

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

Fred Clark

Mike Lynch

Zander Evans, Genesis Mickel, Kim Chapman, Elizabeth Tiller, and
Monica Haynes



Forest Stewards Guild

putting the forest first

The Guild provides training, policy analysis, and research to support practicing foresters and allied professionals and to engage a broader community in the challenges of forest conservation and management.



Ecology of Dead Wood in the Northeast

by Alexander M. Evans and Matthew J. Kely



forest GUILD

May 2010



Primary Questions

1. What is the scope of selected timber harvesting restrictions in Wisconsin, and the potential for the restrictions to shift forest harvesting from summer to winter months?
2. What are the economic consequences of the timber harvesting restrictions identified in question 1?
3. What are the ecological consequences of the timber harvesting restrictions identified in question 1?



Method Used to Address These Questions

- Reviewed existing scientific literature
- Held stakeholder listening sessions
- Mapped affected areas
- Analyzed harvest cases studies
- Conducted surveys of foresters and timber professionals
- Model economic effects
- Assessed ecological impacts

Project Partners

Bureau of Business and
Economic Research

Labovitz School
OF BUSINESS AND ECONOMICS

UNIVERSITY OF MINNESOTA DULUTH

Driven to Discover



Forms of Forest Management Constraints

Constraints occur in many forms and come from several sources:

1. Mandatory requirements which carry the force of law, such as regulations
2. Quasi-mandatory requirements such as those requirements imposed as a term of contract or by professional organizations as part of third-party certification or professional accreditation
3. Voluntary guidelines that are recommended but not required
4. Independent judgments made by foresters, timber professionals, or forest landowners.

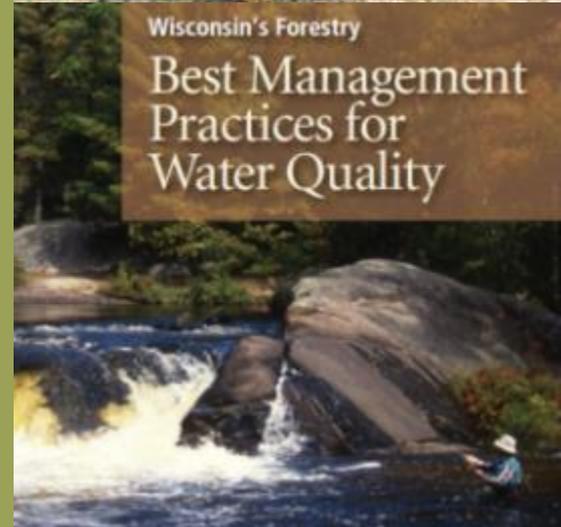
Listening sessions

- May 5th 2015, Rockbridge Sawmill, Richland Center
- May 7th 2015, GLTPA Office, Rhinelander



Constraints Highlighted by Lit Review and Listening Sessions

- Prevent or control forest pests or diseases
 - Oak wilt and Annosum rot root
- Invasive Plants
- Threatened Species
 - Wood turtle, goshawk, other forest-nesting birds
- Forest Productivity
- Water Quality
- Biomass



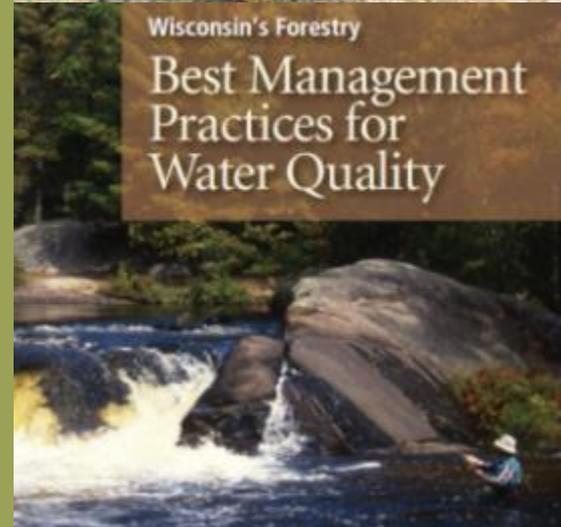
Other issues

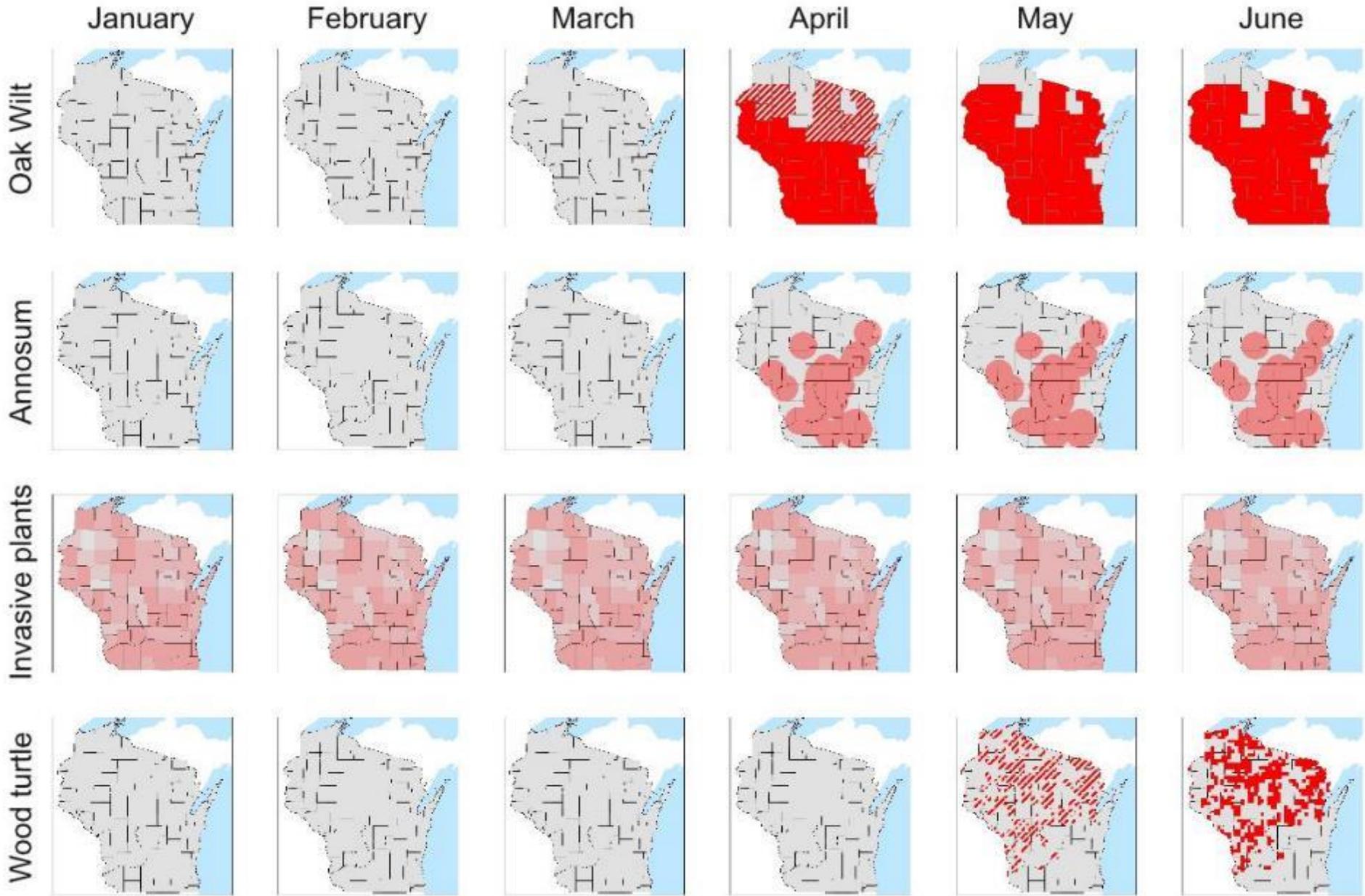
- Hunting / Outdoor Recreation
- Size of forestland holdings
- Distance to roads
- Forest certification
- Weather
- Crop-off
- Owner attitudes toward harvest

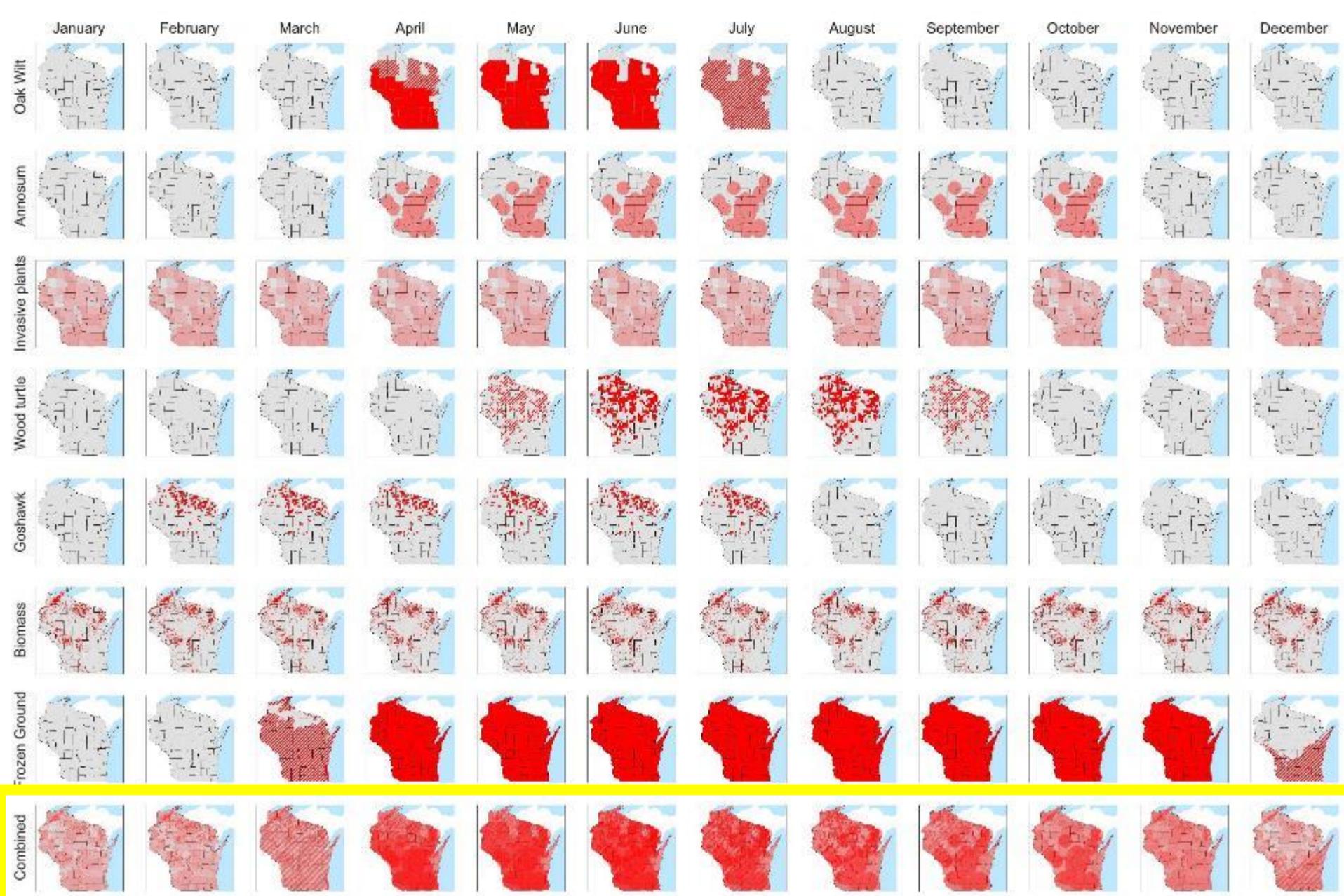


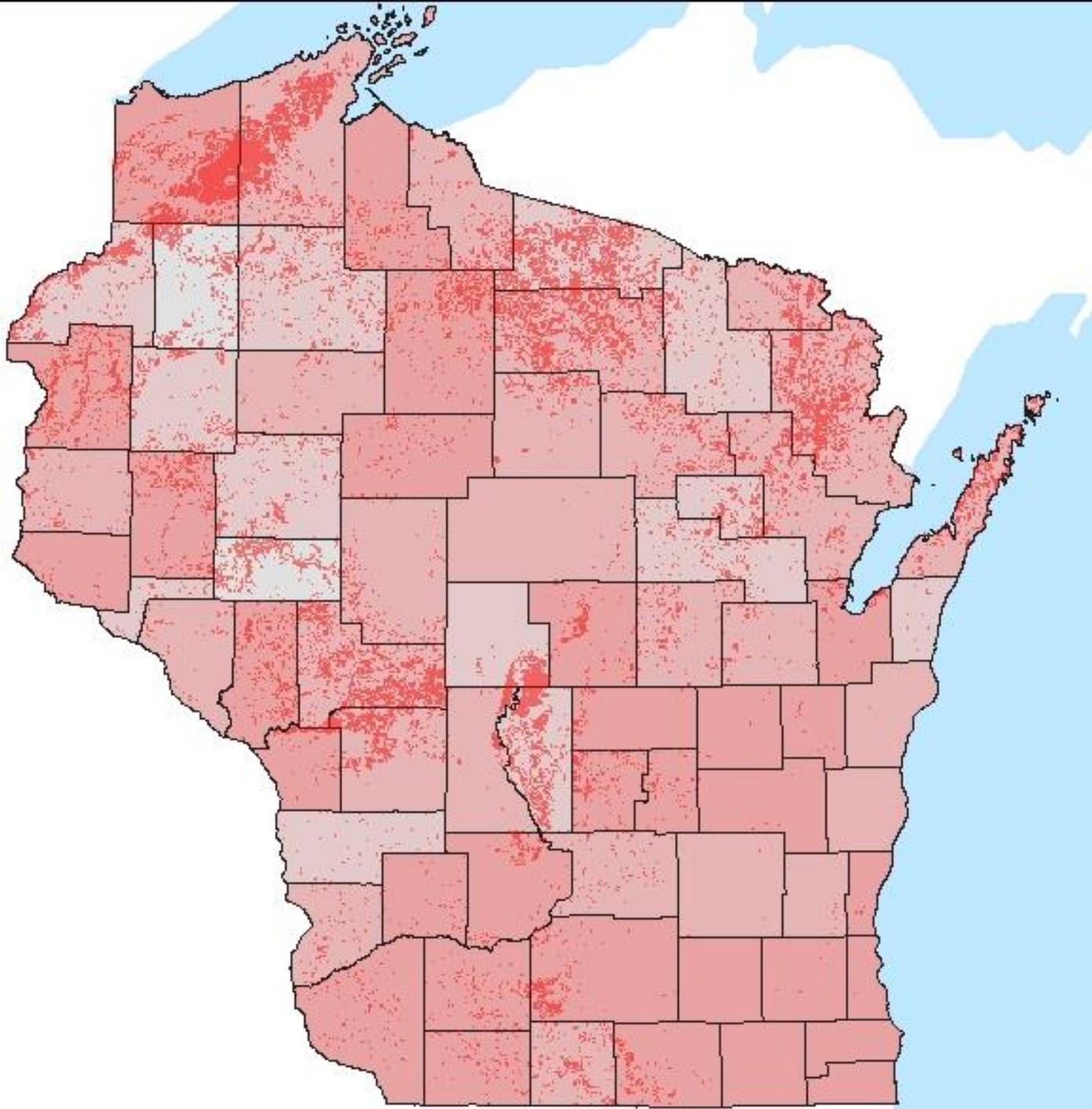
Constraints Highlighted by Lit Review and Listening Sessions

- Prevent or control forest pests or diseases
 - Oak wilt and Annosum rot root
- Invasive Plants
- Threatened Species
 - Wood turtle, goshawk, other forest-nesting birds
- Forest Productivity
- Water Quality
- Biomass



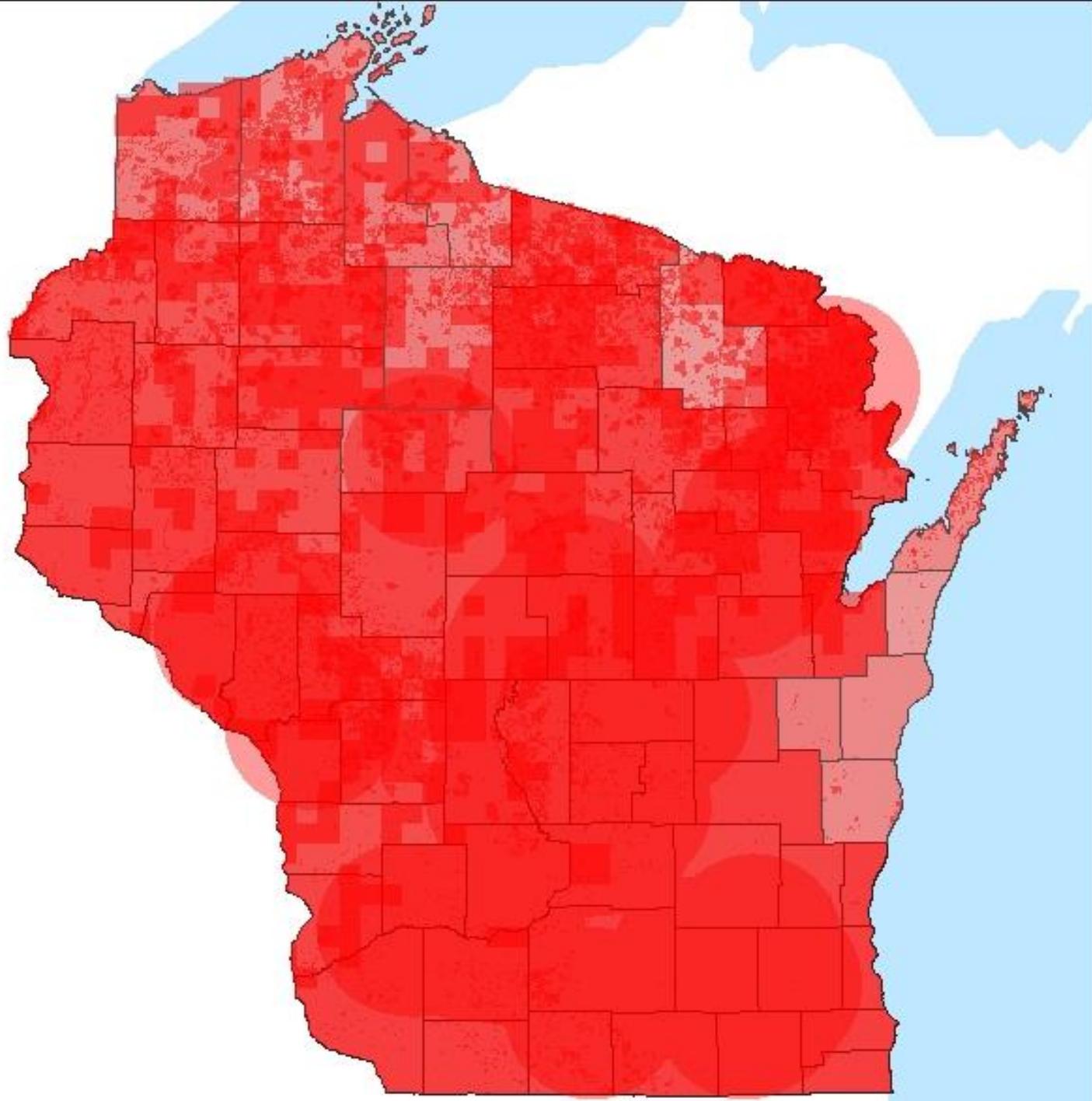






- January
- Oak Wilt
 - Annosum
 - Invasive plants
 - Wood turtle
 - Goshawk
 - Biomass
 - Frozen Ground
 - Combined





Combined



Frozen Ground



Biomass



Goshawk



Wood turtle



Invasive plants



Annosum

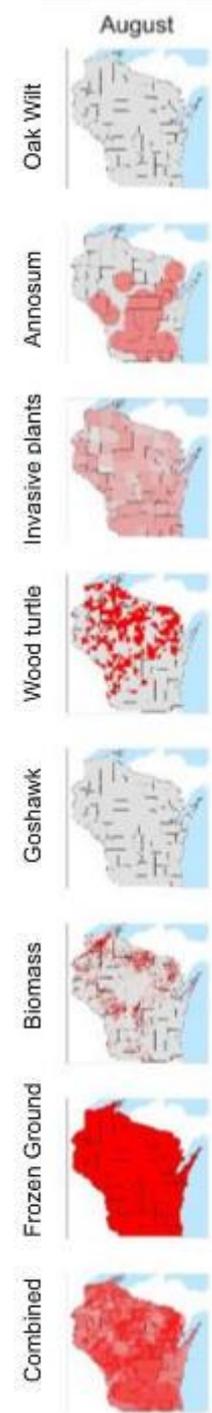
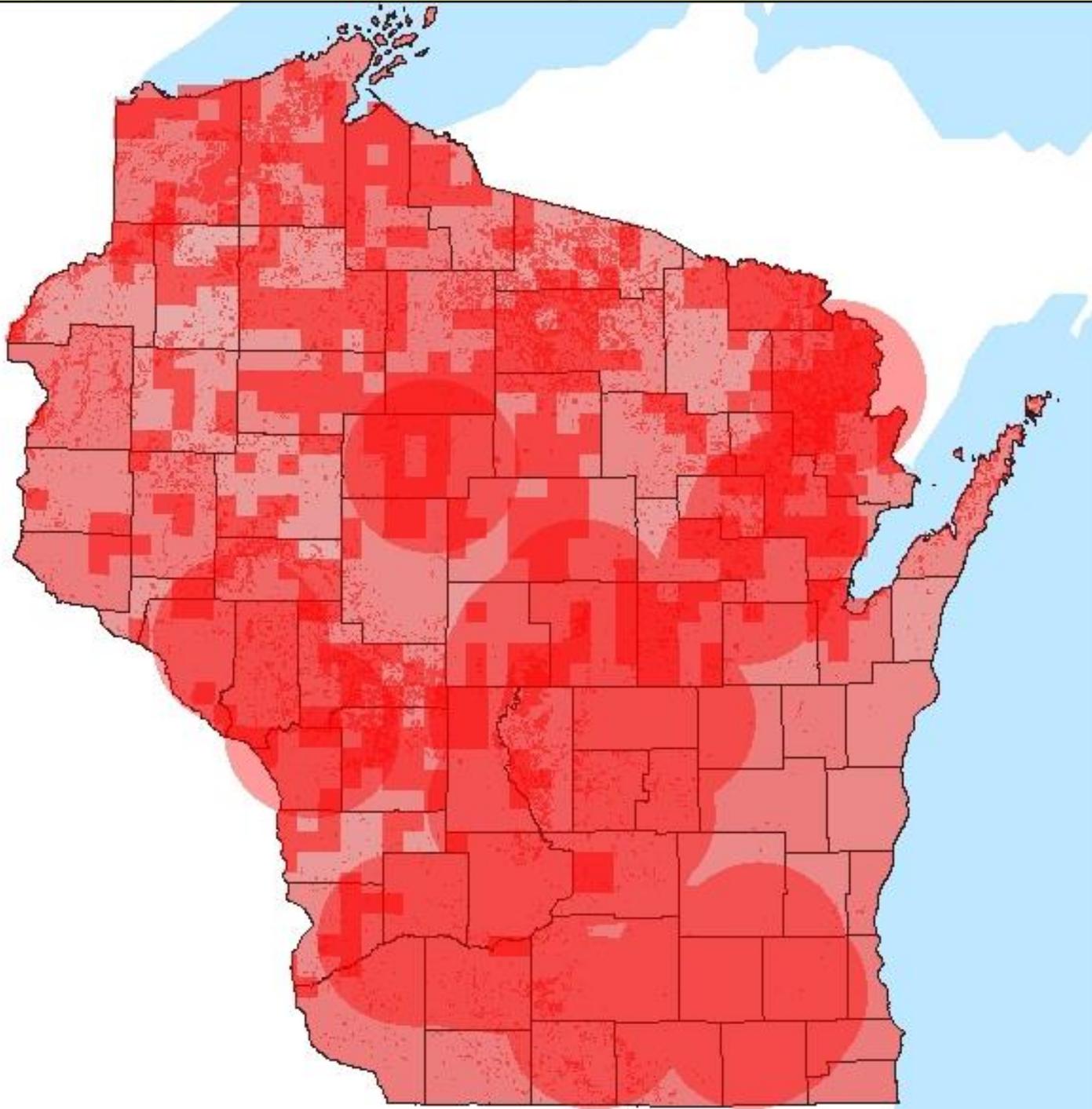


Oak Wilt



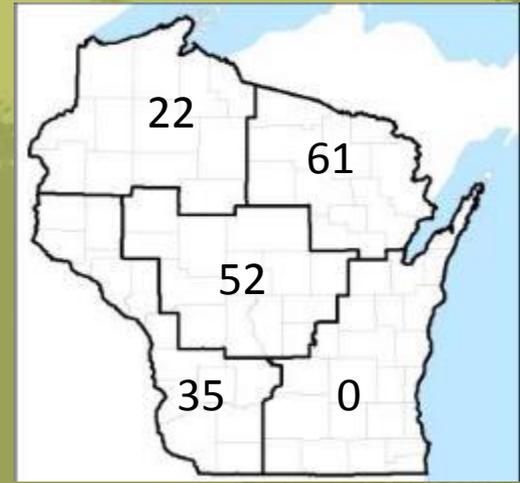
June





Case Studies

- 170 timber sale records from 23 counties
- Large and small private and public land owners
- Most sales listed months of allowable or prohibited operation
- Specific reason for timing constraints often not explicitly described
- Reasons for seasonal prohibitions varied greatly



Case Study Results

- 95% of harvests had a seasonal constraint
- Average timber sales allowed 6.5 months of operation
 - Particular months of allowable operation varied greatly by sale
- 94% did not allow spring logging
- 35% of sales required frozen ground
- 10% did not allow winter harvests



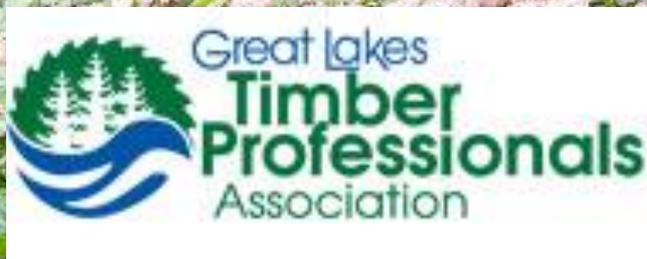
Case Study Results

- Pulp prices were significantly higher (\$49 to \$37) when July was included in the operable months
- Sawtimber prices were significantly higher (\$290 to \$257 per MBF) for sales that were restricted to frozen ground conditions
- Sale descriptions often did not specify why seasonal constraints were applied and rarely identified where multiple constraints overlapped each other



Timber Professional survey

- Estimated response rate of 12% (55 of 445)
- Respondents from 27 of 72 WI counties
- 77% identified as independent logging operators
- 23% identified as a mill or primary wood user purchasing stumpage

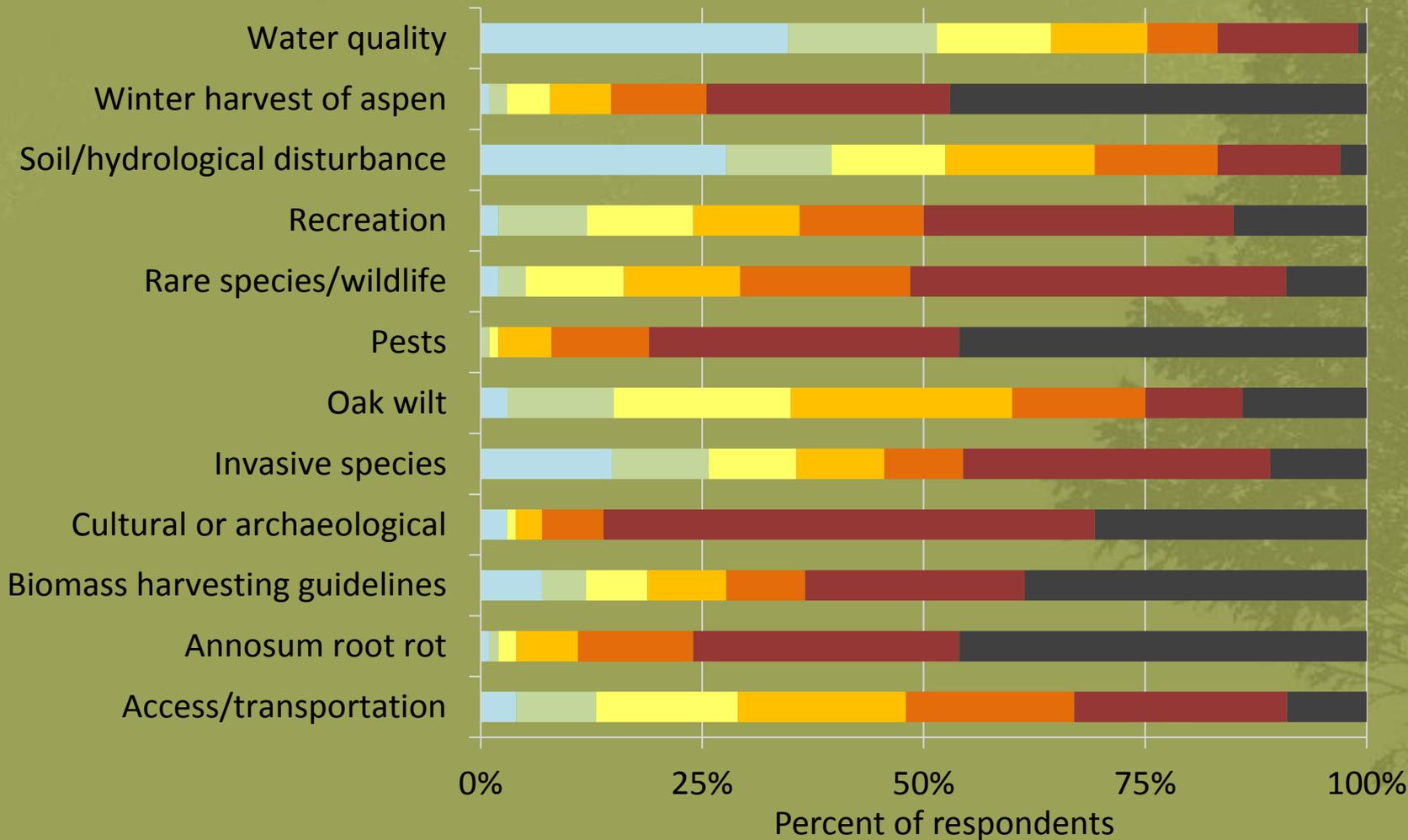


Forester survey

- Response rate of 65% (245 of 377)
- 54 of 72 WI counties
- 60% identified as public agency foresters
- 26% identified as consulting foresters working primarily with family forest landowners
- 12% work for a mill, logger, or industrial forest landowner

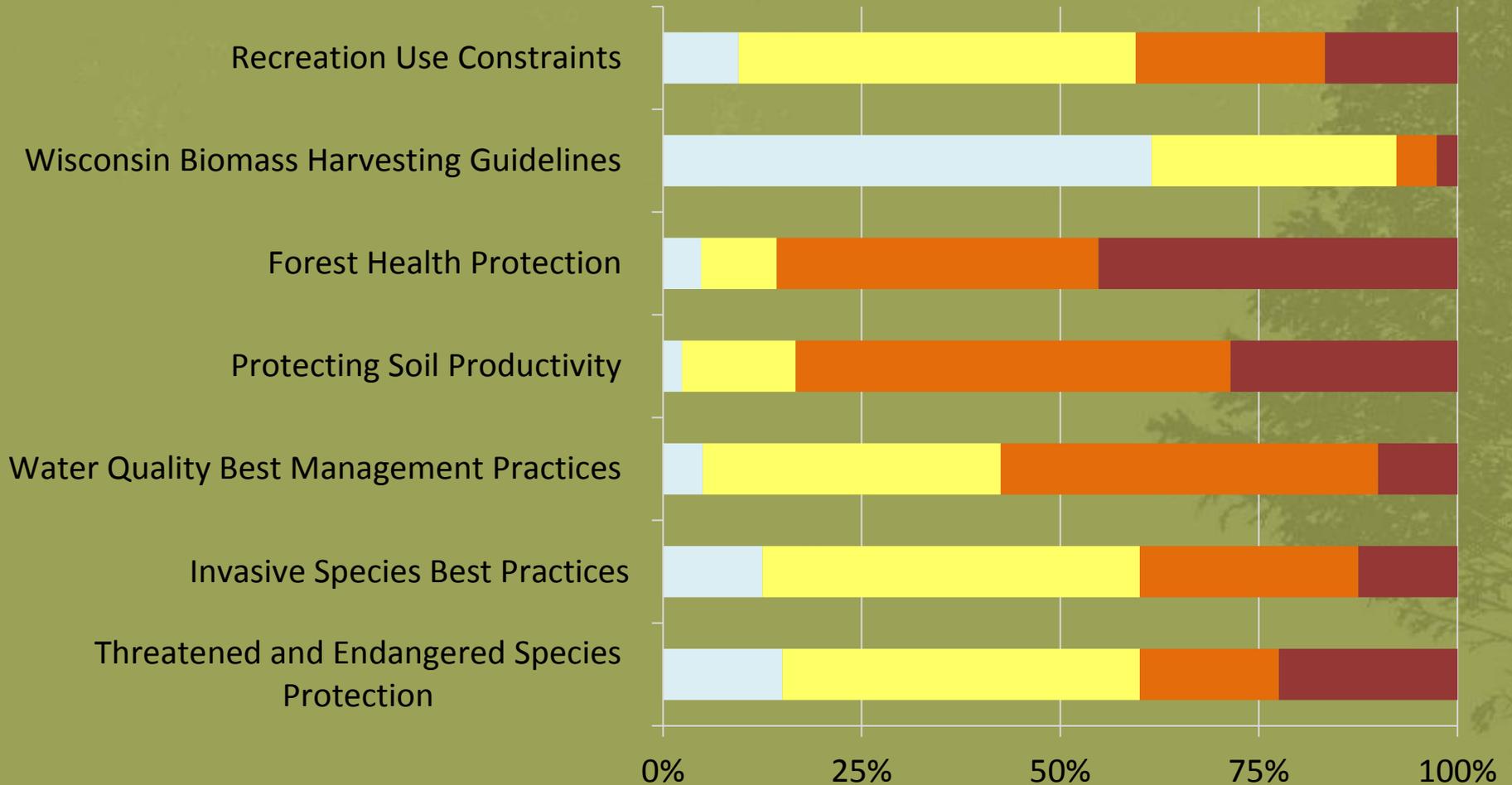


Percent of timber harvests foresters apply a constraint to during a typical year.



Magnitude of impact timber professionals perceive harvest constraints to have on their operations in a typical year

- Negligible effect on our operation
- Minor effect on our operation
- Moderate effect on our operation
- Major effect on our operation



Factors Affecting Stumpage Price According to Foresters Surveyed	Average Rating
Health of Wisconsin timber markets	4.6
Proximity of timber sale to mills	4.3
Species of timber for sale	4.2
Competition between loggers	4.1
Timber quality	4.1
Size of the timber sale	4.0
Health of the United States' economy	3.9
Seasonal timber harvesting restrictions imposed	3.8
Government regulations	3.5
Silvicultural prescription (i.e. thinning, clearcut, etc.)	3.3
<i>Average rating scale was developed using 1=not important, 2=of little importance, 3=moderately important, 4=important, 5=very important</i>	



Survey Patterns

Water quality and soil disturbance practices were rated as the most costly but also the most effective and most widely supported

Survey Patterns

T&E among least frequently applied but identified as a restriction with too much cost for the benefit by respondents

Survey Patterns

Foresters and timber professionals indicated professional judgment based on available science was the most important reason they applied constraints

Assessment of Economic Effects

- IMPLAN (IMpact analysis for PLANning)
- Model of how the economy is tied together
- Modeled statewide and regional data
- Forest based businesses and landowners classified in a diversity of industries
- Focused market shock on logging sector
 - Estimated expanding logging season by one month would increase production between 5-10% based on harvest case study data



Economic Effects Summary

Impacts Resulting from a 5% to 10% Increased Production in Commercial Logging Sector (in millions of dollars)				
Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	193 to 386	\$7.5 to \$15	\$8.3 to \$17	\$16 to \$32
Indirect Effect	102 to 204	\$2.6 to \$5.2	\$4.1 to \$8.3	\$7.1 to \$14
Induced Effect	64 to 127	\$2.7 to \$5.4	\$4.7 to \$9.5	\$8.3 to \$17
Total Effect	358 to 717	\$13 to \$26	\$17 to \$34	\$32 to \$63

- Compare to \$23 billion direct output of the entire WI forest industry
- Forest resources protected by constraints are difficult to measure but potentially total in the billions of dollars



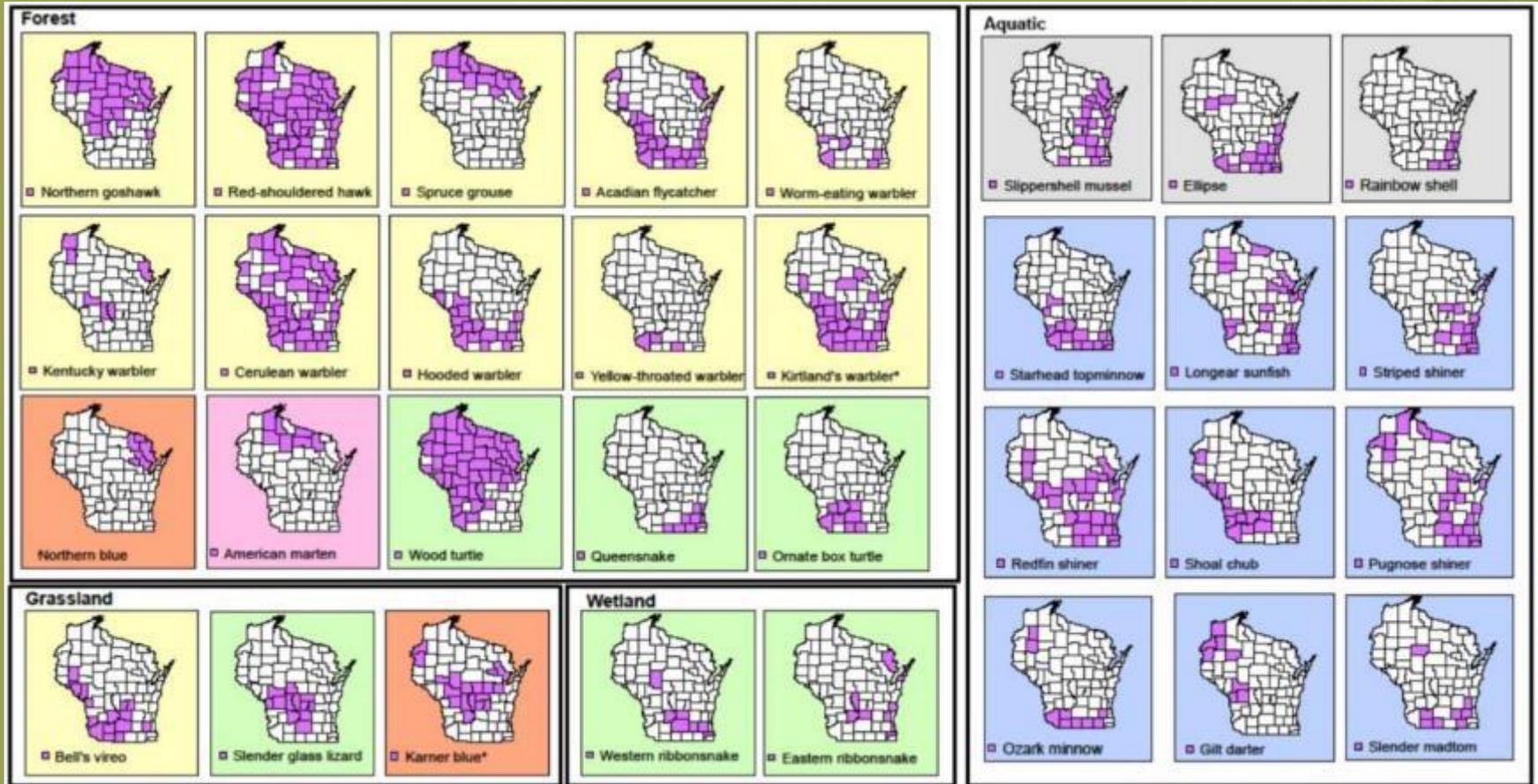
Assessment of Ecological Effects

The ecological effects of forest management constraints were evaluated in four categories:

1. Forest structure, composition and productivity
2. Wildlife habitat
3. Biodiversity
4. Water quality



Economic Effects Summary



Economic Effects Summary

Effect of Winter Harvest on Wildlife Habitat Indicator Species

SGCN Indicator Species	Forest Type	Short Term Effects		Long Term Effects	
		Effect	Rationale	Effect	Rationale
Birds					
Sharp-tailed grouse	AB	-	Could eliminate or degrade winter food and cover in riparian habitat	0	Winter harvest effects are equal to warm season harvest. Improved ground cover over time may favor the species.
Brown thrasher	OH, P	NP	Species not present during winter harvest	0, +	Winter harvest effects are equal to warm season harvest. Improved ground cover over time may favor the species.
Red-headed woodpecker	OH	-	Potential to disturb wintering territories and food stores	0, +	Winter harvest effects are equal to warm season harvest. Improved tree growth due to healthy soil may enhance food sources and nesting
Olive-sided flycatcher	LF	NP	Species not present during winter harvest	0, +	Winter harvest effects are equal to warm season harvest. Improved tree growth due to healthy soil may enhance food sources and nesting
Least flycatcher	HW	NP	Species not present during winter harvest	0, +	Indirect effects of winter harvest equal to warm season harvest. Improved tree growth due to healthy soil may enhance food sources
Veery	LF, HW	NP	Species not present during winter harvest	0, +	Winter harvest effects are equal to warm season harvest. Improved ground cover over time may favor the species.
Wood thrush	HW	NP	Species not present during winter harvest	0, +	Winter harvest effects are equal to warm season harvest. Improved ground cover over time may favor the species.
Black-throated blue warbler	HW	NP	Species not present during winter harvest	0, +	Winter harvest effects are equal to warm season harvest. Improved tree growth due to healthy soil may enhance food sources and nesting
Connecticut warbler	P	NP	Species not present during winter harvest	0, +	Winter harvest effects are equal to warm season harvest. Improved ground cover over time may favor the species.
Red crossbill	P	-	Species sometimes breeds in winter depending on cone crop	0, +	Winter harvest effects are equal to warm season harvest. Improved tree growth due to healthy soil may enhance food sources and nesting
Mammals					
Eastern red bat	HW, OH	NP	Migrates south for winter therefore not present during harvest.	0, +	Winter harvest effects are equal to warm season harvest. Improved tree growth due to healthy soil may enhance food sources and nesting
Northern flying squirrel	HW, P	-	Potential to disturb shelter trees and foraging habitat in vulnerable season.	0, +	Winter harvest effects are equal to warm season harvest. Improved ground cover over time may favor the species.
Woodland vole	HW	-	Active year round. Potential for direct take or, more likely, disturbance of habitat. Breeding may overlap	0, +	Winter harvest effects are equal to warm season harvest. Improved ground cover over time may favor the species.
Woodland jumping mouse	HW	0	Hibernates and not active during winter harvest. (Hibernacula usually in well drained soils and therefore	0, +	Winter harvest effects are equal to warm season harvest. Improved ground cover over time may favor the species.

Environmental Effects Summary

- Forest management constraints are expected to have positive repercussions on forest composition, structure and productivity particularly over the long term
- There is limited research on the efficacy of the forest management constraints, with the notable exception of water quality BMPs

Conclusions

Some of the forest management constraints with the largest impacts are not directly related to or controlled by existing regulations or policies. Some of these factors (including the length of frozen ground conditions) may even become more limiting, not less limiting, in the future.

Overall our study confirms the widely held view that timber professionals are shouldering a disproportionately large portion of the costs of forest management constraints

It may be possible to adjust forest management constraints so that they better balance positive and negative impacts; however, any adjustments must be based on sound science.

Thank you to all the individuals and organizations who provided data and helped make this study possible

Forest Stewards
**Guild**
putting the forest first