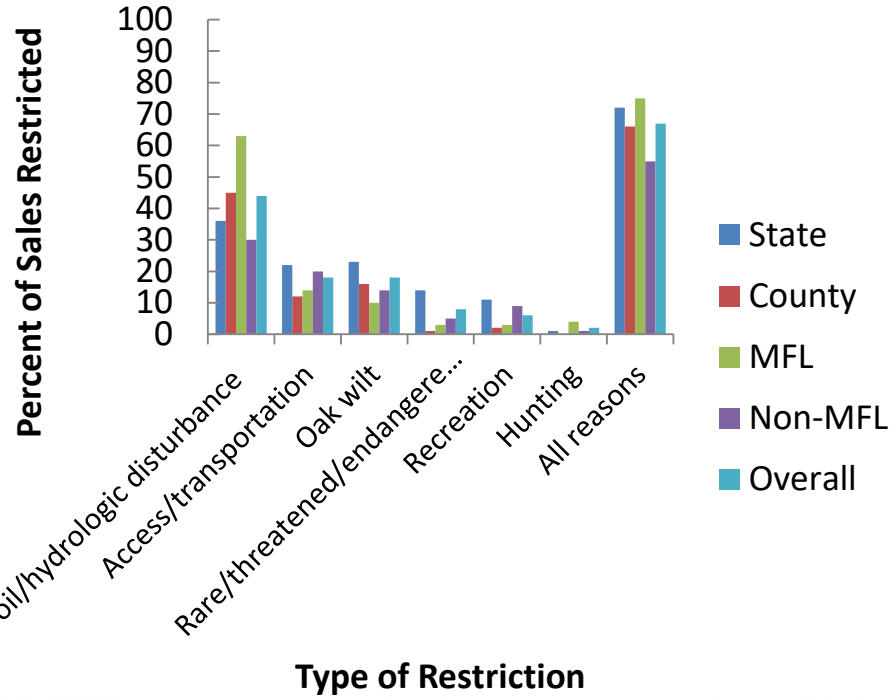
Results – Timber Sale Availability by Month

| Ownership | Percent of timber sales available by Month | | | | | | | | | | | |
|----------------|--|------|------|------|-----|------|------|------|------|------|------|------|
| | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Oct. | Nov. | Dec. |
| State | 100 | 100 | 75 | 52 | 52 | 52 | 56 | 87 | 87 | 87 | 87 | 100 |
| County | 99 | 99 | 72 | 43 | 43 | 44 | 46 | 67 | 67 | 67 | 67 | 100 |
| MFL | 100 | 100 | 67 | 31 | 30 | 30 | 32 | 59 | 61 | 61 | 61 | 100 |
| Non-MFL | 100 | 100 | 88 | 77 | 77 | 77 | 77 | 91 | 91 | 91 | 91 | 98 |
| Total | 100 | 100 | 74 | 47 | 46 | 47 | 49 | 73 | 73 | 73 | 73 | 100 |

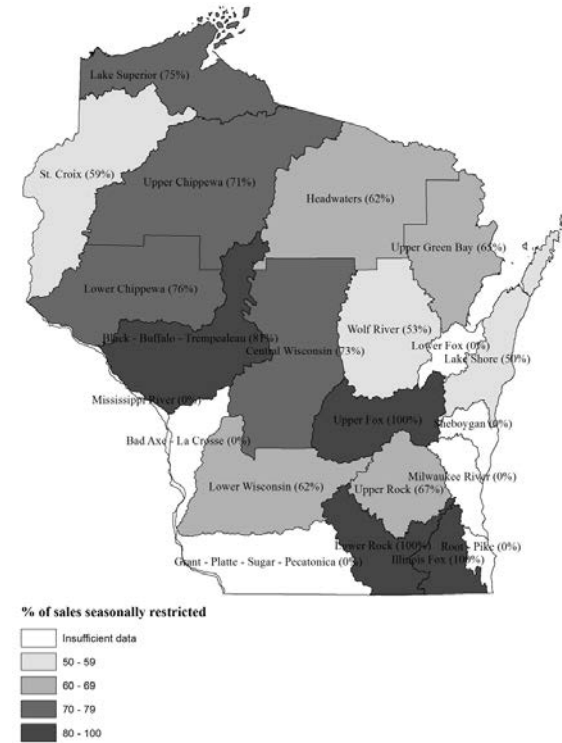


Percent of Sales with Restrictions

Percent of sales restricted by reason



Percent of sales restricted by geographic management unit



Commonly Restricted Periods for Timber Harvesting in WI

| Rationale | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec |
|-------------------------|-----|-----|-----|-----|-----|------|------|-----|-----|-----|-----|-----|
| Wood turtle | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| Blanding's turtle | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |
| Northern goshawk | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| Northern long-eared bat | | | | | | ■ | ■ | ■ | | | | |
| Oak wilt | | | | ■ | ■ | ■ | ■ | ■ | | | | |
| Annosum root rot | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |
| Hydrology/soil* | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | |
| Recreation* | | | | | | | | | | | ■ | ■ |

* These restrictions are specific to site and/or landowner preferences and thus the timing of application can be variable.



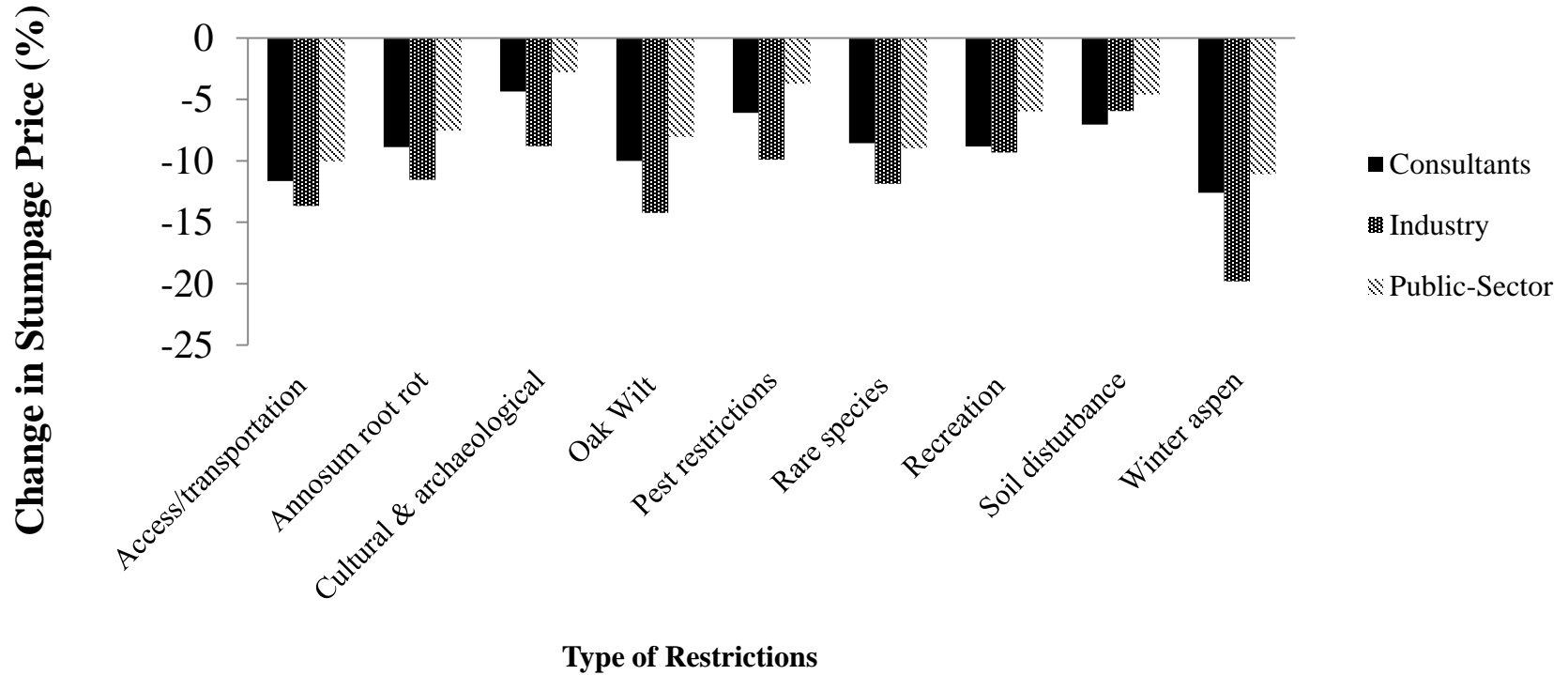
Rationale for Restrictions

- Forester survey results agreed with timber sale analysis
- Most common motivations for restrictions were landowner goals and professional judgment

| Restriction | Most common motivation | 2 nd most common motivation |
|-----------------------|-----------------------------|--|
| Access/transportation | Landowner objectives (57%) | Professional judgment (56%) |
| Oak wilt | Professional judgment (67%) | Program requirements (e.g. MFL) (54%) |
| Recreation | Landowner objectives (81%) | Professional judgment (15%) |
| Soil disturbance | Professional judgment (78%) | Forest certification (62%) |



Stumpage Price Reductions



Seasonal Restrictions' Cost to Landowners

- Total cost to landowners = \$22.2 million per year
 - \$3.15 per ton of restricted timber
- Cost calculated by combining survey results and published harvest volumes and stumpage prices by species
 - Harvest volume by species (2009-2012)
 - Percent of sales restricted based on timber sale analysis
 - Percent stumpage reduction from survey results
 - Weighted average stumpage prices from Timber Mart North



2014 County Forest Timber Sale Analysis

- 67% had at least one seasonal restriction
- 34% of sales were restricted to winter harvesting
- Winter-only sales received 3.32 bids per sale
 - Received 4.78 bids per sale in other sales
- Winter-only restriction reduced bids by \$141/ac



Forest Industry Response to Restrictions

1. High inventory levels
2. Use of satellite wood yards
3. Increases in delivered prices

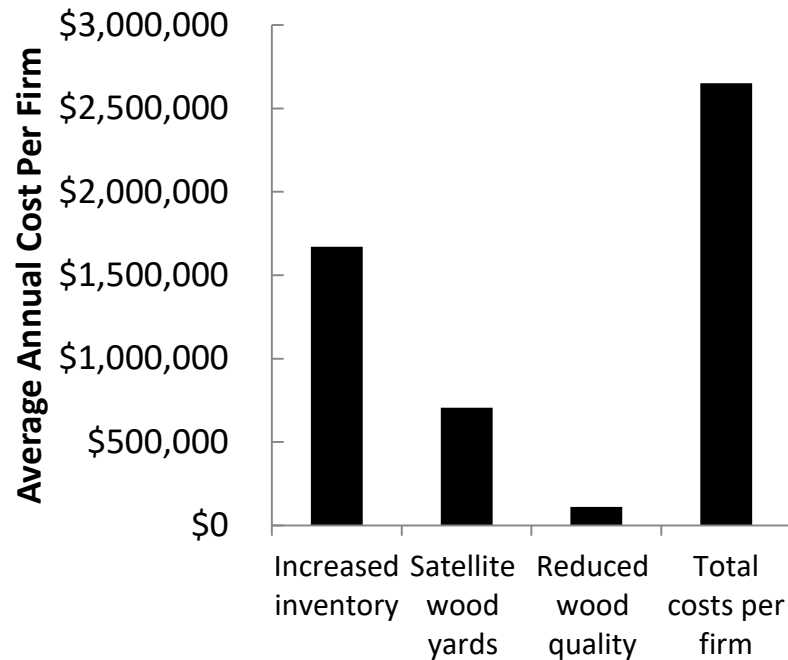
| Practice | Mill type ¹ | Percent of respondents | | |
|----------------------|--------------------------|------------------------|-----------|-----------|
| | | Increased | No change | Decreased |
| Inventory level | Medium and large sawmill | 20 | 50 | 30 |
| | Small sawmill | 42 | 35 | 23 |
| | Pulpmill | 89 | 0 | 11 |
| Satellite wood yards | Medium and large sawmill | 40 | 50 | 10 |
| | Small sawmill | 8 | 92 | 0 |
| | Pulpmill | 89 | 11 | 0 |
| Delivered price | Medium and large sawmill | 70 | 30 | 0 |
| | Small sawmill | 46 | 54 | 0 |
| | Pulpmill | 89 | 11 | 0 |

¹Medium and large sawmill = 50,000+tons; Small sawmill = <50,000 tons

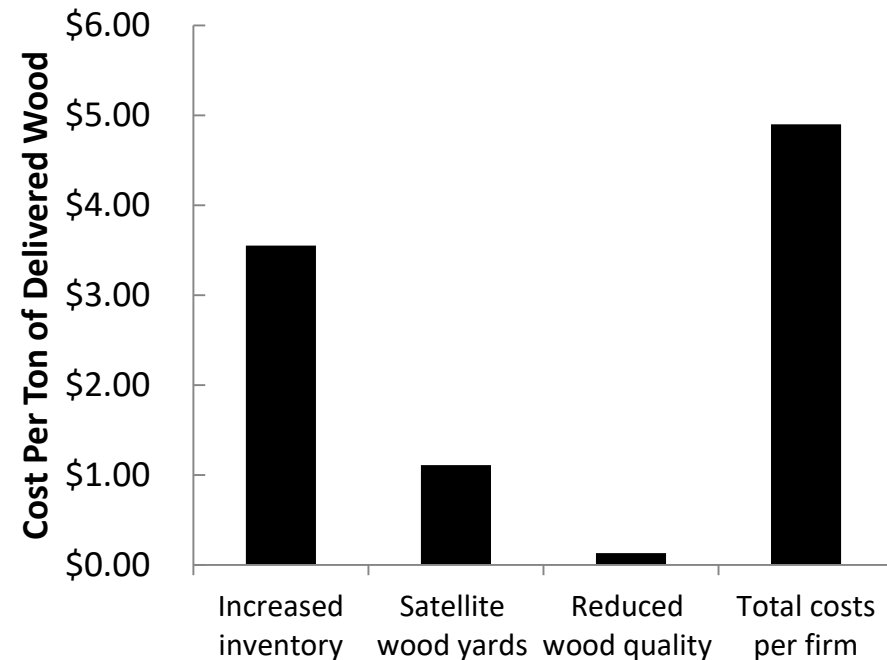


Seasonal Restrictions' Cost to Pulpmills

Total annual cost

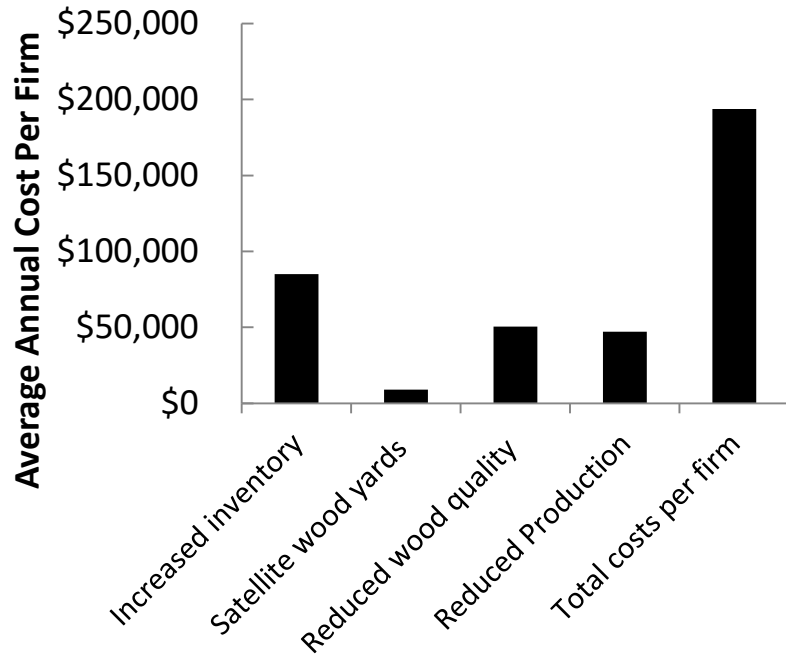


Cost per ton of delivered wood

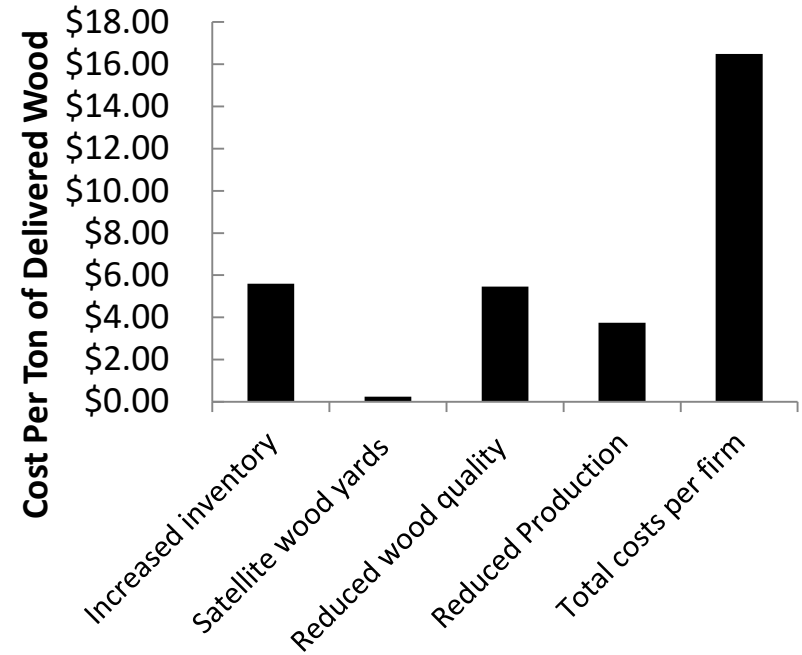


Seasonal Restrictions' Cost to Small Sawmills

Total annual cost



Cost per ton of delivered wood



Most Impactful Restrictions for Mills

- Oak wilt
 - Rated most burdensome by pulpmills and small sawmills
- Access/transportation
- Seasonal weight limits



Literature Review

- Literature generally supportive of the need to protect resources
 - Stump treatments to prevent annosum root rot
 - Seasonal restrictions to protect some species
- Ecological consequences of seasonal shifts in harvesting are unclear
 - Pine harvests concentrated in spring
 - Disturbance-dependent species harvested in winter
- Multi-year studies needed to evaluate effectiveness of restrictions/guidelines/policies



Conclusion

- Approximately 67% of sales had at least one seasonal restriction
- Seasonal restrictions reduced stumpage prices
- Seasonal restrictions imposed costs on forest industry
 - Inventory increases
 - Satellite wood yards
 - Wood quality reductions during storage
- Long-term ecological consequences are unclear

