

Long-term and new Forest Service research on sustainable management of northern hardwoods

► PRESENTED BY CRISTEL KERN, PHD

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STATION

RHINELANDER, WI

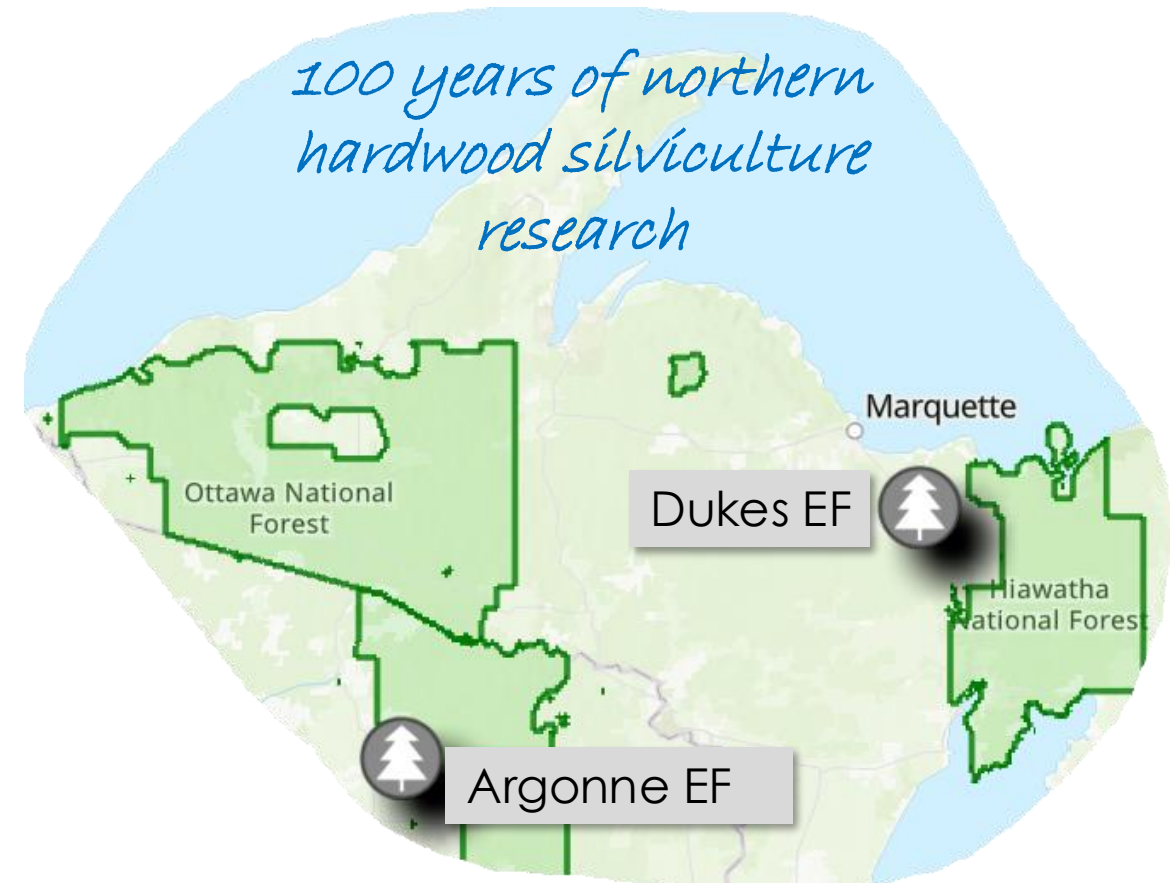
► SEPTEMBER 11, 2026 FORD CENTER FOREST:

EMERGING MANAGEMENT AND RESEARCH ISSUES
IN NORTHERN HARDWOOD FORESTS OF THE
WESTERN UP

Experimental Forests

<https://storymaps.arcgis.com/stories/c98214e996e14da09db46fa55cf007e9>

- ▶ Knowledge Gap:
 - ▶ Recover sawlog-sized NH forests
 - ▶ Contrasting examples of management
- ▶ Key Result:
 - ▶ Conventional Management Guides
- ▶ Take Home Message:
 - ▶ Demonstration/training areas
 - ▶ Long-term studies
 - ▶ Find foundational research results on [Treesearch](#) (free downloads)



Northern Hardwood Uneven-aged Management

Results - Early Findings

Erdmann and Oberg 1971

>> Residual Basal Area

High (90 ft²/ac)

**Less recruitment, diversity
More Tree Grade 1**

Medium (75 ft²/ac)

Best trade-off

Low (60 ft²/ac)

**More recruitment, diversity
Less quality - epicormics**

Old Study, New Findings

- ▶ Knowledge Gap:
 - ▶ What is a sustainable residual basal area for uneven-aged management?
- ▶ Early Findings:
 - ▶ 75 ft²/ac (or 80-ish ft²/ac + gaps)
 - ▶ Sweet spot for growth, mortality, recruitment, quality, ...
- ▶ Take Home Message:
 - ▶ Long-standing 80 rBA applications

Northern Hardwood Uneven-aged Management

Results – 65+ year Findings

Draper et al. 2021

>> Residual Basal Area

High (90 ft²/ac)

Tree Grade 1/residual &
defect

Medium (75 ft²/ac)

Best trade-off

Low (60 ft²/ac)

Quality increased,
defective removed

Old Study, New Findings

- ▶ Knowledge Gap:
 - ▶ What is a sustainable residual basal area for uneven-aged management?
- ▶ Recent Findings:
 - ▶ 60-75 ft²/ac similar outcome
- ▶ Take Home Message:
 - ▶ There's options in rBA

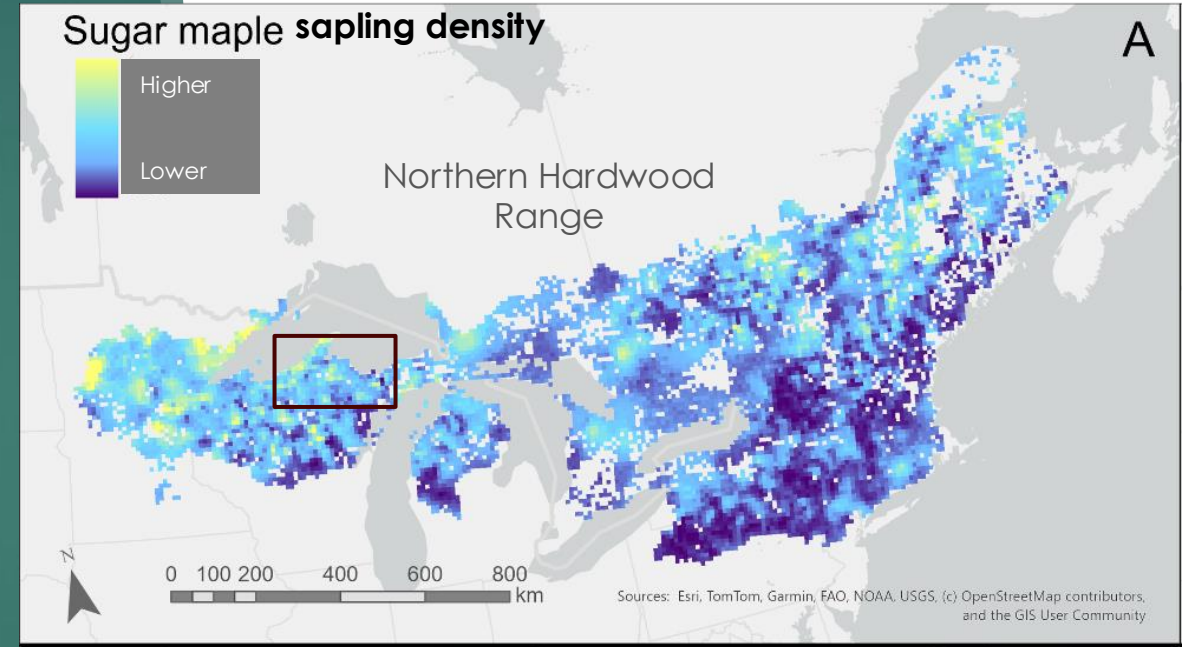


Old Study, New Findings

- ▶ Caveats
 - ▶ Focus on Timber Goals
 - ▶ Ecological, Social, & other Economic Variables are not analyzed here
 - ▶ Applied 7 times over 65 years
 - ▶ Regular 10-y cutting cycles
 - ▶ Initiated in Pole-size stands
 - ▶ Even-aged stand
 - ▶ Sugar dominated
 - ▶ Northern WI

New Research Studies – Large scale

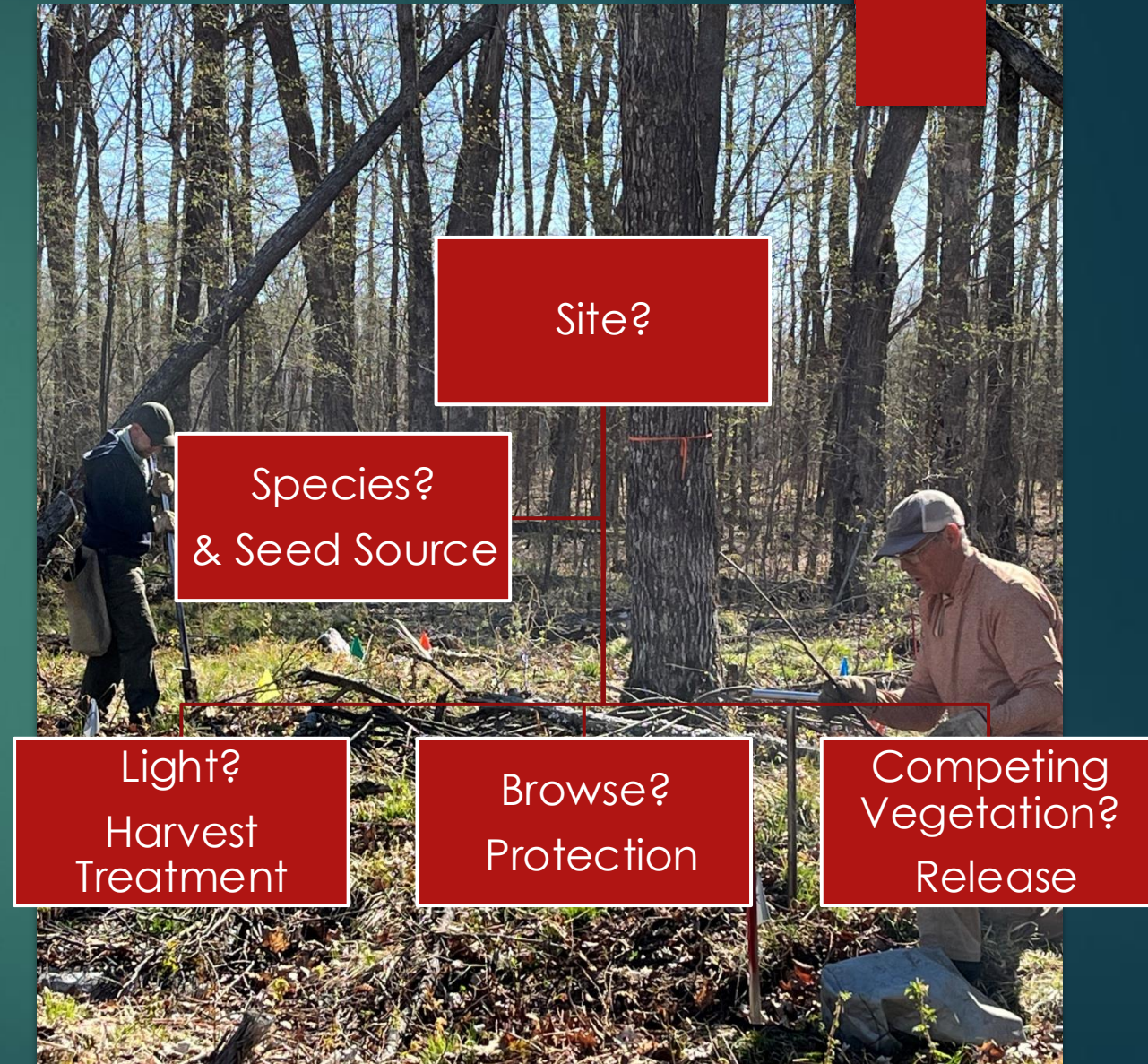
- ▶ Knowledge Gap:
 - ▶ Is the NH resource sustainable?
- ▶ (Prelim) Key Result:
 - ▶ Spotty potential stand and type changes
 - ▶ Management opportunities to promote recruitment – especially in vulnerable areas
 - ▶ Northern Hardwood Resilience project
<https://research.fs.usda.gov/nrs/projects/bil-assessing-wood-wildlife-carbon>



Bartlick et al. in-prep.

New Research Studies – Climate Adaptation

- ▶ Knowledge Gap:
 - ▶ Forest assisted migration in vulnerable (regeneration/recruitment) areas
- ▶ TBD Key Result:
 - ▶ TBD
 - ▶ DREAM study
<https://research.fs.usda.gov/nrs/projects/dreamallow>



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Thanks for listening!