

**USDA/NIFA Program: *Managed Ecosystems***

**TITLE: Quantifying Trade-Offs Between Biodiversity Conservation and Timber Production in Intensively Managed Forests**

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**NON-TECHNICAL SUMMARY:** Biodiversity is under intense pressure from habitat degradation and loss in forests across North America. Intensive forest management (IFM), which relies on such practices as the use of herbicides and tree planting, is efficient for timber production, but results in simplified floristic composition and structure. As IFM becomes more prevalent, unmanaged early-seral forest is becoming increasingly scarce, but the consequences of this for biodiversity are poorly understood. In the Pacific Northwest and elsewhere this is hypothesized to have contributed to the rapid declines in songbird populations. We assess how IFM influences biodiversity at continental, landscape, and local scales with three complementary research objectives. Our approach combines results from the three scales to find economically efficient solutions. We have firm collaborative commitments from six major landowners (government and industrial) to provide sites for a large-scale replicated experiment to contrast how intensive versus non-intensive management influences species abundance and reproduction. We also have an unprecedented dataset in-hand (>20,000 bird count locations) for a continental-scale effort to test for thresholds in bird populations as a function of IFM. Finally, we will investigate the ecosystem services birds provide in controlling insect populations and therefore herbivory on trees. Results will be integrated into a decision support system to quantify the economic trade-offs of alternative approaches, and to inform managers how intensive forestry practices impact biodiversity. This work is focused on birds, widely used bio-indicators as they provide critical ecosystem services, respond rapidly to habitat perturbations, and may reflect changes at lower trophic levels.



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