Evaluating Alternative Structural Retention Practices

A Pacific Northwest focused experimental forestry study to address the question:

“What do you get for what you leave behind?”
Structural Retention
Differences from prior research

• Total retention/ac constant across treatments

• Operational harvest unit sizes and arrangements

• Incorporate operationally feasible structural enrichment
Experimental Design

Current operational; Treatment 1
Control

Treatment 2

Treatment 3

Treatment 4

Treatment 5
Study Locations

- 10 blocks
- 5 treatments/block
- Harvest was complete for all stands in early 2015
- Over 4000 structures

★ You are here
In Collaborative Partnership

- Sean Sultaire
- Dr. Gary Roloff
Structural Retention
Study Taxa
Implications for Forest Carnivores

Are there retention arrangements that provide better support for the prey species of forest carnivores?

How does the arrangement of required structural retention affect:
- Plant communities
- Small mammal prey density at the stand scale
- Prey species diversity
Structure Longevity and Plant Community
Study Objectives

• Estimate how density of common small mammal species varies with retention treatment
  - How much biomass of prey is on the landscape?

• Estimate how species diversity of small mammal species varies with retention species.
  - What is the range of prey items available to forest carnivores?
Small Mammal Sampling

144 traps/stand, 96 Sherman, 48 Tomahawk
Retained Structures
- Green Tree
- Created Snag
- Small mammal patch grid
- Small mammal harvest grid
Results

Summer 2017: 30,680 trap nights, 3,690 Captures, 1844 individuals, 26 species total

Deer mice, Townsend’s Chipmunk, Creeping Vole, & Trowbridge’s Shrew > 90 % of captures
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Deer mice

Peromyscus maniculatus

N=1082 animals, 2101 detections
N = 304 animals, 472 detections
Bushy-Tailed Woodrat

N=28 animals, 42 detections
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Density-Diversity Tradeoff?

May not be able to maximize both diversity and biomass of prey.
Implications for Forest Carnivore Conservation

- Prey most abundant in open or fragmented habitat
- Preferred prey items appear rare
- Aggregated upland retention support lowest prey base
Future Directions

- Understand how landscape context impacts efficacy of treatments
- Factors that determine rare species occurrence
- Relationship between vegetation and small mammal community

Credit: Laura Six, Plant Ecologist, Weyerhaeuser
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Questions?