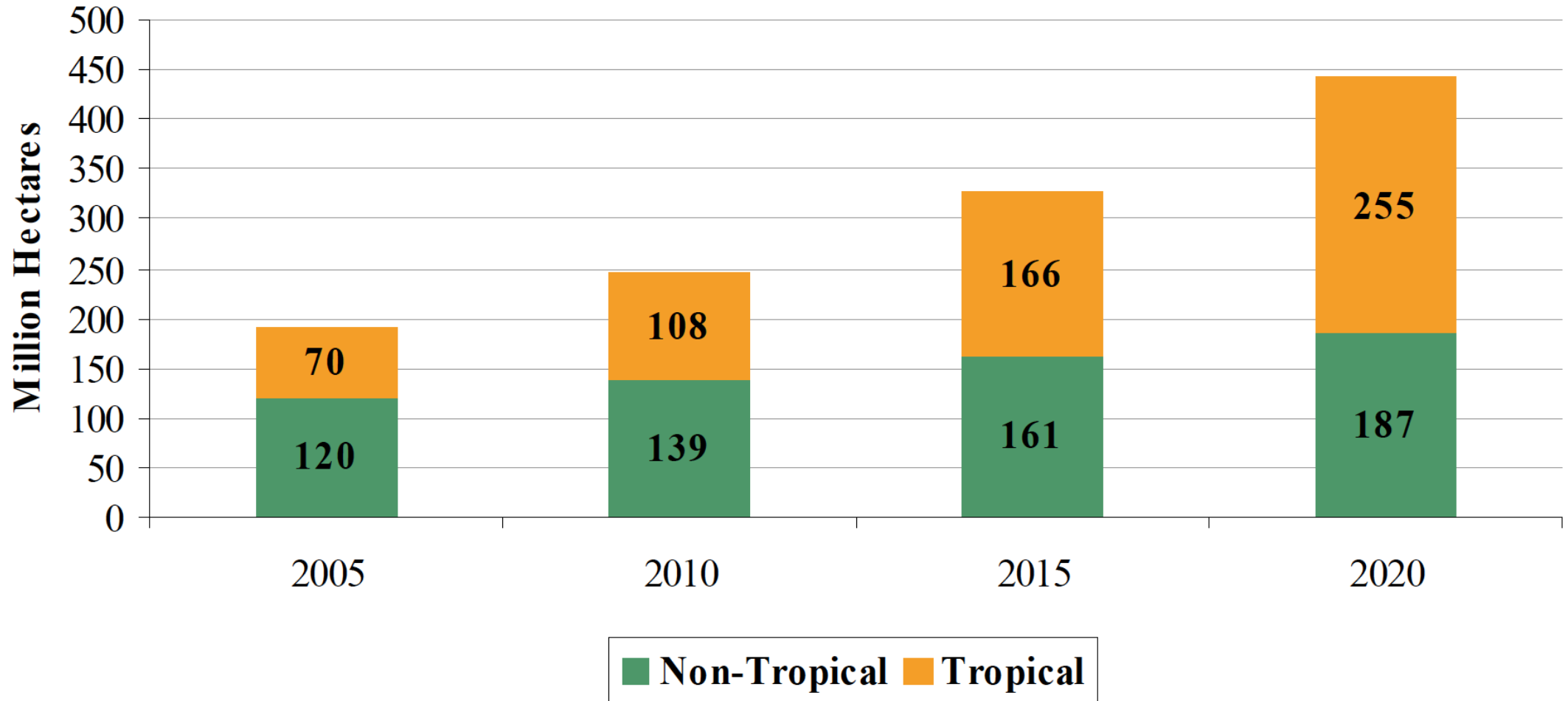


Biodiversity in Managed Early Seral Forests

Prof. Matt Betts

U. Kormann, J. Verschuyt, T. Stokely, J. Rivers, D. Maguire, D. Mainwaring, AJ Kroll
, S. Harris, B. Phalan





“In the future most of the wood supply to the industry will come from plantations”. – UN FAO 2006

- 
- An aerial photograph of a forested landscape. The foreground and middle ground are filled with dense, dark green coniferous trees. In the upper right, a large area of the forest has been clear-cut, revealing a reddish-brown soil surface. The background shows more forested hills under a hazy sky.
- Plantation forestry creates a steady, uniform and predictable supply of wood-fiber.
 - High production on a small land area *potentially* reduces harvest pressure on other forests.



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Study: Roundup Weed Killer Could Be Linked To Widespread Bee Deaths

by **Vanessa Romo** NPR Sept. 25, 2018 5:06 p.m.

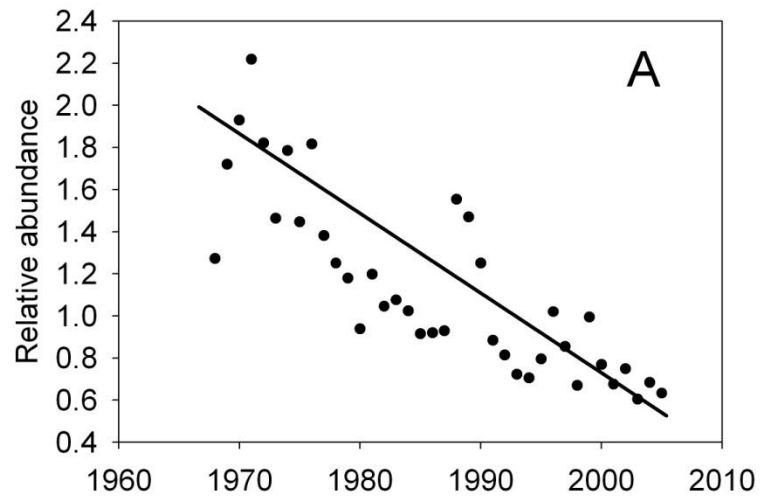
A



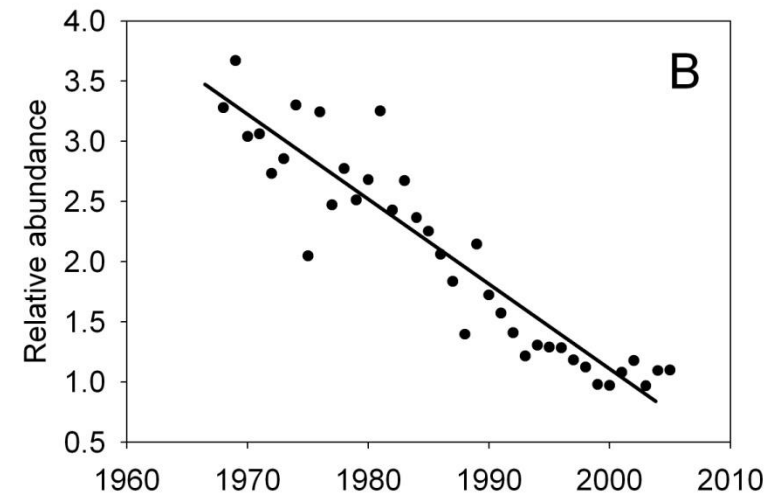
B



BBS Population trends for Oregon



Orange-crowned warbler



Rufous hummingbird

Study Question:

- **Does biodiversity decline with increased timber production in early seral forests?**

Confidence = low

Confidence = medium

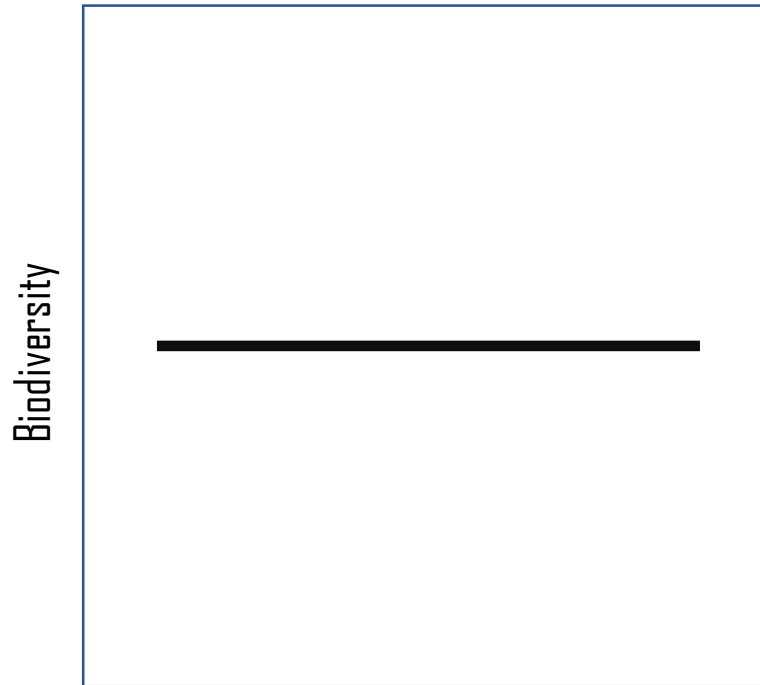
Confidence = high

Tradeoff



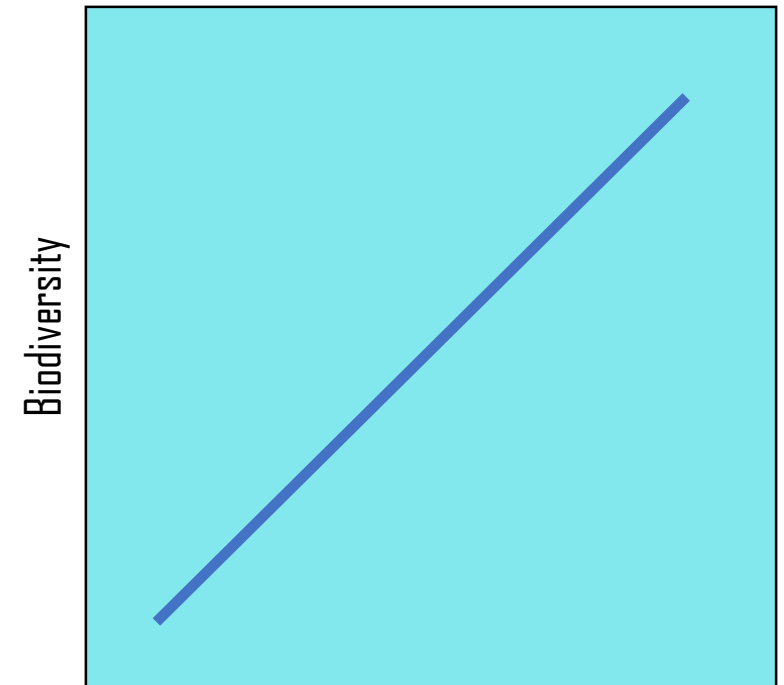
Timber production
or Revenue

Neutral



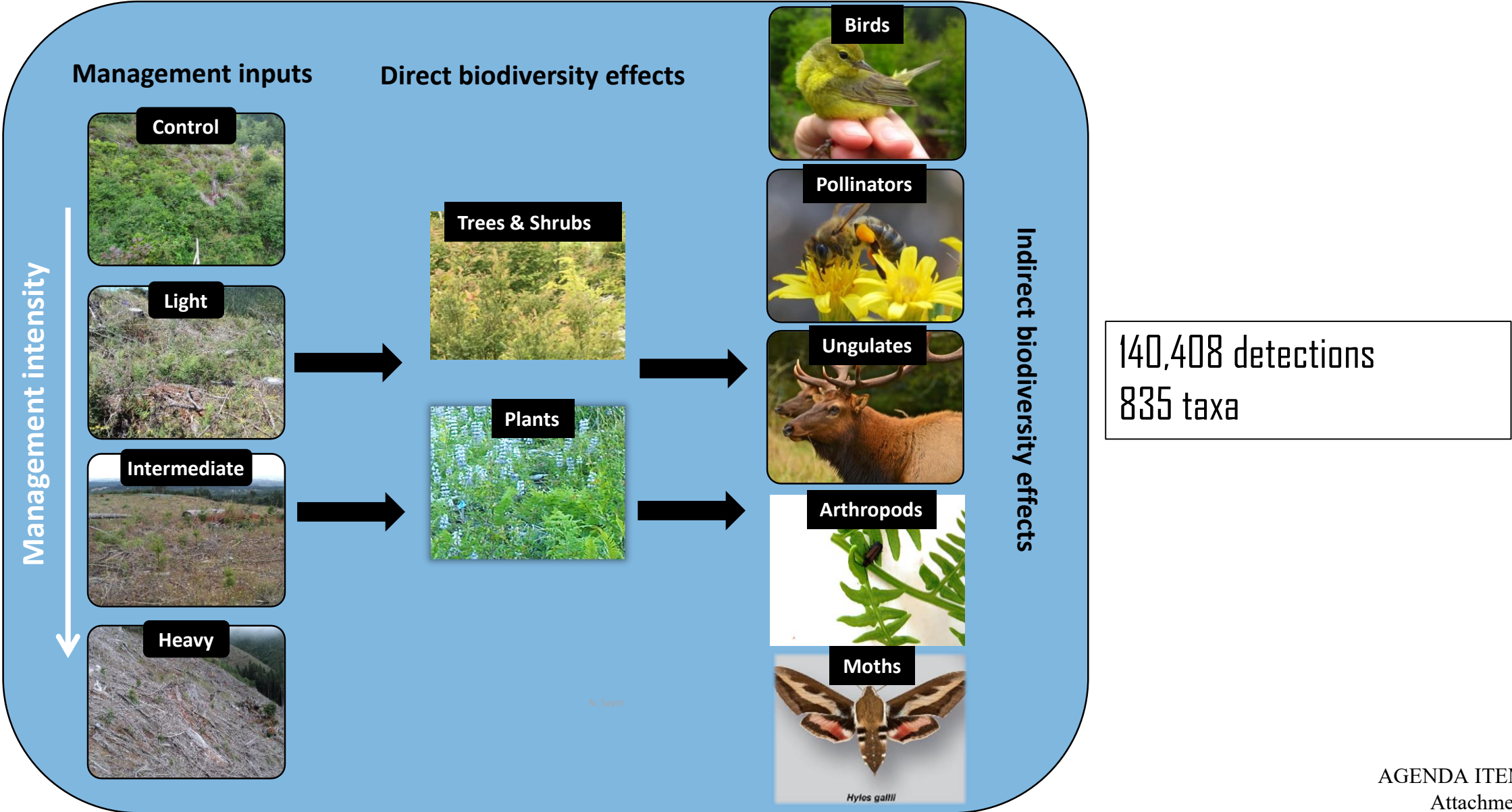
Timber production
or Revenue

Synergy



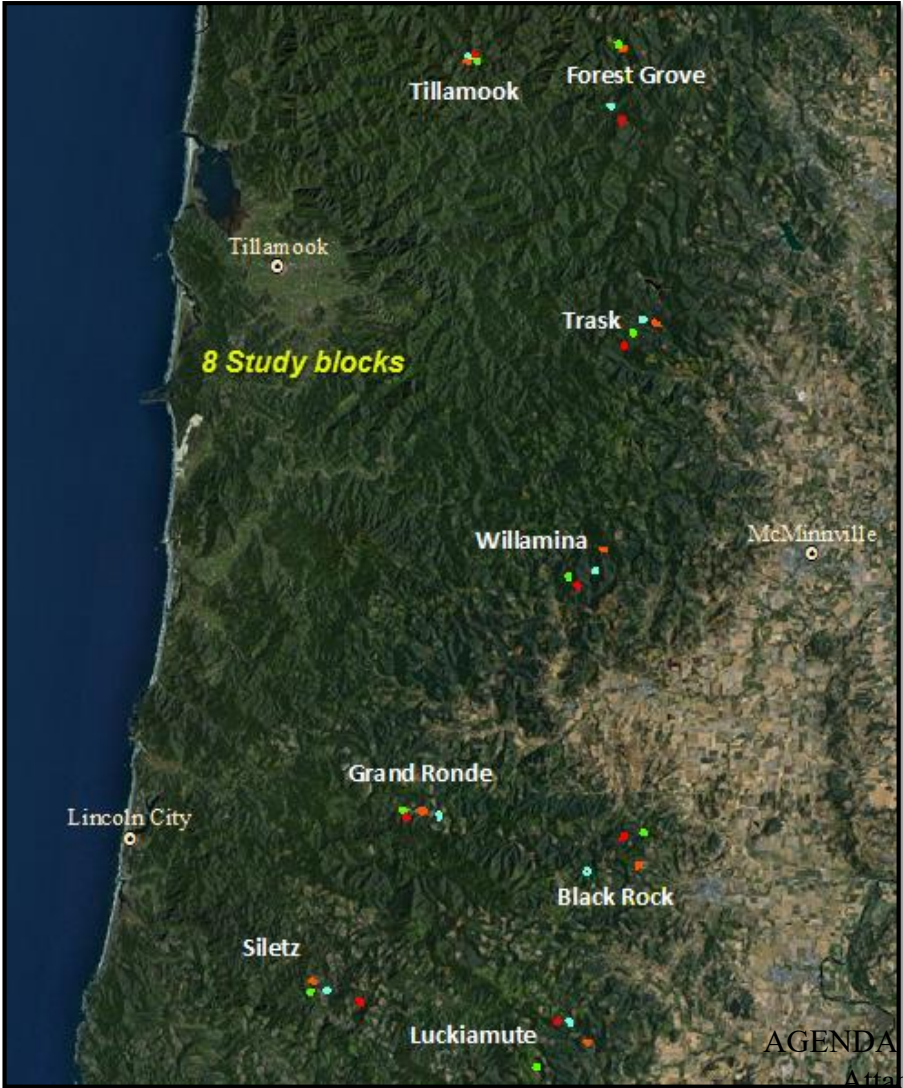
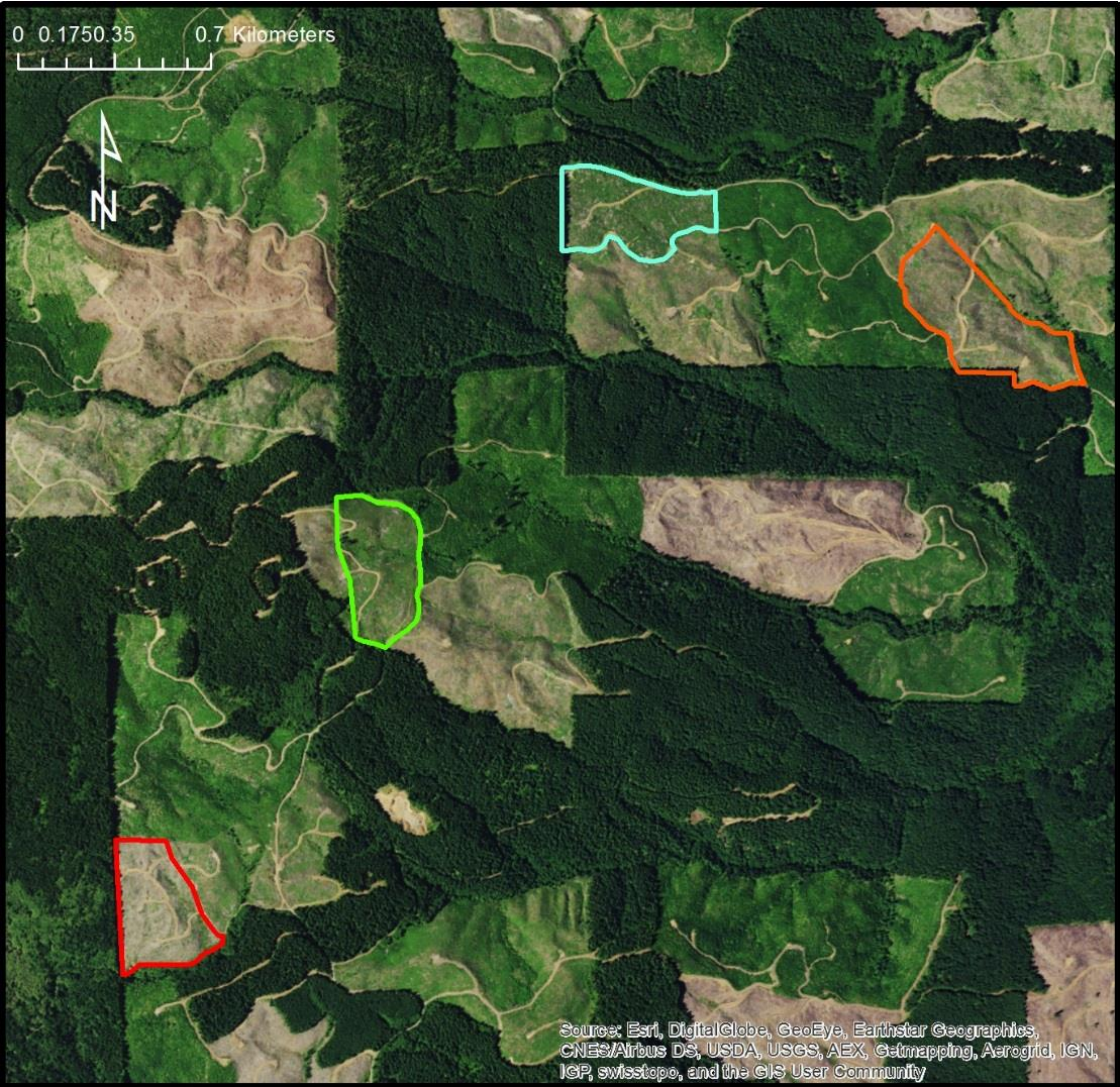
Timber production
or Revenue

Intensive management and biodiversity

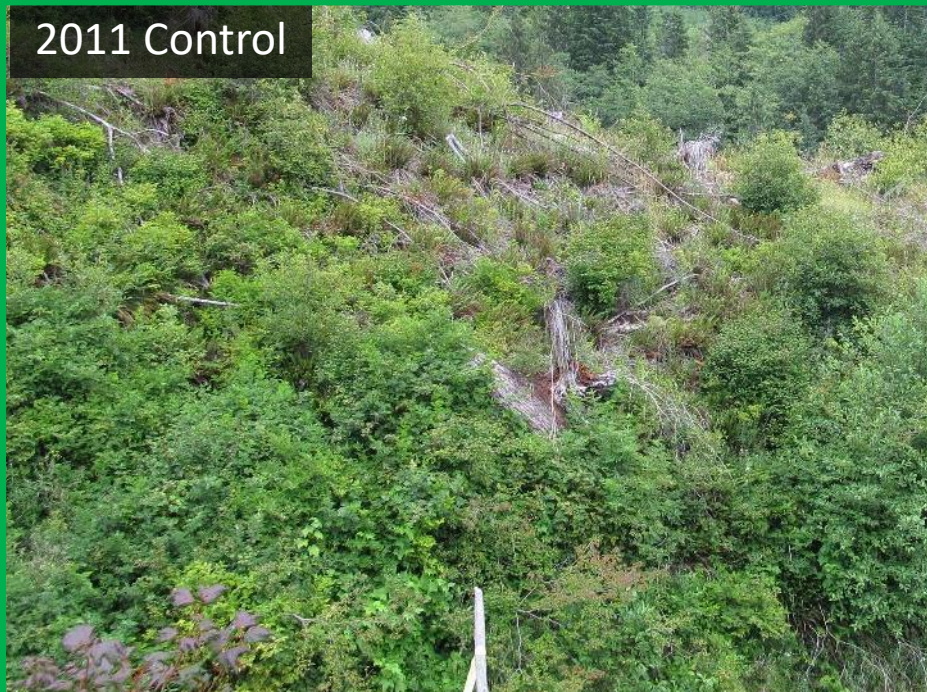


Study Design

8 blocks, 4 treatments per block ($n=32$)



2011 Control



2011 Light



2011 Moderate



2011 Intensive



2015 Control



2015 Light



2015 Moderate



2015 Intensive



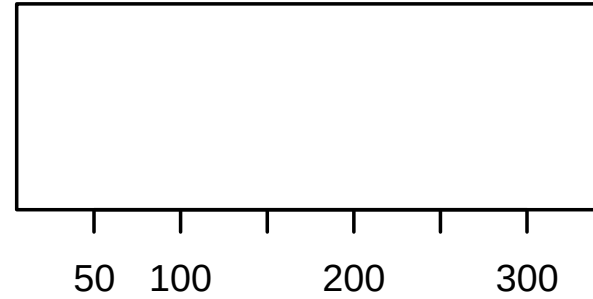
Results

Intensive forest management effects on biodiversity

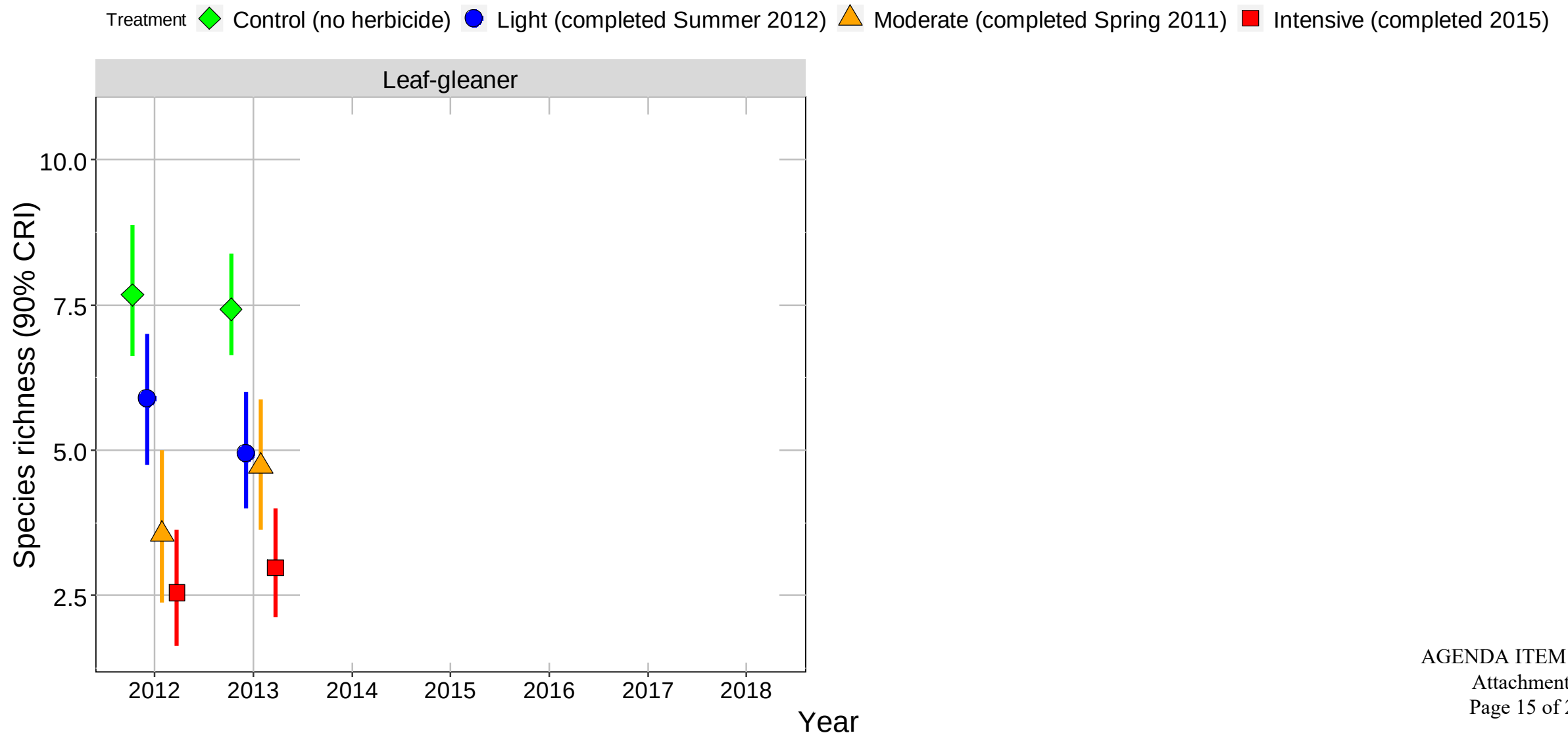
Woody plants
(46 species)

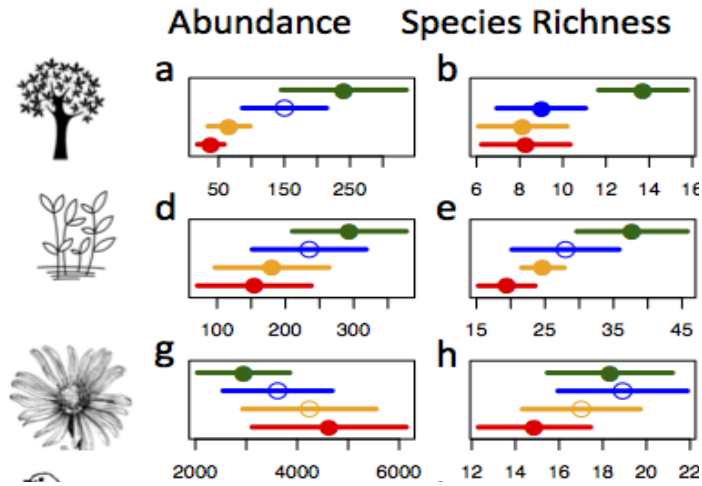


Abundance



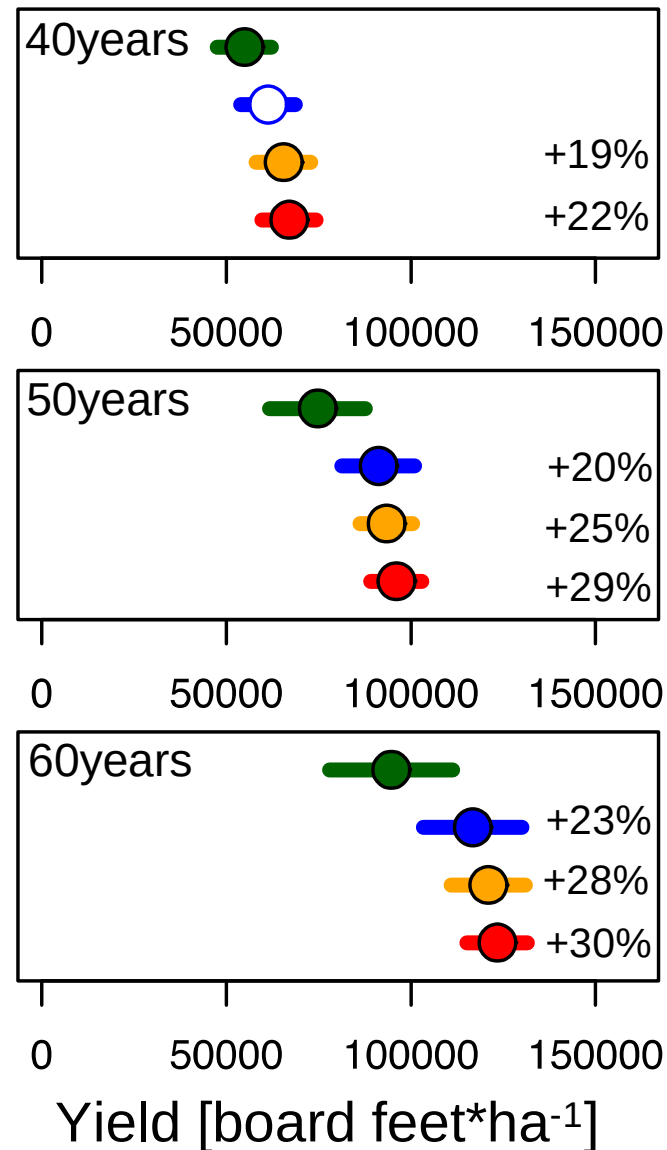
Individuals or Cover



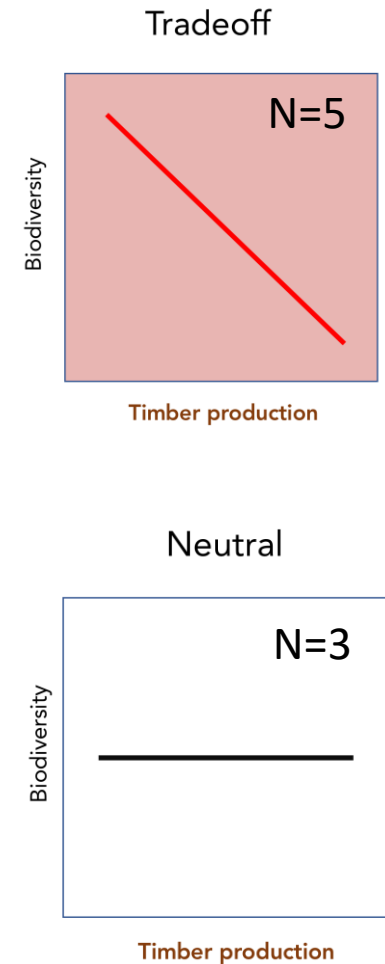
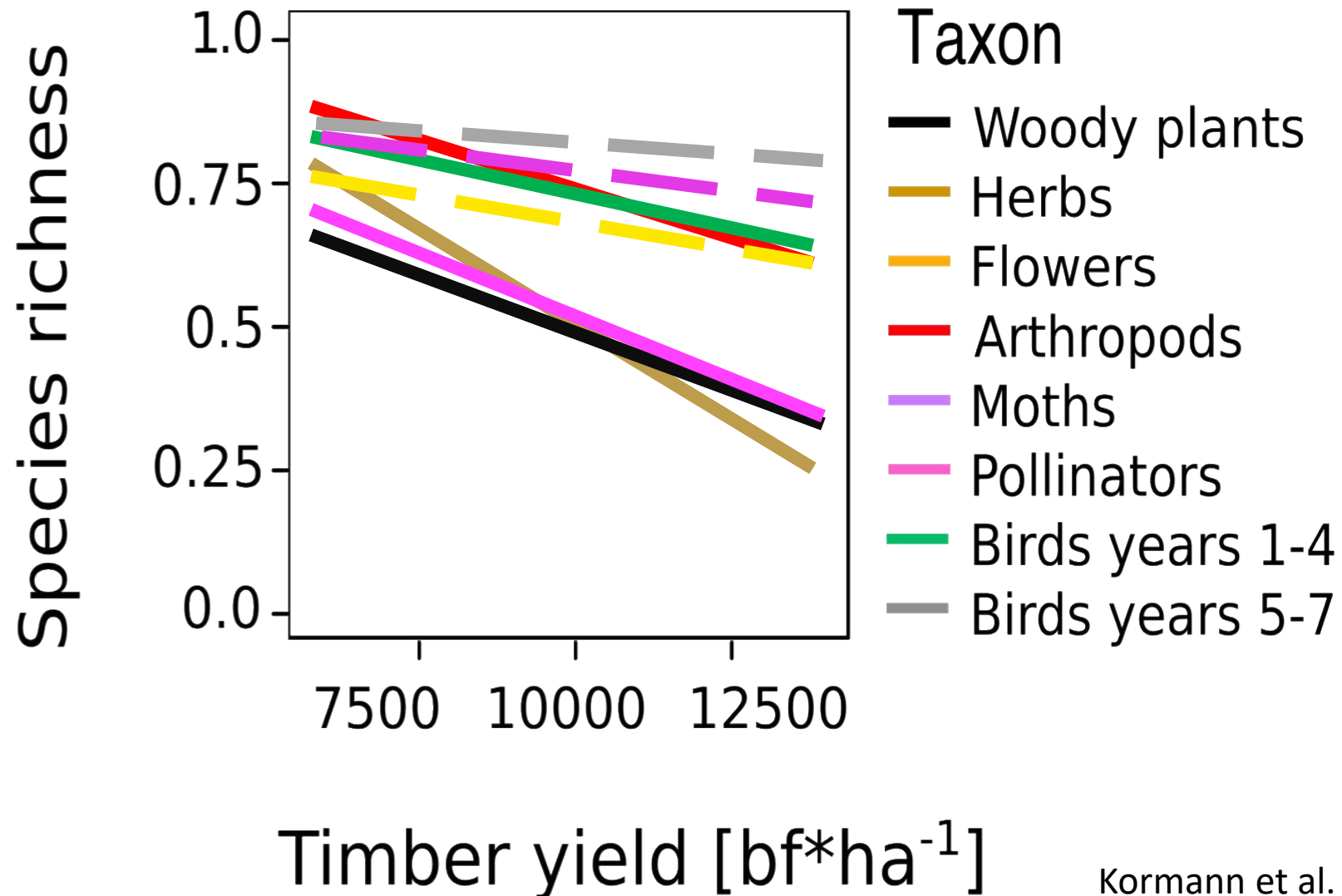


Overall:
18% fewer species
 (primarily plants,
 pollinators and LG
 birds)

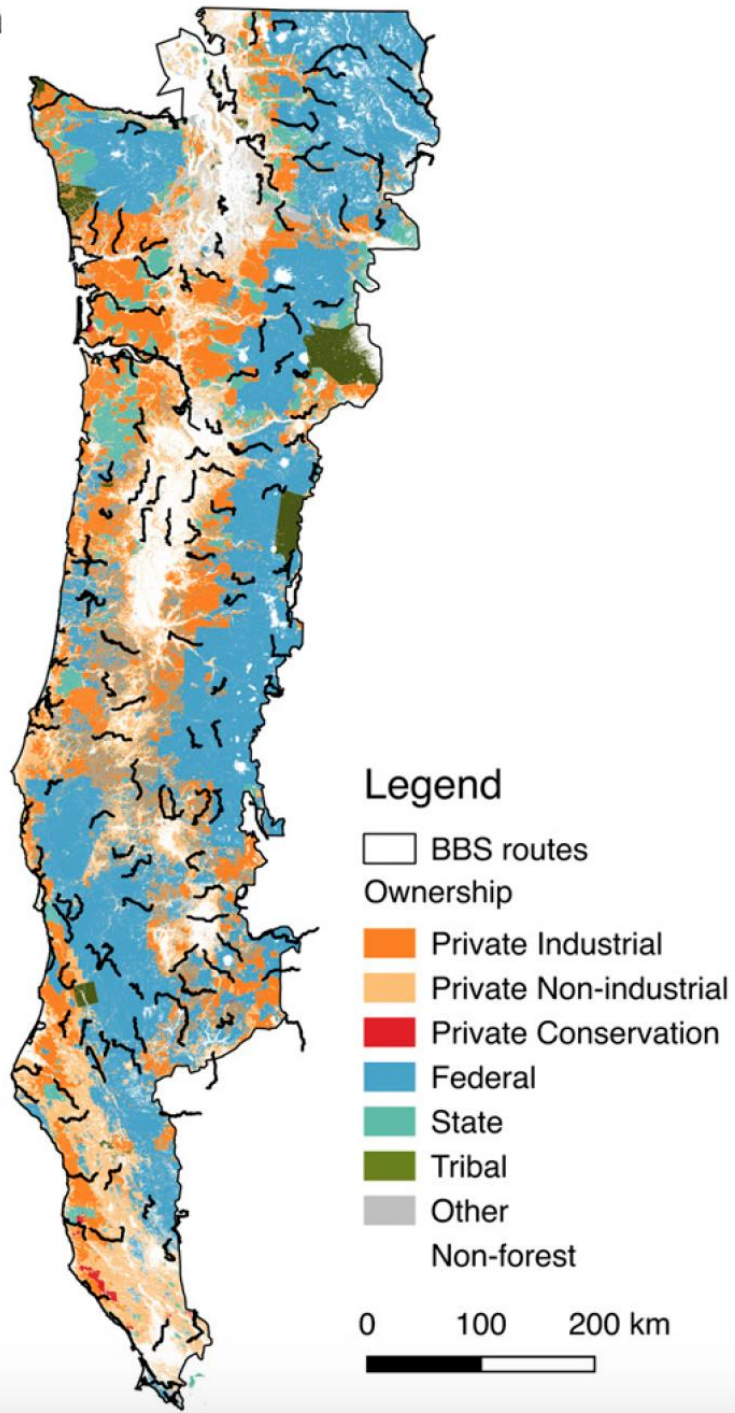
Intensive forest management effects on **yield**



Timber: Tradeoffs/ Neutral/Synergies



a

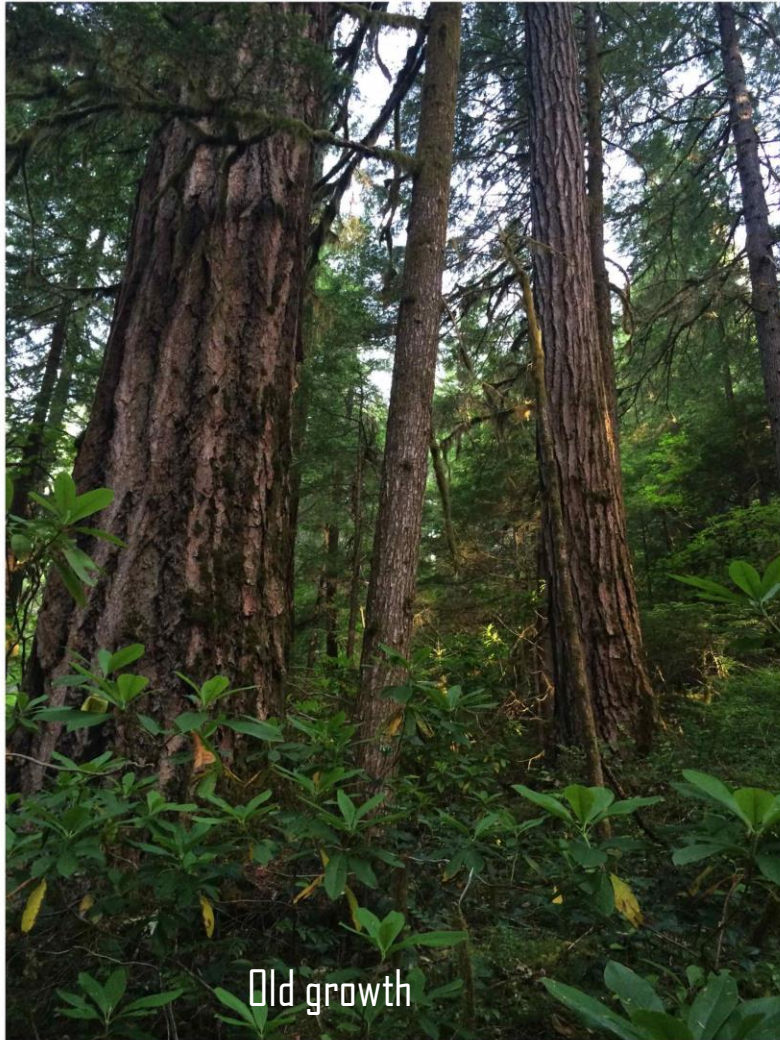


Bird population declines are greater for mature forest than early seral species

Confidence = medium

Old forest is $\sim 2.5^{\circ}\text{C}$ cooler than mature plantations, and may buffer wildlife from climate effects

a



b



Confidence = high

Frey et al. 2016 *Science Advances*, Betts et al. 2018 *Diversity and Distributions*

AGENDA ITEM B

Attachment 6

Distributions

Conclusions: Management recommendations

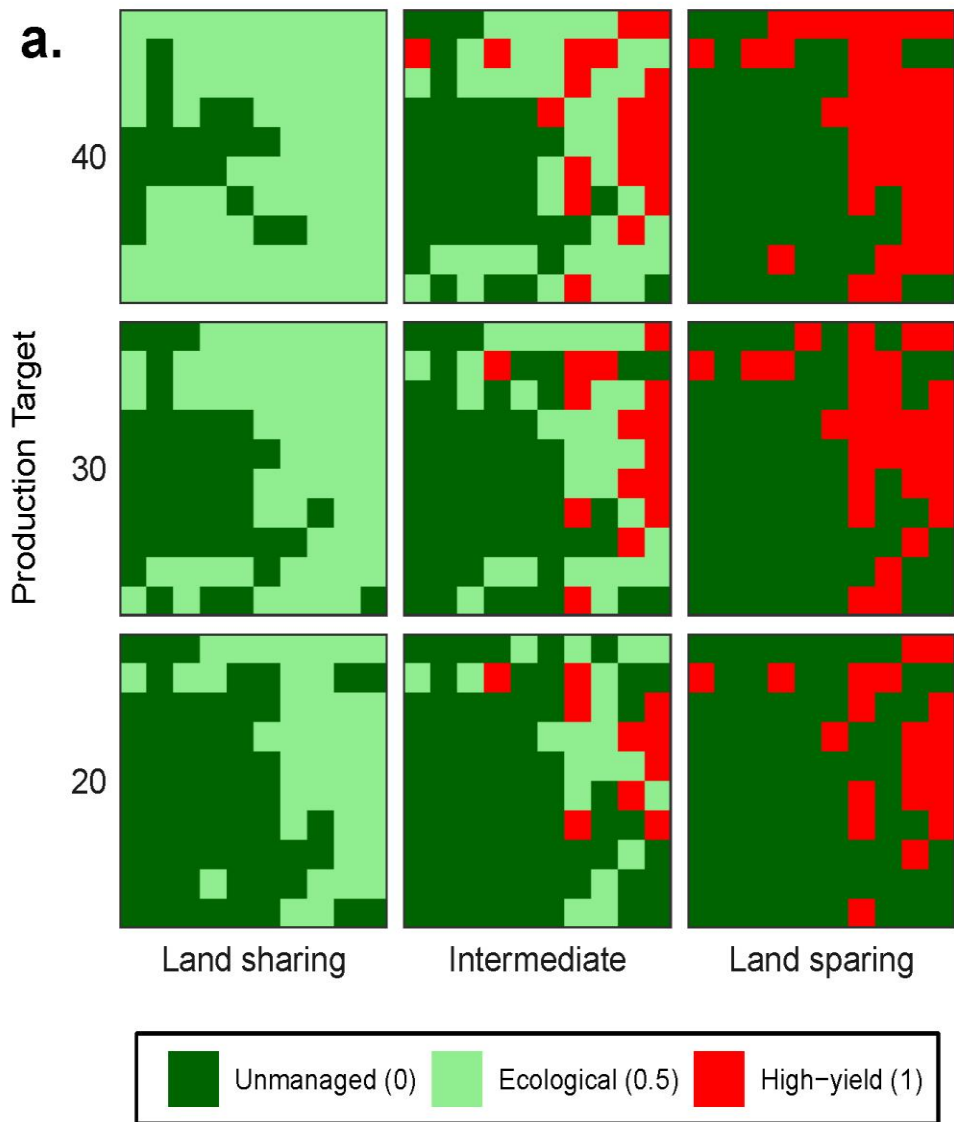
A “wicked problem”?

Objective	Decision
Contribute to early seral biodiversity in Oregon	No/ minimal spray



Research gap: The need for landscape-scale analysis and planning

- Thresholds in species tolerances?
- Tradeoffs at the landscape scale?



People and Partners

Participating/Partnering/Funding Institutions:

USDA-NIFA AFRI

Fish and Wildlife Habitat in Managed Forests (OSU)

National Council on Air and Stream Improvement

Institute of Working Forest Landscapes (OSU)

Noble Family Fund

Giustina Family Foundation

Weyerhaeuser Corporation

Hancock Forest Management

Oregon Dept. of Forestry

Oregon Forest Industries Council

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Jake Verschuyl
NCASI



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OSU



Doug Mainwaring
OSU



Jim Rivers
OSU



Thomas Stokely
OSU



AJ Kroll
Weyerhaeuser

Postdocs,
collaborators,
students



Heather Root
Dave Frey
Scott Harris
Ben Phalan
Mellissa Scherr

And over 20 undergraduate field technicians and interns