



# Power in the Patchwork?

## Enhancing Biodiversity and Resilience by Using Summertime Patch Cutting to Create Uneven-Aged Northern Forests

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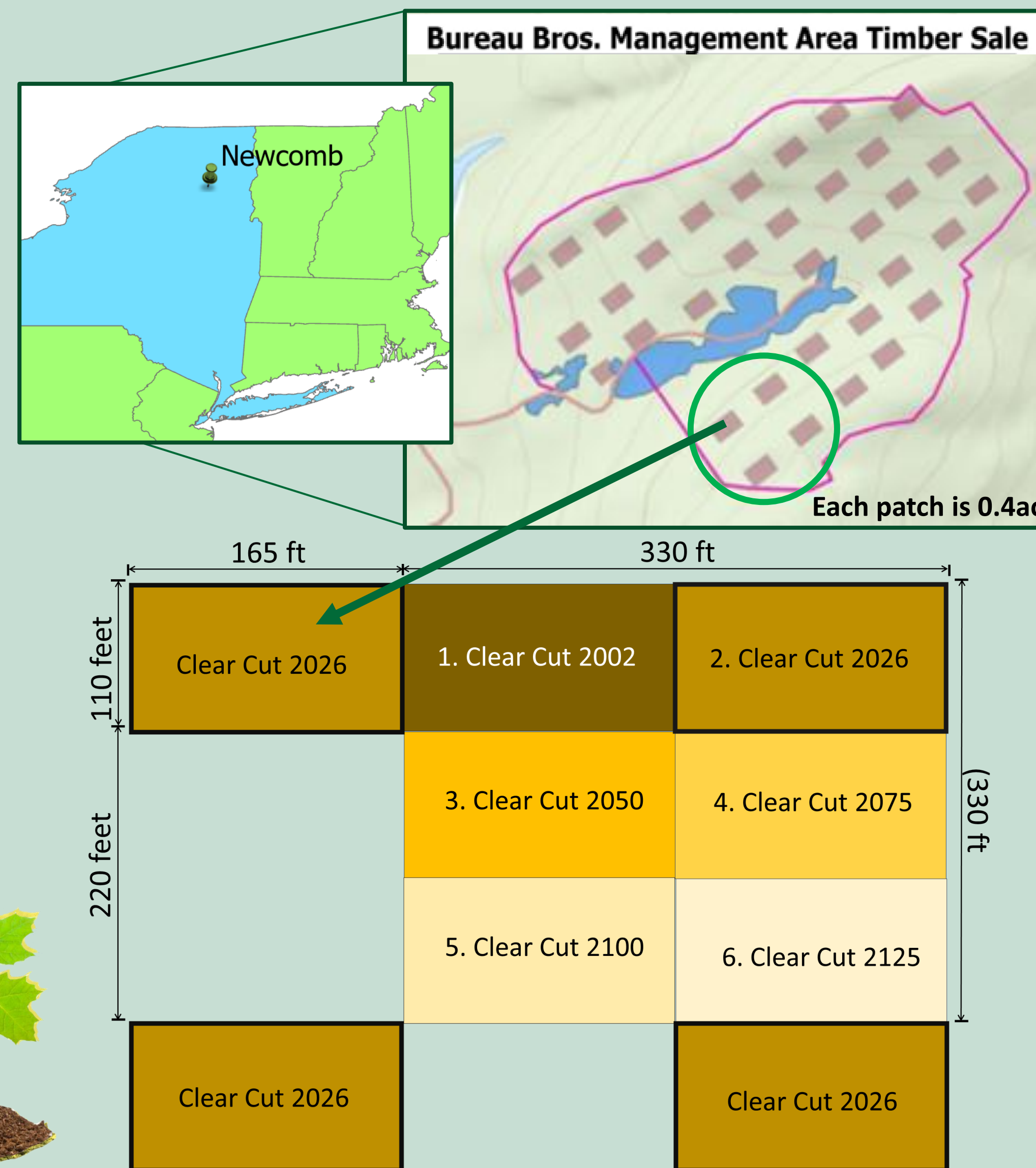


### Introduction

- Northern hardwood forests face **increasing stressors**: herbivory, disease, and climate change<sup>1</sup>.
- Managing forests for compositional and structural diversity may **increase forest resiliency**.<sup>2</sup>
- Traditional uneven-age silviculture can be difficult to apply and often abused (*i.e.*, high-grading), and **questions remain regarding the effectiveness of shelterwood and no-action approaches**.<sup>2</sup>
- Systematic patch clear-cutting every 25 years was initiated in 2002 (2<sup>nd</sup> entry planned summer 2026) at ESF's Huntington Wildlife Forest to create **diverse, uneven-aged (6 ages) stands**.
- Effects on **tree regeneration, birds, and beech-leaf disease** will be monitored.

### Driving Questions

- How does summertime patch clear-cutting affect tree regeneration dynamics in Northern Hardwood stands relative to traditional shelterwoods or no-action?
- How will this mosaic of forest age classes, and effects on structural heterogeneity within stands, affect the diversity and abundance of songbirds and ruffed grouse?
- Could summertime patch clear-cutting mitigate effects of Beech Leaf Disease (BLD)?



### Methods

**Study Area:** Huntington Wildlife Forest, Newcomb NY

**Bureau Brother's Turn:** 100-acre patch-clear-cutting (uneven-aged management). 1<sup>st</sup> entry in 2002.

**Treatments:** Patch-cut, shelterwood, and no action comparing effects on forest regen, wildlife, and disease.

**Seasonality:** 2002 cuts were in the winter, and 2026 cuts will be in the summer, enabling comparisons of effects on regeneration and interfering beech resprouting.

**Wildlife:** Ruffed grouse and species-specific songbird response quantified via passive ARU and active point-counts (5 locations for each per stand cores) in late spring (2026 pre-cut, 2027 post-cut).

**Vegetation:** Assessed using a nested plot structure sampling groundcover, seedling and sapling densities by species, canopy cover, and overstory basal area (30 plots per treatment, pre- and post- harvest).

**Beech Leaf Disease (BLD):** Monitored via beech bud sampling and visual assessment across treatment types.

### Preliminary Results from 2002 winter harvest

Herbivory data was recorded five times from the first entry of patch clear-cuts in 2002 until 2025. Herbivory exclosures and control plots were established within patch-cuts and areas of thinned mature forest.

- Patch clear-cuts showed **greater density of hardwood regeneration** by year 2025.
- Exclosed plots generally had greater amounts of regeneration showing that **herbivores are impacting regen**.
- Patch clear-cuts may be **dispersing regeneration** enough to reduce herbivory impact.



Aerial image of Bureau Brother's tract post harvest 2002.

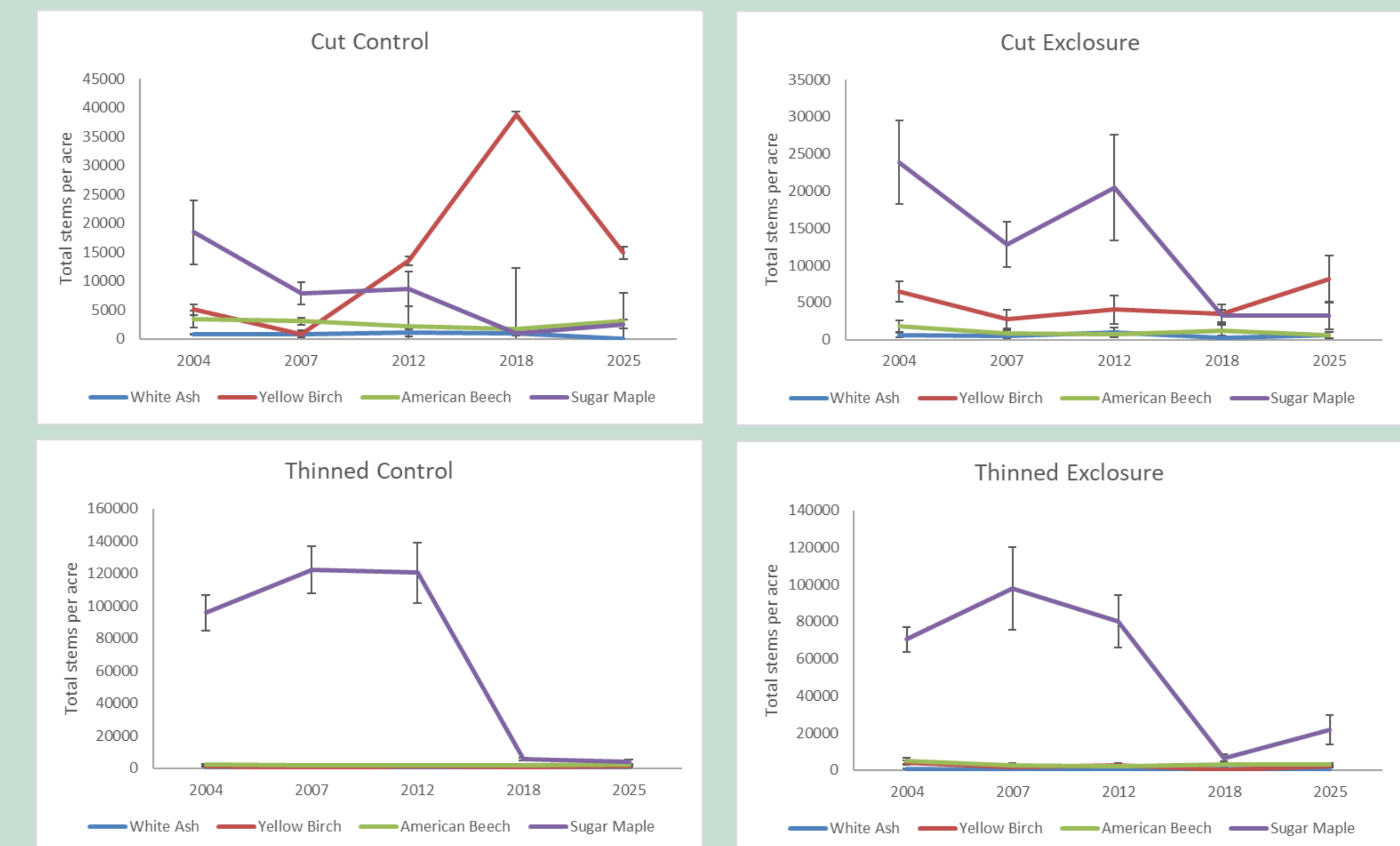
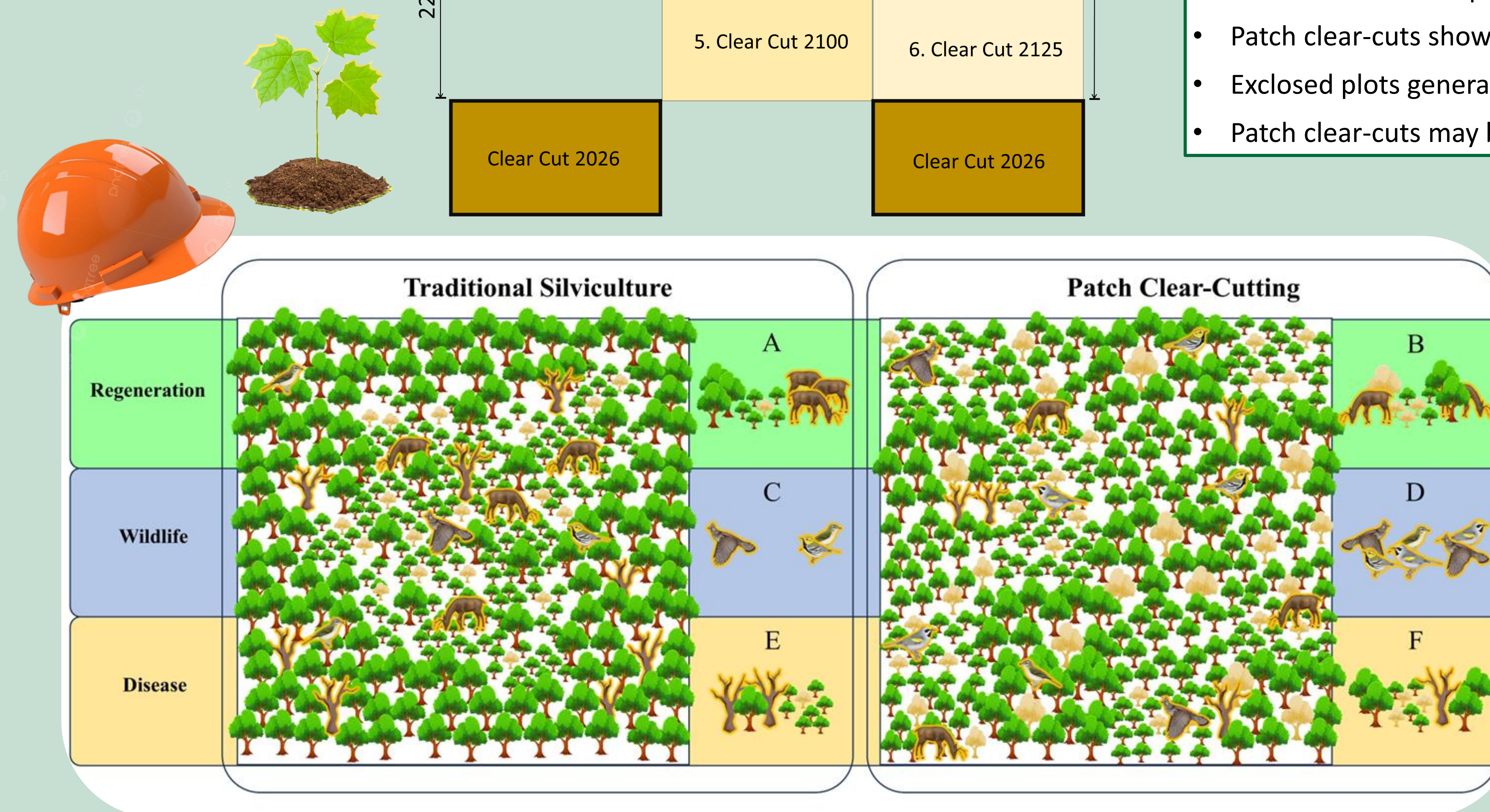
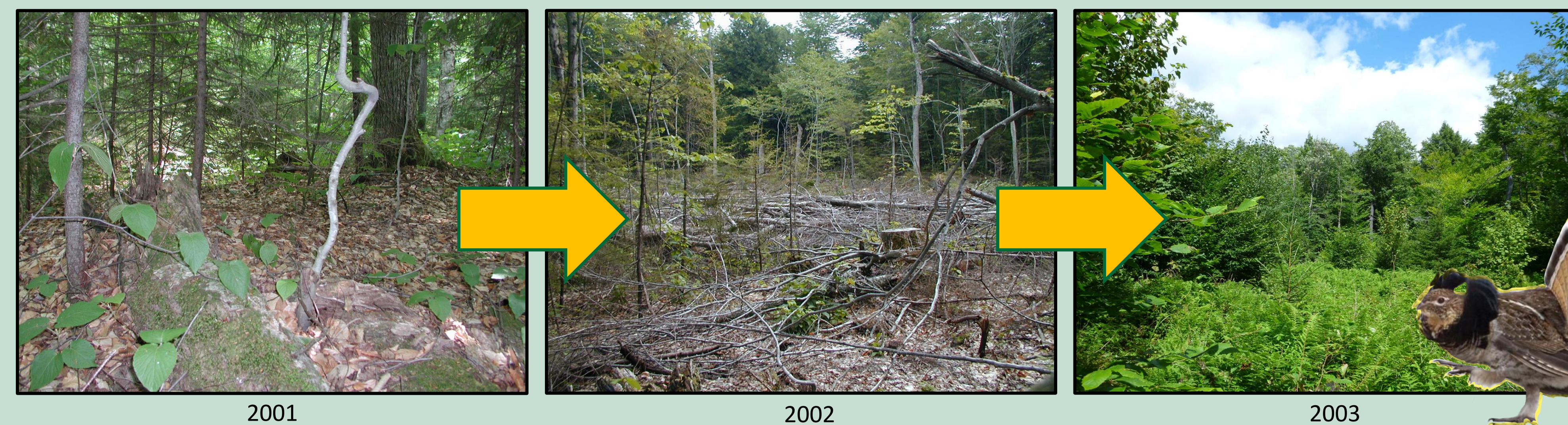


Figure 1. Comparison of the effect of herbivory exclosures on white ash, yellow birch, American beech, and sugar maple density in patch-cuts versus thinned mature forest on the Bureau Brother's Turn.

### Hypotheses: Patch-cuts will...

- Increase density and diversity of desirable tree regeneration, and herbaceous plant cover and density, by increasing structural diversity and spatially distributing ungulate browsing. Such responses will also be greater after summer than winter cuts due to less beech resprouting.
- Increase the diversity and relative abundance of songbirds and ruffed grouse by creating a patchy and well-distributed mosaic of habitat properties.
- Decrease prevalence and/or severity of BLD by distributing aggregates of disease prone trees among younger, more vigorous trees.



### Potential Impact

This project is in partnership with NGOs **New York Audubon Society** and the **Ruffed Grouse Society** and federal partners at **U.S. Forest Service** which allows for findings to be shared with stakeholders across the Northeast through community outreach and educational programs. This project's ecosystem approach of disseminating wildlife data with forest management information will help forest owners and managers "connect the dots" between forest management and forest health.

### Acknowledgements

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### References

<sup>1</sup>Butler-Leopold, P. R., L. R. Iverson, F. R. Thompson, L. A. Brandt, S. D. Handler, M. K. Janowiak, P. D. Shannon, C. W. Swanston, S. Bearer, and A. M. Bryan. 2018. Mid-Atlantic forest ecosystem vulnerability assessment and synthesis: a report from the Mid-Atlantic Climate Change Response Framework project. Gen. Tech. Rep. NRS-181. Newtown Square, PA: US Department of Agriculture, Forest Service, Northern Research Station. 294 p. 181:1-294. <sup>2</sup>Janowiak, M. K., A. W. D'Amato, C. W. Swanston, L. Iverson, F. R. Thompson, W. D. Dijak, S. Matthews, M. P. Peters, A. Prasad, and J. S. Fraser. 2018. New England and northern New York forest ecosystem vulnerability assessment and synthesis: a report from the New England Climate Change Response Framework project. Gen. Tech. Rep. NRS-173. Newtown Square, PA: US Department of Agriculture, Forest Service, Northern Research Station. 234 p. 173:1-234.