Vegetation Biodiversity in Coastal Oregon Forests

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- A new kind of vegetation map
- Uses in CLAMS
- Current vegetation biodiversity

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A Novel Way to Map Vegetation

Data from plots (FIA, CVS, BLM, OG)

Spatial data in GIS

Remote sensing
Climate
Geology
Topography
Ownership

Vegetation maps (1996)

A ‘tree list’ for each pixel

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CLAMS vegetation map...somewhere SW of Eugene, 1996
How good is the CLAMS vegetation map?

• Assessed accuracy using a variety of methods

• Excellent representation of regional patterns and variability, landscape proportions

• Reasonable representation of fine-scale pattern, inexact for specific sites, similar to other satellite-based maps

• Rare species and habitats not well represented

• For more information:
  
  – Posters

Uses of Vegetation Map in CLAMS

- Initial conditions (1996) for landscape simulations
- Response models for wildlife, aquatic, timber
- ‘Big picture’ vegetation conditions
- Current vegetation biodiversity

CLAMS conceptual model
445 Plant Species on 1,500 forest plots

- **Trees:** 46 species (10%)
- **Shrubs:** 81 species (18%)
- **Herbs:** 318 species (72%)
Sitka Spruce Forest

- 331,357 ha (818,783 ac)
- 15% of forest area
Western Hemlock Forest

- 1.5 mill. ha (1.6 mill. ac)
- 65% of forest area
Pacific Silver Fir / Noble Fir Forest

- 28,594 ha (70,656 ac)
- 1% of forest area
Dry Western Hemlock / Mixed Evergreen Forest

- 308,482 ha (762,210 ac)
- 14% of forest area
Foothill Oak Woodlands

- 125,379 ha (309,812 ac)
- 6% of forest area
Forest Types and Management Objectives

• About 1/3 of each forest type managed for ecological goals EXCEPT...

• Foothill oak woodlands: 94% on private lands, few reserves, threatened by nonforest development.
Forest Age and Structure

- Associated with management history, land ownership

Old forests, closed canopies, public lands

Young forests, open canopies, private lands

![Forest Age and Structure Diagram](image)
Very Young, Open Forest

(0-25 cm, <70% cover)

- 29% of landscape
- Mostly (80%) on private lands
- 24% is managed for ecological goals
- Virtually all is managed forest, lacking legacy trees
Young to Middle-Aged Forest
(25-50 cm, >70% cover)

- Predominant condition (52% of landscape)
- Mostly (66%) on private lands
- 37% is managed for ecological goals
Mature Forests
(>50 cm, but lacking old growth characteristics)

- Small part (17%) of landscape
- Mostly (70%) on public lands
- 72% is managed for ecological goals
Old-Growth Forests *

- 2% of all forest, below historic range of variability
- Mostly (78%) on public lands, especially BLM
- 79% managed for ecological goals

* Old-Growth Habitat Index $\geq 75$. Based on stand age, tree size diversity, large tree density, snag density, down wood volume.
Natural legacies after wildfire

Legacy Trees

Lack of legacies under intensive management

Forest management w/ legacies
Large Live Trees

- Most abundant in older forest, federal lands
- Important habitat in young forests, legacy from previous forest

No. trees/ha
>100 cm dbh

- 0 - 1.7
- 1.7 - 3.4
- 3.4 - 5.2
- 5.2 - 6.9
- 6.9 - 8.6

[Map showing distribution of large live trees]

[Images of large live trees and young forests]
Snags

- Strongly affected by forest management
- Most abundant in older forests, public lands
- Diminished in young managed forest
Down Wood

- Associated with site productivity, long-term history
- More evenly distributed across ages and ownerships (greater longevity)
- Tillamook Burn legacy
Broadleaf Trees

- Coastal, riparian, foothill, disturbed habitats
- Reduced by intensive forest management favoring conifers
- Most abundant on nonindustrial private lands
Key Findings: Vegetation Biodiversity in Coastal Oregon

- In semi-natural forested landscapes, all ownerships contribute to biodiversity.

- Some biodiversity elements (tree species, forest types) are relatively insensitive to forest management practices: conservation must consider regional environmental gradients.

- Forest types represented in reserves EXCEPT foothill oak woodlands.

- Older forests: small part of current landscape and below HRV, but being addressed by current policies. Diverse young forests: also rare but receiving less attention. Legacy tree habitat: uncertain future.
What’s so novel about the CLAMS vegetation map? (i.e., advantages for ecological analysis, simulation modeling, integrated assessment)

• Spatially complete, regional in scope, AND rich in detail (tree species and structures)

• Each pixel contains a tree list, from which many continuous vegetation variables can be derived. User-defined classification systems can be applied to meet a variety of objectives.

• At regional level, full range of variability is represented. At site level, covariance of species and structures is maintained.

• Use of mapped environmental data results in models that better capture ecological relationships.