WI Forest Practice Study; Overview and Outcomes

WISCONSIN COUNTY FORESTS ASSOCIATION
2018 SPRING COUNTY FOREST ADMINISTRATORS MEETING

PRESENTED BY:
TOM HITTLE,
SENIOR VICE PRESIDENT,
PROJECT COORDINATION AND BUSINESS DEVELOPMENT

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March 16, 2018

Presentation Outline

1. WFPS Overview
2. Studies
3. Implementation

Overview

- The FY2014-2015 Budget included funding for a *Wisconsin's Forestry Practices Study* (WFPS).
- Funding for the WFPS is a $600,000 Grant, over 2 years, from the WDNR forestry account to GLTPA and WCFA.
- As requested by GLTPA and WCFA, the Wisconsin Council on Forestry engaged to review and provide input on direction of the WFPS. https://councilonforestry.wi.gov
- GLTPA and WCFA selected NCASI to serve as the Research Coordinator.
  NCASI is an independent, non-profit 501(c)(6) research institute formed in 1943 focusing on environmental and sustainability topics relevant to forest management and the manufacture of forest products.

Overview

Study Projects addressed the following questions:

- What is the availability of wood fiber - now and in the future?

  (e.g. net supply - (current consumption + environmental/ BMP/ harvesting guideline constraints + economic constraints + landowner objectives, etc.)

- What are the forestry-related factors to enhance or that reduce competitiveness of forest-based manufacturing in Wisconsin?

- What are economic and ecological consequences (cost/benefits) of forestry policies, regulations and guidelines (PRGs)?

Overview

2014 – Forest Industry Stakeholder Workshop

2014 - 2016 – Project work and results

2017 – Ad Hoc Teams translate research findings into recommendations/assignments (CoF approved Aug.)

2017 – Council on Forestry accepts priority recommendations on actions to take and asks DNR and partners to implement

2018- Implementation into Guidance and Handbooks; training; collaborative efforts

2014 Forest-Based Manufacturing Industry Workshop

Objectives

- Solicit input on the WDNR forest management policies, regulations and guidelines (PRG) that are economically burdensome;
- Categorize the cost impact to the industry of the identified PRGs; and
- Rank the identified PRGs in order of importance.

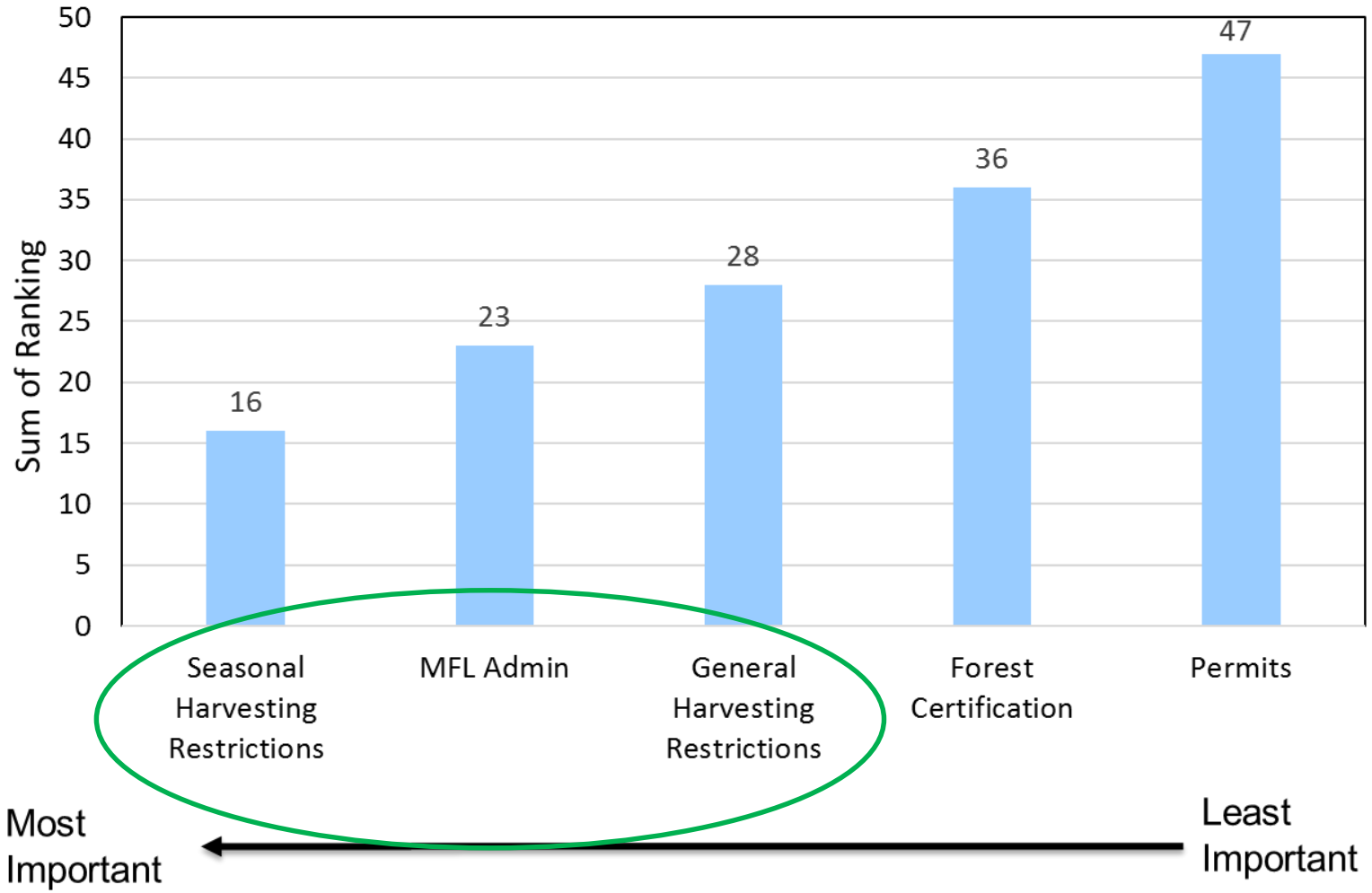
2014 Forest-Based Manufacturing Industry Workshop

Participants identified 5 Broad Economically Burdensome Topics.

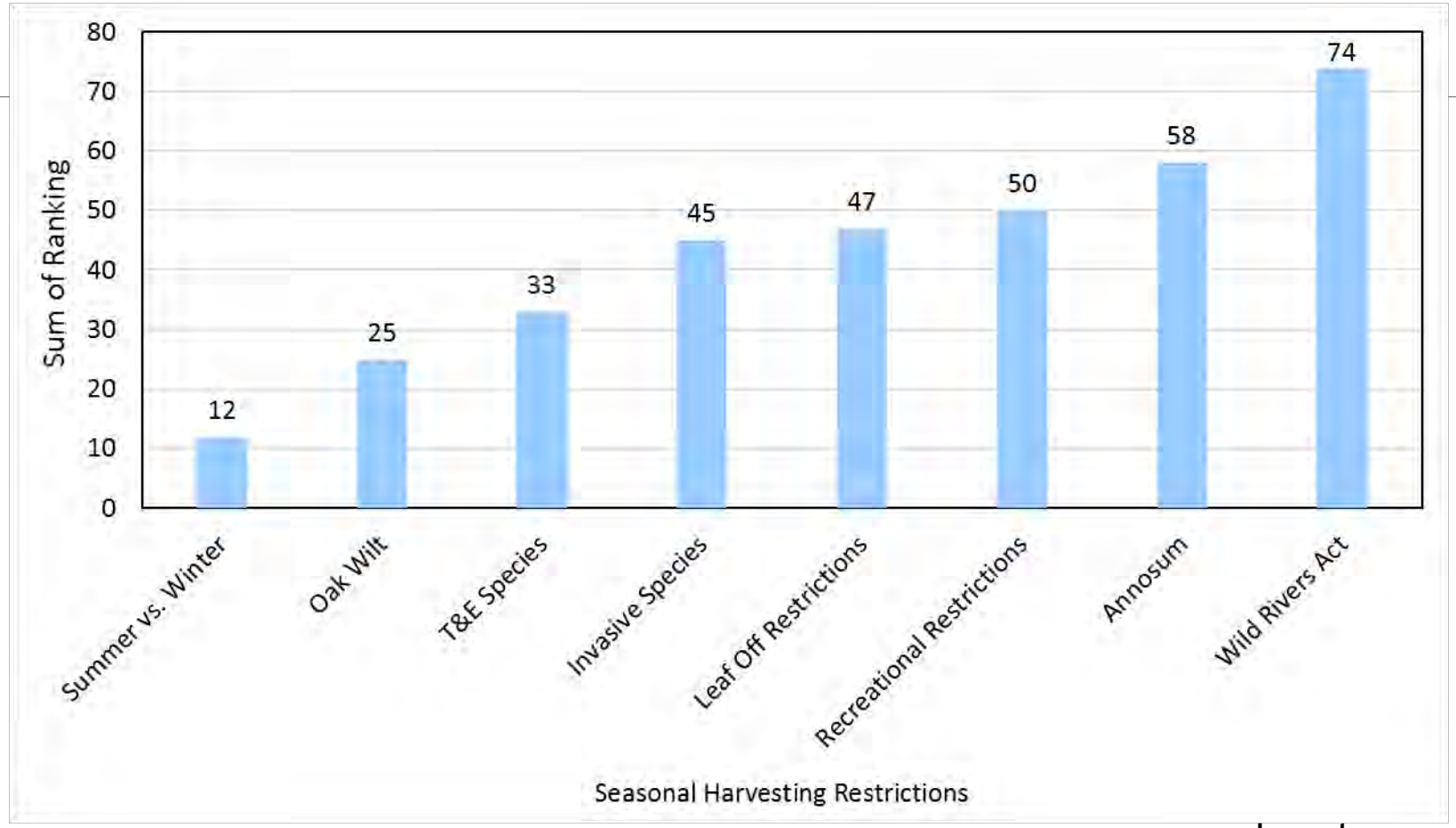
- Seasonal Harvesting Restrictions
- Managed Forest Law Administration
- General Harvesting Restrictions
- Forest Certification
- Permits

Following the meeting the participants ranked the importance of the identified Broad Topic and PRGs.

Broad Economically Burdensome Topics

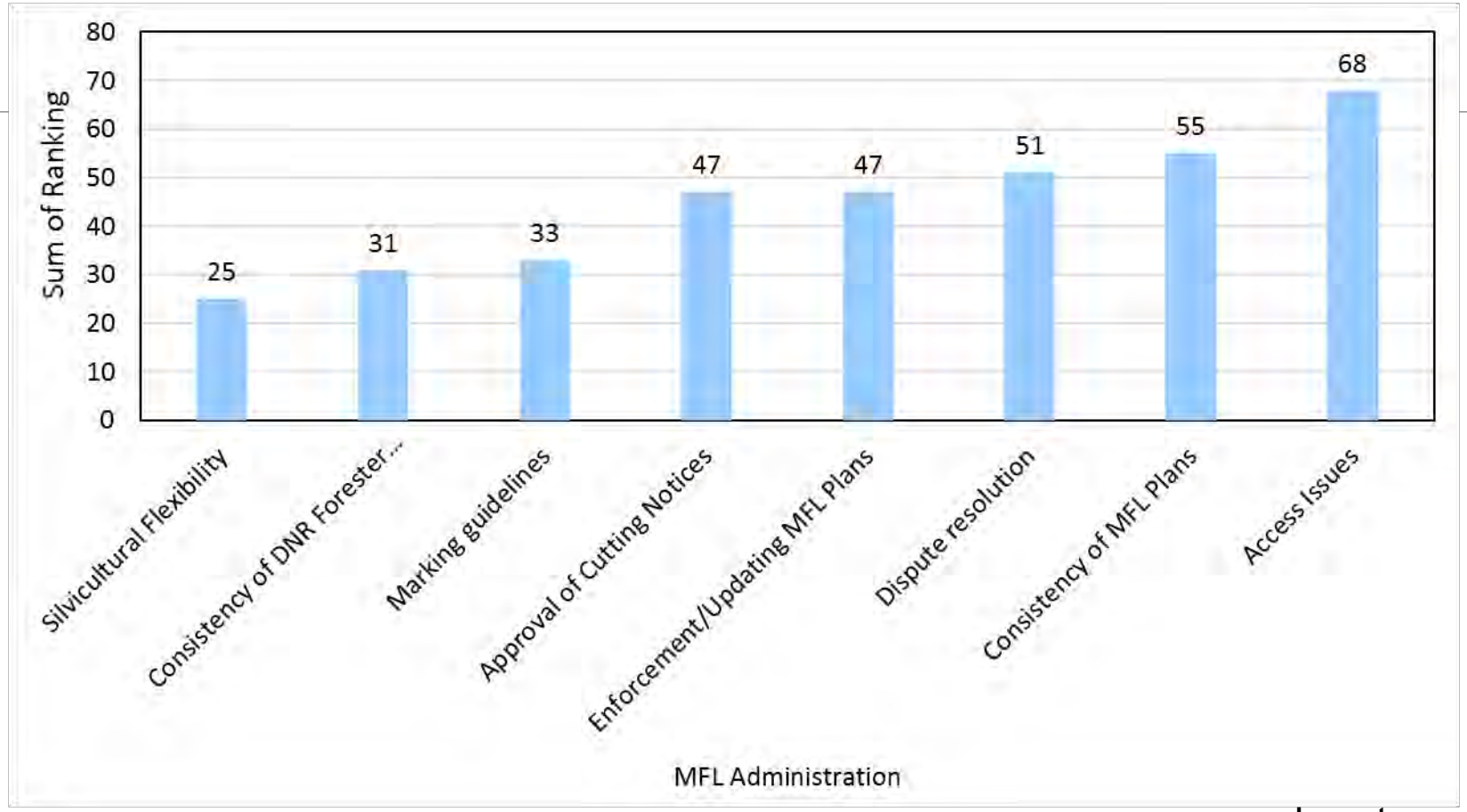


Seasonal Harvesting Restrictions



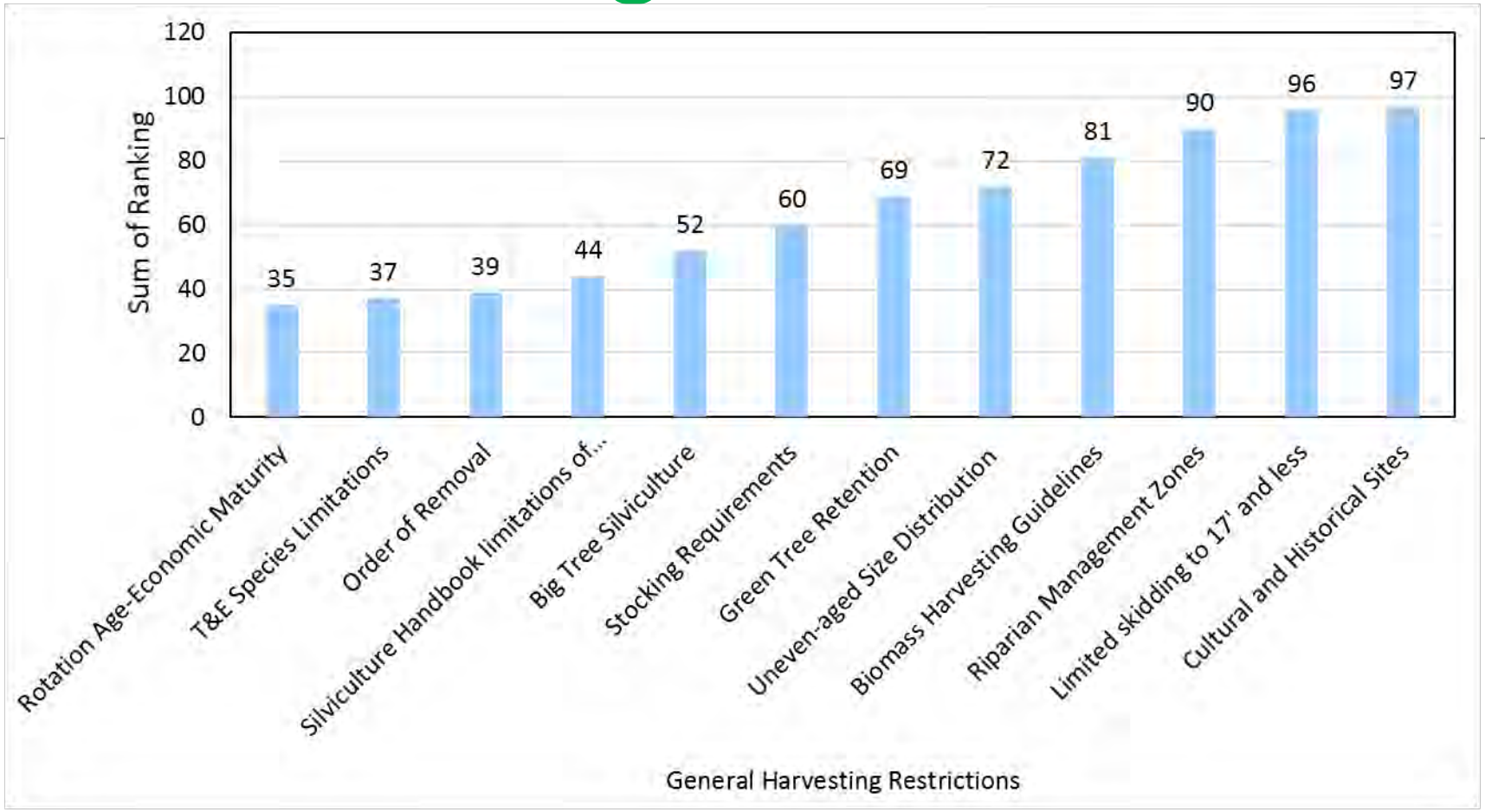
Most Important ← Least Important

MFL Administration



Most Important ← Least Important

General Harvesting Restrictions



Most Important ← Least Important

RFP Process ⟹ Five Studies

1. *Wisconsin Wood Supply Assessment*
   Virginia Tech – Dr. Steven Prisley
2. *Economic and Ecological Effects of Forest Practices and Harvesting Restrictions on Wisconsin's Forest Resources and Economy*
   Forest Stewards Guild – Dr. Zander Evans
3. *The Scale and Cost of Seasonal Harvesting Restrictions in Wisconsin*
   UWSP – Dr. Michael Demchik

RFP Process ⟹ Five Studies

4. *Wood Supply Chain Component Cost Analysis: A Comparison of WI and U.S. Regional Costs*

   Steigerwaldt Land Services – Forrest Gibeault

5. *An Analysis of : Single Tree Selections Order-of-Removal (OOR) Procedures in Northern Hardwood Forests and Rotation Lengths in Red Pine Plantations and Aspen Forests*

   Steigerwaldt Land Services, Inc. – Forrest Gibeault

Wisconsin Wood Supply Assessment

(1) a baseline resource assessment for non-federal forests of Wisconsin,
(2) a landowner survey and analysis to assess attitudes of private landowners regarding timber harvest,
(3) a logging capacity utilization study to assess the capacity of Wisconsin's logging force and its utilization rates, and
(4) A simulation of future wood supplies in Wisconsin under defined sets of assumptions.

Study Findings

- One-fifth of Wisconsin's private forest area occurs in ownership parcels less than 20 acres, and less than 2% of harvest-like disturbances occur in these smaller forest tracts.
- Primary factors driving the likelihood that a forest may be harvested include percent of the neighboring area that is classified as wetland, distance to a road, density of mills within a 100-mile radius, and the land ownership status (private vs. state or county, and whether enrolled in MFL).
- Findings show that 62.4% of Wisconsin's non-federal forest acres and 64% of volume may be considered "available".

Study Findings

- A positive overall balance between forest growth and harvests, and evidence of ongoing increases in overall forest inventory.
- Wisconsin's logging force faces challenges in maintaining efficiency and productivity in the face of weather-related and regulatory constraints.
- The interaction of all of these factors creates a challenging environment for the wood-using industry in Wisconsin.

Economic and Ecological Effects of Forest Practices and Harvesting Constraints on Wisconsin's Forest Resources and Economy

Forest Stewards Guild

This study focuses on forest management constraints that are designed to protect or enhance forest productivity, safeguard populations of sensitive animals, or control invasive species.

The purpose of this study is to evaluate the collective impact of constraints on forestry activities and to assess the economic and ecological consequences of those constraints.

Study Findings

- Based on harvest case studies, 95 percent of harvests had a seasonal constraint.
- On average, constraints reduced the number of months of allowable operation to 6.5, although the particular months of allowable operation varied greatly by sale.
- Including July in the operable months increased pulp prices by almost a third.
- Survey indicated over 70 percent of timber professionals indicated they believed protecting forest resources and values was either extremely or moderately important.
- Water quality and forest health received the highest importance

Study Findings

- In most cases, foresters and timber professionals reported that they apply constraints based primarily on professional judgment.
- Practitioners noted that they would adhere to most constraints regardless of whether they were required to do so by law or policy because they are ethically obliged to apply the best science to their work and to act to protect the long-term health of the forest.
- Since most foresters and timber professionals apply constraints because of their professional judgement, changes to official guidance may not result in changes on the ground unless based on sound science accepted by forestry professionals.

THE SCALE AND COST OF SEASONAL TIMBER HARVESTING RESTRICTIONS IN WISCONSIN

University of Wisconsin Stevens Point

1) identify the most commonly imposed seasonal restrictions and the degree to which seasonal restrictions vary by geographic area, soil type, and forest types in Wisconsin;

2) estimate the cost of seasonal restrictions to loggers, forest landowners, and the forest products industry; and

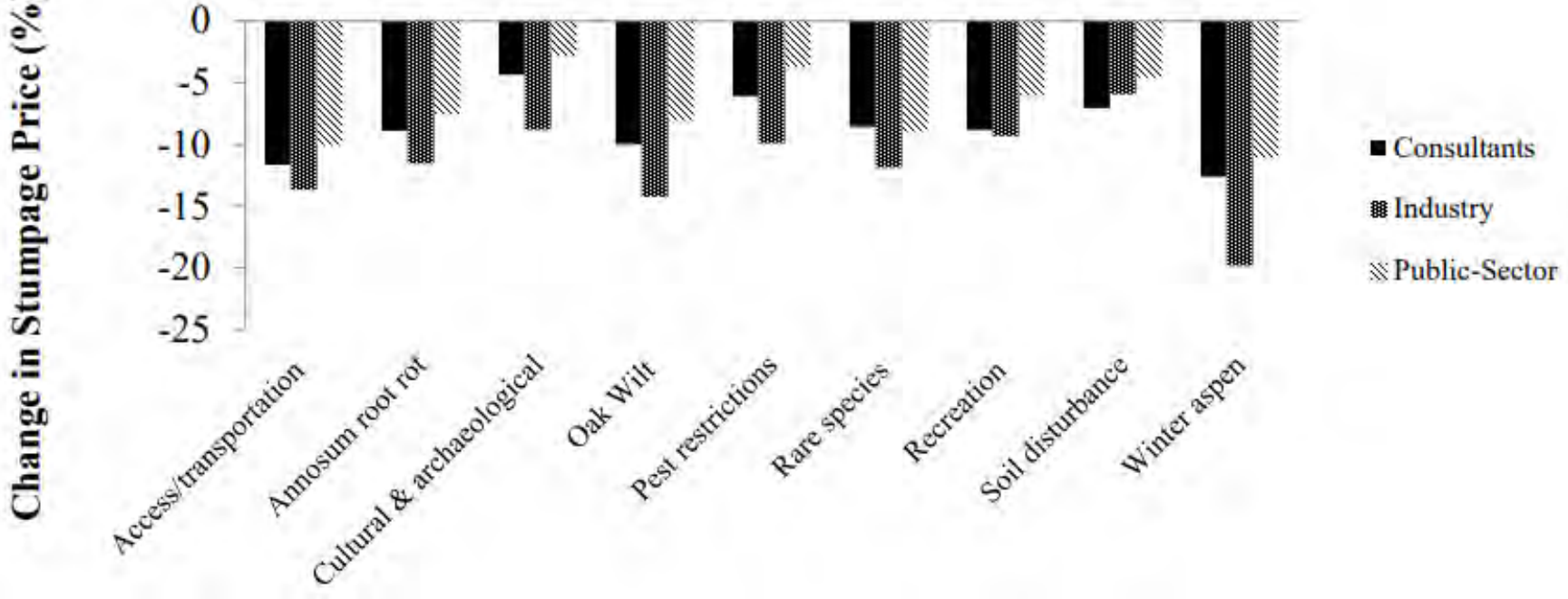
3) summarize the known ecological consequences of seasonal timber harvesting restrictions.

Study Findings

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

Study Findings

Stumpage Price Reductions



Study Findings

Seasonal Restrictions' Cost to Landowners

- Total cost to landowners = $22.2 million per year – $3.15 per ton of restricted timber

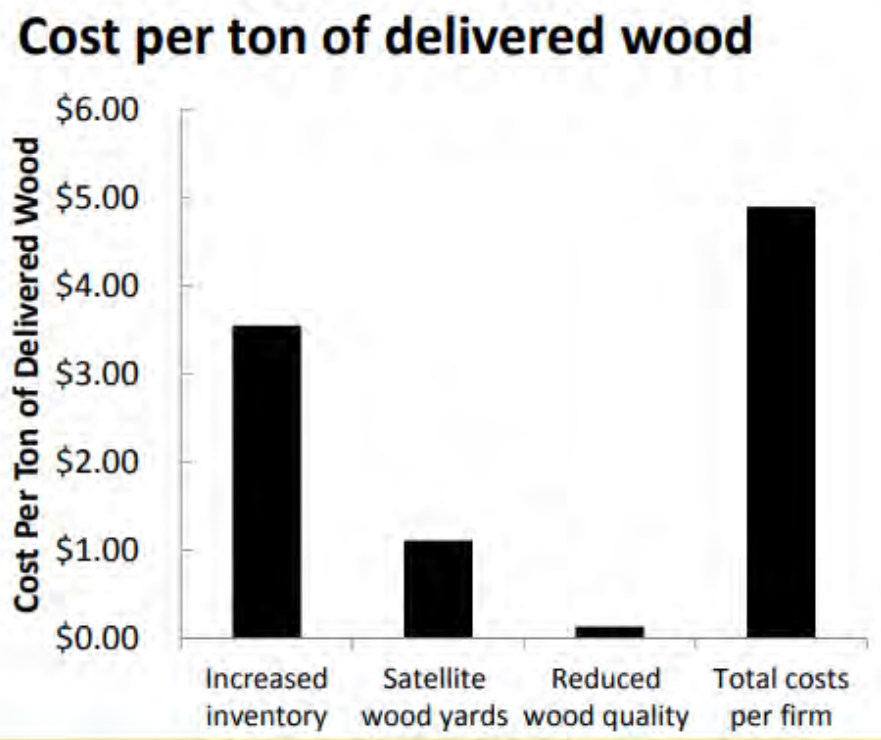
2014 County Forest Timber Sale Analysis

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

Study Findings

Seasonal restrictions imposed costs on forest industry – Inventory increases – Satellite wood yards – Wood quality reductions during storage.

Seasonal Restrictions' Cost to Pulpmills



Wood Supply Chain Component Costs Analysis: A Comparison of Wisconsin and U.S. Regional Costs

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FOREST2MARKET

The focus of this research centers on the evaluation of the costs of each link in Wisconsin's wood fiber supply chain and a comparison of these costs to other regions in the United States.

Study Findings

Supply Chain Cost Component (%)						
Aspen Pulpwood						
Region	Total Delivered ($ per ton)	Other	Harvesting	Freight	Margin	Stumpage
Lake States	$ 47.74	4%	34%	27%	6%	30%
Northeast	$ 53.08	1%	38%	27%	5%	28%
Hardwood Pulpwood						
Region	Total Delivered ($ per ton)	Other	Harvesting	Freight	Margin	Stumpage
Lake States	$ 51.62	12%	32%	25%	4%	28%
Northeast	$ 51.87	3%	40%	28%	4%	24%
South	$ 40.95	7%	30%	24%	11%	27%
Pacific Northwest	$ 40.17	25%	47%	22%	4%	2%
Conifer Pulpwood						
Region	Total Delivered ($ per ton)	Other	Harvesting	Freight	Margin	Stumpage
Lake States	$ 49.67	10%	34%	25%	5%	26%
Northeast	$ 43.75	2%	48%	31%	5%	15%
South	$ 33.63	2%	35%	24%	5%	33%
Pacific Northwest	$ 46.48	22%	38%	21%	5%	15%

F2M Derived Average Haul Distance by Region and Product Grouping, Q3 2013 through Q2 2015

	Average Haul Distance		
Region	Conifer	Hardwood	Aspen
Lake States	106	115	71
Northeast	76	90	77
South	54	66	-
Pacific Northwest	48	41	-

Study Findings

- Wisconsin's costs vary when compared to other regions and species groups, generally with higher delivered and stumpage costs.
- Harvesting costs likewise vary, generally being lower than the Northeast and higher than the South.
- Wisconsin-delivered fiber costs typically include higher freight and "other" costs (handling, procurement, etc.) in most instances.
- Wisconsin and the U.S. Northeast will be at a competitive disadvantage when total delivered pulpwood fiber costs are compared to the South, due largely to differences in seasonal weather-related impacts on operability, such as prolonged spring breakup periods, along with other unique forest and operational characteristics.

An Economic and Ecological Analysis of: Northern Hardwood Single-Tree Selection Order of Removal Procedures and Evaluation of Red Pine Plantation and Aspen Forest Type Rotation Ages

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Investigate pre- and post-harvest forest conditions considering WDNR Order-of-Removal (OOR) in northern hardwood forests and model alternative harvest scenarios to evaluate the economic and ecological consequences of OOR guidelines.

Simulate yields and economic returns from typical even-aged management of aspen and red pine on a representative range of site quality classes seeking to determine optimal economic rotation ages.

Study Description

Stands on state, county, and private MFL lands were sampled and analyzed. A total of ten timber sales were selected in each ownership group.

Alternative tree harvest selection scenarios were developed.

The cut versus leave designations were determined using a tree selection model built in Microsoft Excel. Trees were prioritized for harvest based on three indices: *removing risk (Index 1), harvesting mature (Index 2), & and releasing crop trees (Index 3).* Each index had an associated formula to determine the tree's ranking, which was independently applied to each tree. Trees that received higher ratings were prioritized for harvest first.

Study Description

Index 1: Remove Risk – 60 to 65 percent of harvest BA • Remove trees in the worst GS classes • Additional weight given to sawtimber-sized trees.

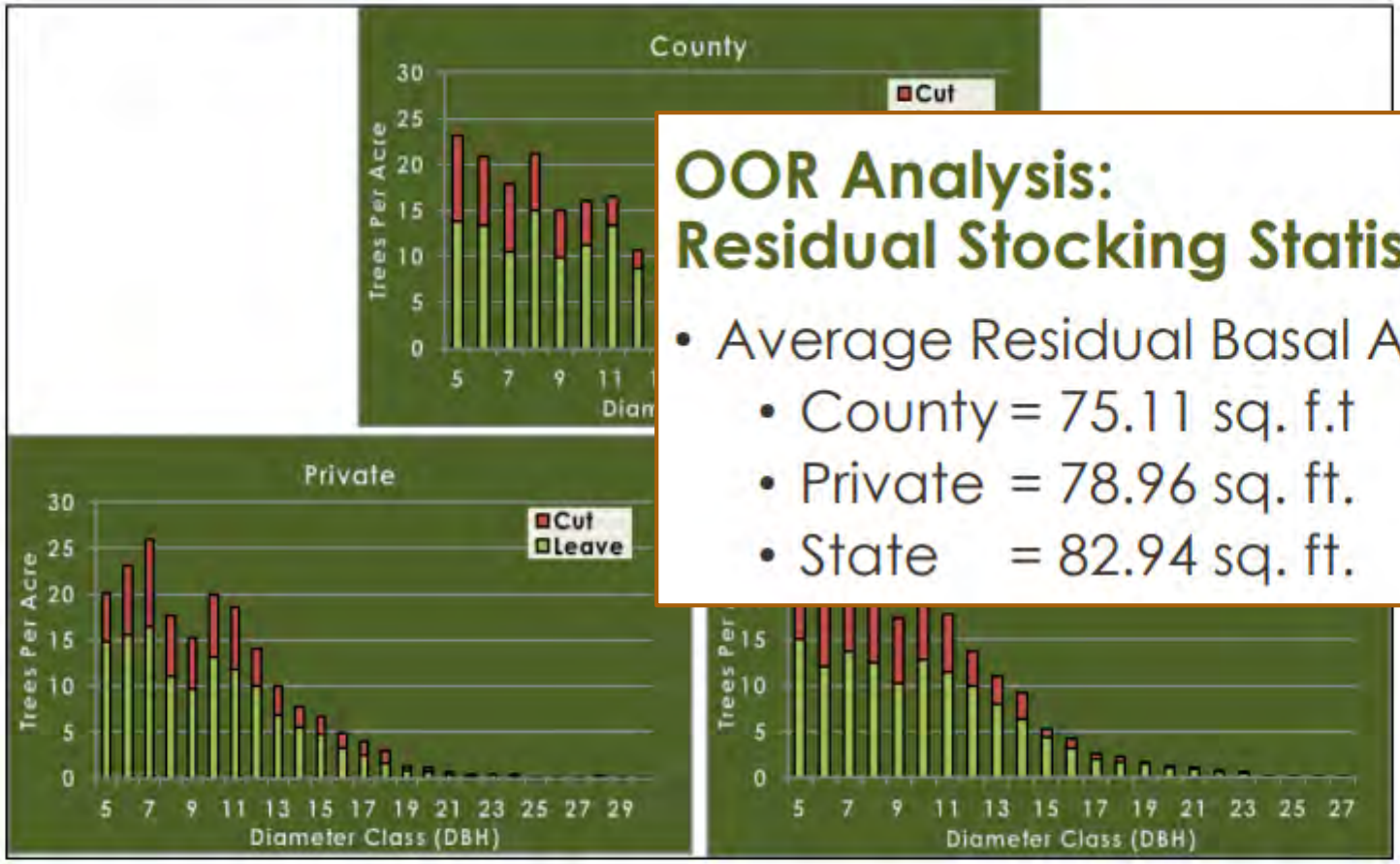
Index 2: Remove Mature – 25 percent of harvest BA • Scenario 1: >=17 inches DBH • Scenario 2: >=19 inches DBH • Remove poor GS and top performers, which are likely economically mature.

Index 3: Release Crop Trees – 10 to 15 percent of harvest BA • Remove trees in close proximity to other growing stock and those of low canopy position with low GS classification.

Study Findings

OOR Analysis: Current Conditions

- Most of the stand structures suggest an even-aged forest structure.
- Harvest heavy to smaller size classes.

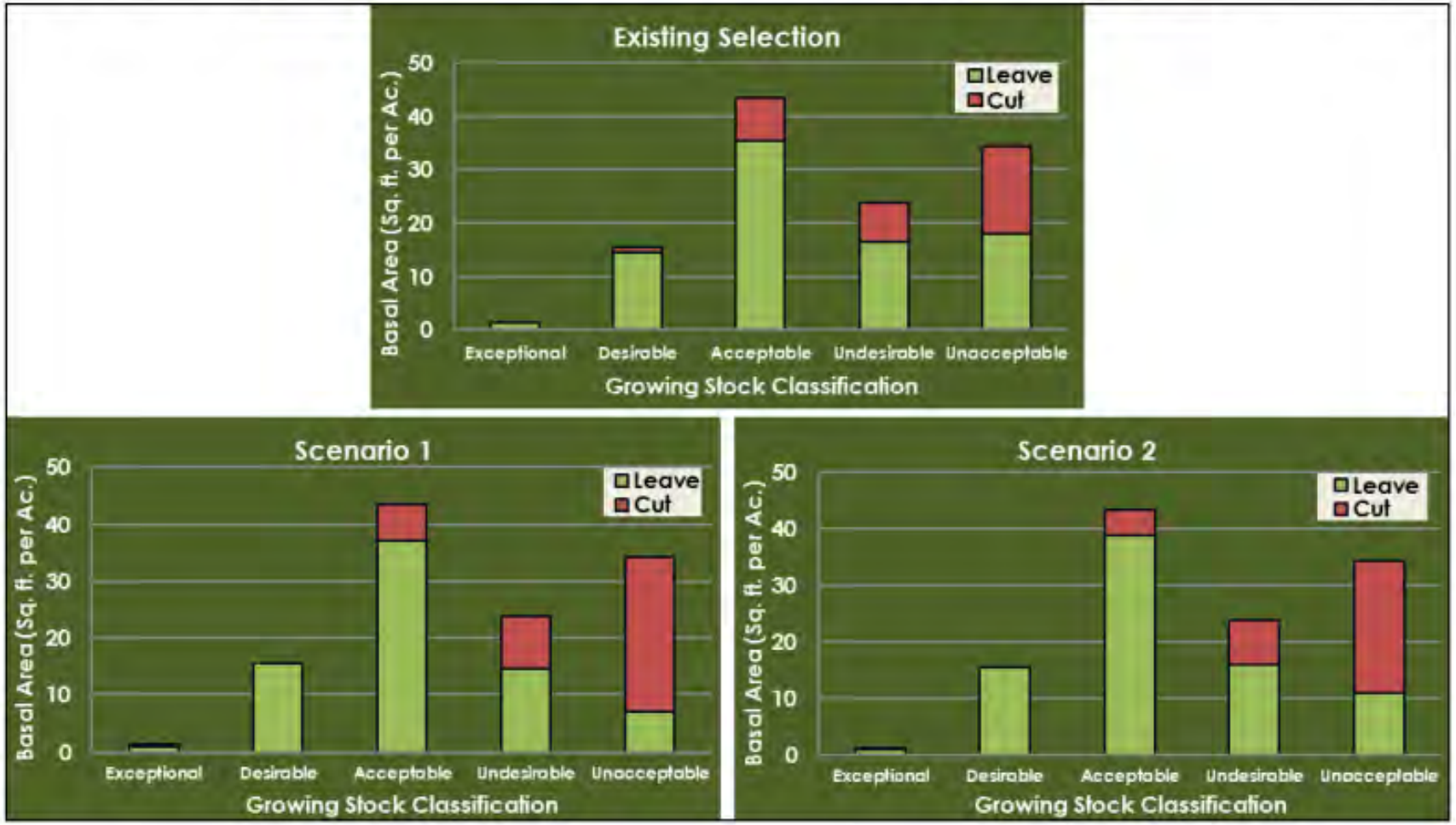


OOR Analysis: Residual Stocking Statistical Comparison

- Average Residual Basal Areas
  - County = 75.11 sq. f.t
  - Private = 78.96 sq. ft.
  - State = 82.94 sq. ft.

Study Findings

Alternative harvests removed more unacceptable growing stock.



Study Findings

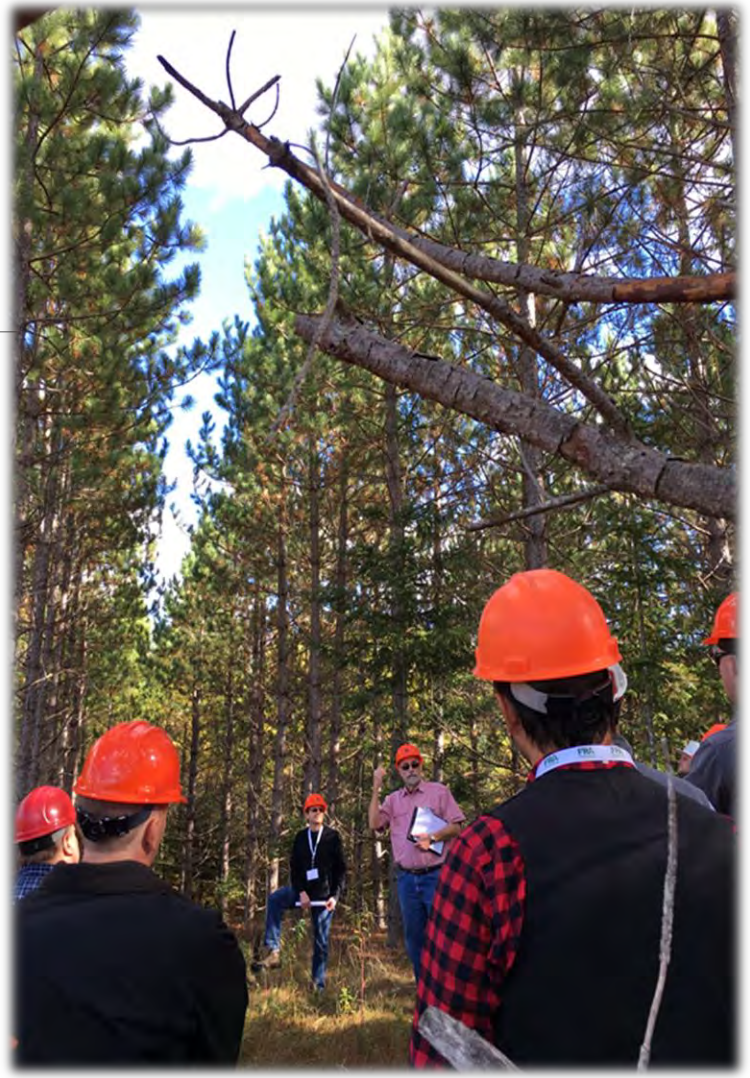
County Harvest Comparison					
	Existing Selection	Scenario 1		Scenario 2	
	Value Per Acre	Value Per Acre	Percent Dif.	Value Per Acre	Percent Dif.
Cut	$ 740.80	$ 897.20	21.10	$ 665.40	-10.18
Leave	$2,225.60	$2,069.30	-7.02	$2,301.00	3.39
Total	$2,966.40	$2,966.40	-	$2,966.40	-
	Poletimber (Tons)	Poletimber (Tons)	Percent Dif.	Poletimber (Tons)	Percent Dif.
Cut	22.0	25.1	14.22	23.1	4.92
Leave	39.5	36.4	-7.92	38.4	-2.74
Total	61.5	61.5	-	61.5	-
	Sawtimber (MBF)	Sawtimber (MBF)	Percent Dif.	Sawtimber (MBF)	Percent Dif.
Cut	1,022.2	1,118.3	9.40	661.6	-35.27
Leave	3,858.3	3,762.2	-2.49	4,218.9	9.35
Total	4,880.5	4,880.5	-	4,880.5	-
	Basal Area (Ft.2)	Basal Area (Ft.2)	Percent Dif.	Basal Area (Ft.2)	Percent Dif.
Cut	38.7	44.8	15.79	38.0	-1.91
Leave	81.5	75.4	-7.50	82.2	0.91
Total	120.2	120.2	-	120.2	-

Table 28 – OOR Analysis: Average Hard Maple Rate of Value Growth (RVG) Comparison

County	
Scenario	RVG of Residual Trees
Before Harvest	.022
Existing Selection	.028
Scenario 1	.033
Scenario 2	.032
Private	
Scenario	RVG of Residual Trees
Before Harvest	.013
Existing Selection	.018
Scenario 1	.028
Scenario 2	.027
State	
Scenario	RVG of Residual Trees
Before Harvest	.020
Existing Selection	.024
Scenario 1	.031
Scenario 2	.030

Rather, RVG provided an estimate of potential increase in value for hard maple growing stock resulting from the various harvest scenarios

Evaluation of Red Pine Plantation and Aspen Forest Type Rotation Ages



The current value of any capital asset can be viewed as the discounted value of the future net income stream it is capable of producing.

Forestland buyers and owners with economic objectives often examine anticipated cost outlays, timber growth, and timber sale revenue using discounted cash flow (DCF) analysis.

Land expectation value (LEV) is a special application of DCF analysis that looks at a continuous cycle of hypothetical forest rotations.

Study Findings

- On low quality sites, using a 5.5 percent discount rate, the financially optimal rotation was at age 40, which is the required minimum (WDNR, SFAH, HB2431.5)
- For Site Index 70 at a 5.5 percent discount rate, the financially optimum rotation length was 36 years, with a physical yield of 0.63 cords per acre per year.
- For Site Index 80 at 5.5 percent discount rate, the financially optimum rotation length was 33 years, with a physical yield of 0.84 cords per acre per year

Study Findings

Results: Red Pine Financially Optimal Rotation Ages

- Based on Soil Expectation Value (SEV) and a 5.5 percent discount rate.
- A shorter 3 thinnings regime produces more value than 60 years with 4 thinnings.
- Low quality sites (SI 62): 54 years
- Average quality sites (SI 65): 50 years
- High quality sites (SI 72): 48 years

Implementation

Three CoF Recommendation Subcommittees:

- WFPS Outreach and Training Implementation Subcommittee
- WFPS Seasonality Subcommittee Recommendations
- WFPS Silviculture Subcommittee Recommendations

WFPS Ad Hoc established to develop specific tasks and actions based on WFP/CoF recommendations.

WFPS Action Items Ad Hoc Team: Heather Berklund, DNR Forestry Deputy, Brad Hutnik, DNR Silviculturalist on SGT, Tom Hittle, Steigerwaldt, Silv Guidelines, Ken Price, Consultant, Seasonality Implementation, Mark Rickenbach, UW, Outreach and Training

Implementation

- SGT/ad hoc teams given assignments; amend workplan
- GLTPA: Oak Wilt Training, EAB, Weight restriction recommendations
- WI Private Forestry Advisory Council (WPFAC) and UW: Identifying private forestry outreach initiatives
- CoF: Prioritizing project funding and research initiatives
- CoF: continue to work through legislative recommendations

https://councilonforestry.wi.gov/Documents/PracticesStudy/wfpsImplementationFinal_20171127.pdf

Topic	Recommendation #	Recommendation	WFPS Link	Assigned Party	Assignment #	Assignment	Implementation Notes	Estimated Delivery Date	WFPS Advisory Team Priority
Northern Hardwood Mgmt.	1	The WNDR should transition from guidelines and policy based on the order of removal as established in the WDNR Silvicultural Handbook and establish guidance, as opposed to rules, for individual tree selection in northern hardwood stands. Guidance should be adaptable to landowner objectives, consider both biological and economic concerns, and foster development of crop trees while maintaining minimum basal area stocking levels consistent with current northern hardwood silvicultural science.	Steigerwaldt 2016, p. 51	Wisconsin Silviculture Guidance Team (SGT)	1.1	The Wisconsin Silviculture Guidance Team (SGT) will examine whether the concept of order of removal should be retained and/or revised along with investigating other tree selection options. If retained, it will also explore how to add flexibility within the standard order of removal. SGT will expand current work revising and adding clarity to The WDNR Silviculture Handbook, Chapter 24: Tree Marking and Retention Guidelines and Chapter 21: Natural Regeneration - Single Tree Selection (STS). This work will include additional explanation on the proper application of marking processes within the context of landowner objectives and the resulting silvicultural prescription.	There is confusion among foresters (both public and private) on the intent and usage of the standard "order of removal" marking recommendation in relation to northern hardwood management. Specifically the standard order of removal is often confused or used interchangeably with the single-tree selection (STS) regeneration method. Already confused by many with intermediate thinning, the STS method has multiple prescription components that are not considered by the standard order of removal marking guide. To facilitate flexibility in marking assessment, SGT should also explore options for evaluating marking other than the Marked Assessment Tool. Example stand level metrics to replace the current tool based on ODR would be identified along with an appropriate methodology to determine if marking achieves goals.	December-2018	High
			Steigerwaldt 2016, p. 51	Wisconsin Silviculture Guidance Team (SGT), Northern Hardwood Ad Hoc Team	1.2	The SGT Northern Hardwood Ad Hoc Team will revise the WDNR Silviculture Handbook, Chapter 40: Northern Hardwood Chapter to add clarity to the single tree selection section, marking guide examples, and explore additional options to the single tree selection method to provide additional flexibility in achieving landowner objectives.		December-2018	High
Northern Hardwood Mgmt.	2	The definition for the term "crop tree" should be revised and expanded to include various elements that incorporate landowner objectives whether they are economic, ecological, or social. A crop tree will have the potential to increase in value by a jump in grade or increase in ecological function; having not yet achieved its maximum economic, ecological, or social potential. The tree will exhibit quality with future potential. When the potential for increase in value growth peaks, it should no longer be considered a crop tree and should be eligible for harvest, subject to landowner objectives.		Wisconsin Silviculture Guidance Team (SGT)	2.1	The Wisconsin Silviculture Guidance Team will evaluate and review ongoing work to develop a crop tree definition and complementary Growing Stock Classification System (GSCS) to help foresters evaluate tree quality and potential.	Work on defining a growing stock classification should be explicit in discussing the difference between a tree classification and a marking prescription. Economic maturity and related decisions on when to harvest a tree is a management consideration reflected in a prescription, not determined by growing stock status.	December-2018	High
				Wisconsin Silviculture Guidance Team (SGT), Northern Hardwood Ad Hoc Team	2.2	The Wisconsin Silviculture Guidance Team will work to better define timber, aesthetic, and wildlife crop trees and provide tools for assessing crop trees within the WDNR Silviculture Handbook. In addition, The WDNR Northern Hardwood Ad Hoc Team will add a new economics section and revised stem quality section to the Northern Hardwood Chapter to expand on crop tree assessment.		December-2018	High
				Wisconsin Silviculture Guidance Team (SGT)	2.3	The Wisconsin Silviculture Guidance Team will expand discussion on crop tree selection in addition to the Growing Stock Classification System in Chapter 24: Marking Guidelines.	Risk and economic loss (ex. present value, rate of return) should be reviewed.	December-2018	High
Northern Hardwood Mgmt.	3	Develop a marking guide that accounts for variable stand conditions, along with the current typical Wisconsin northern hardwood stand structure, and that includes considerations for the range of crop tree definitions and landowner objectives.		Wisconsin Silviculture Guidance Team (SGT)	3.1	The SGT will develop a tool to guide tree harvest and retention decisions made while marking timber. The tool will be adaptable to various stand level prescriptions and related landowner management objectives.	Better field marking guides are needed, not only for northern hardwoods but all cover types, to improve the implementation of silviculture prescriptions on the ground.	December-2018	
				Wisconsin Silviculture Guidance Team (SGT), Northern Hardwood Ad Hoc Team	3.2	The SGT Northern Hardwood Ad Hoc Team will add northern hardwood marking prescription examples for specific regeneration methods, stand conditions, and landowner objectives as an appendix to the revised Northern Hardwood Chapter.		December-2018	

Implementation – SGT/Silviculture Handbook

- Flexibility
- Landowner Objectives
- Economics
- More Informative / Less Prescriptive
- Focus Remains on Sustainable Forestry

Implementation – SGT/Silviculture Handbook

The Wisconsin Silviculture Guidance Team (SGT)

- will examine whether the concept of **order of removal** should be retained and/or revised along with **investigating other tree selection options**. This work will include additional explanation on the proper application of marking processes within the context of landowner objectives and the resulting silvicultural prescription.
- will revise the Silviculture Handbook, to add **clarity to the single tree selection section**, marking guide examples, and explore additional options to the single tree selection method to **provide additional flexibility in achieving landowner objectives**.
- will evaluate and review ongoing work to develop a **crop tree definition and complementary Growing Stock Classification System (GSCS**) to help foresters evaluate tree quality and potential and provide tools for assessing crop trees.
- will add a **new economics section** and revised stem quality section to the Northern Hardwood Chapter to expand on crop tree assessment.
- will develop **a tool to guide tree harvest and retention decisions made while marking timber**. The tool will be adaptable to various stand level prescriptions and related landowner management objectives.
- will develop an ad hoc team to provide **training** based on the Northern Hardwood Chapter revision.
- will continue work to **define flexible rotation age guidance for aspen and red pine** based an examination of current research, actual stand data, field experience, and WFPS study results.


STAY TUNED

Thank You!

Tom Hittle, ACF

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