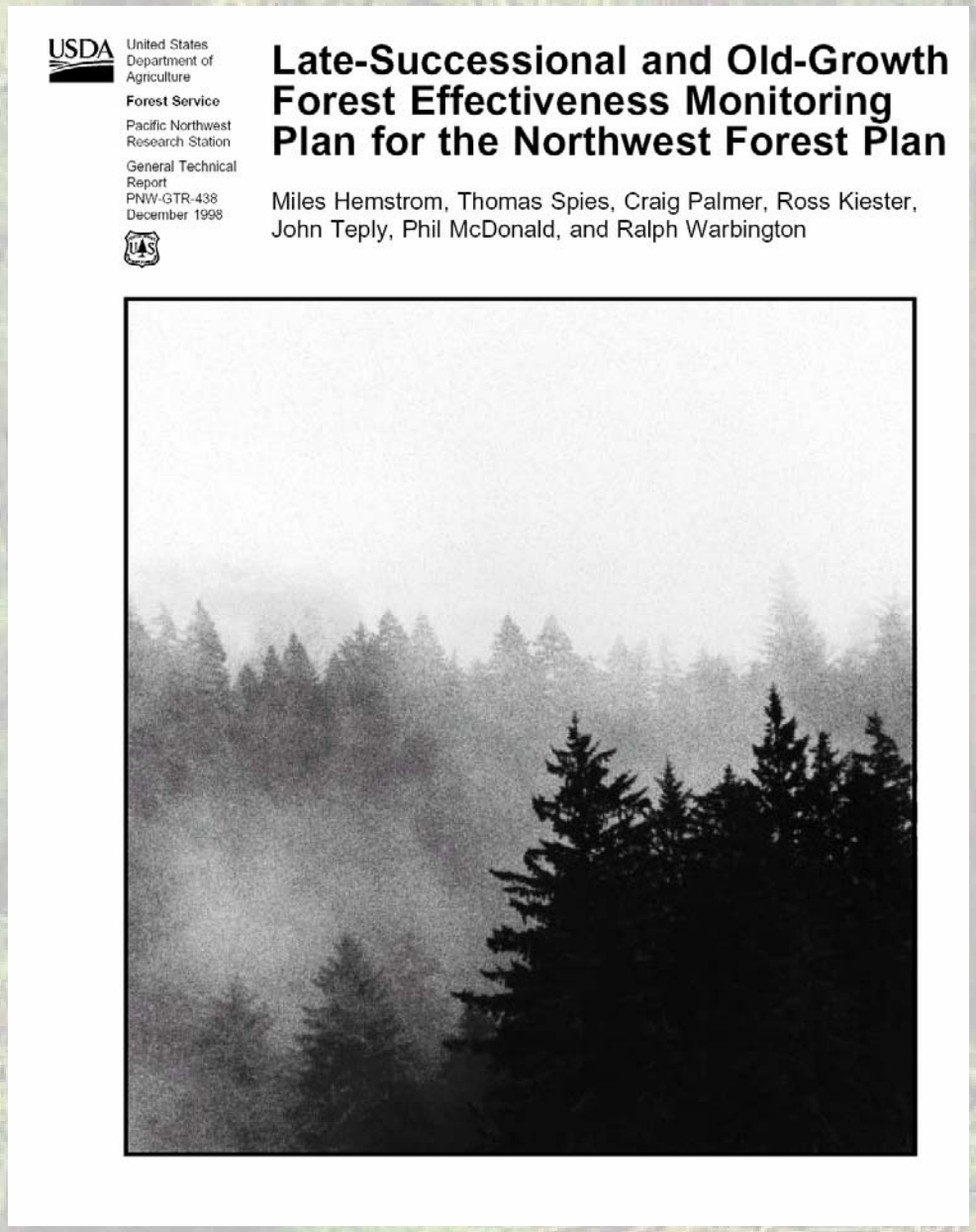


The Bumpy Road to Monitoring LSOG

under the Northwest Forest Plan

Three Key Attributes

FEMAT report (1993: 49-52) and FSEIS (USDA and USDI 1994a: 35-40)

Abundance and Ecological Diversity – the total acreage and distribution of LSOG by province

Process and Function – ecological changes or actions that lead to the development and maintenance of LSOG at all spatial and temporal scales AND the ecological values provided by LSOG.

VERY DIFFICULT TO MEASURE

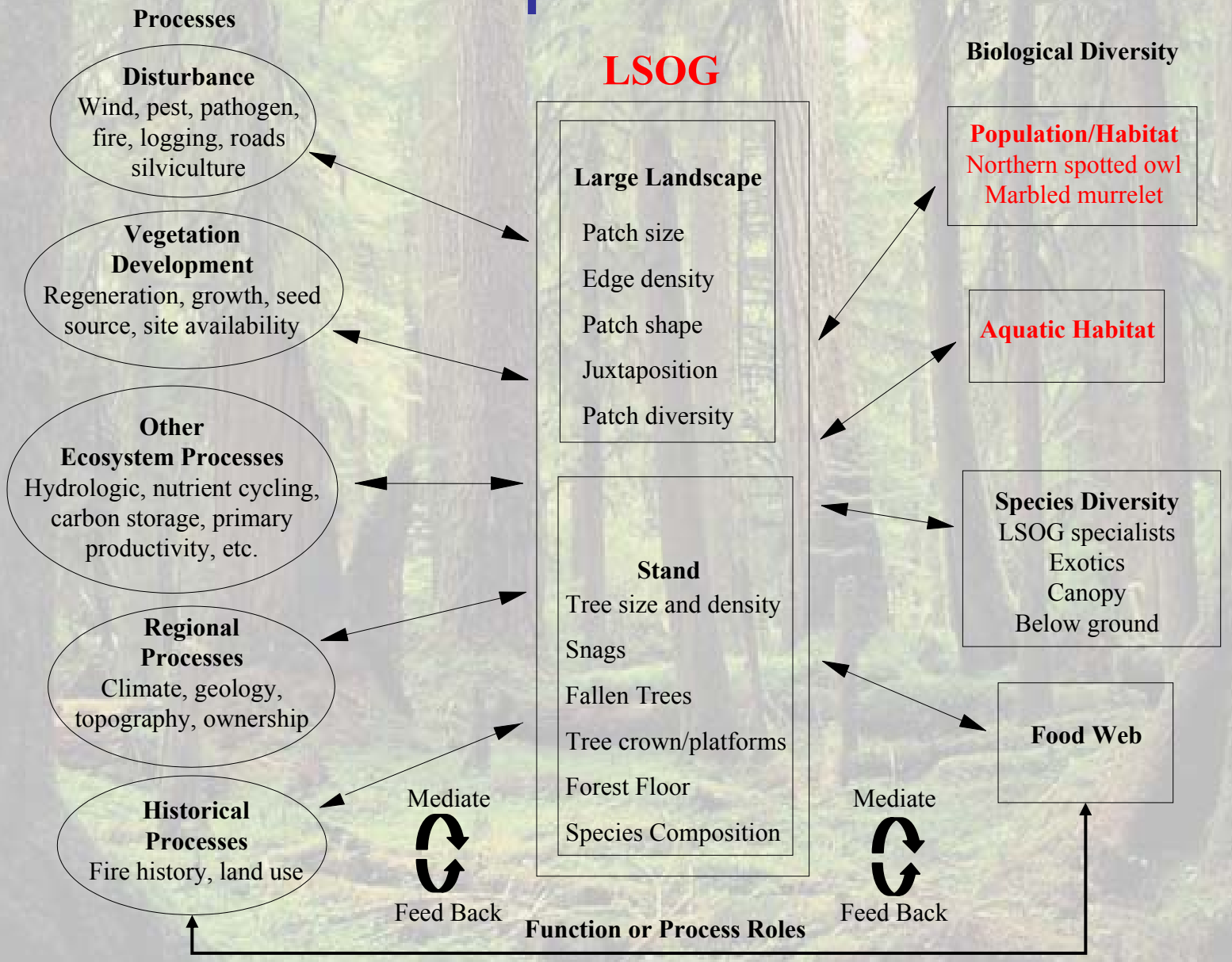
Connectivity – extent to which the large landscape pattern of the late-successional and old-growth ecosystem provides for biological and ecological flows that sustain LSOG

Two Views of LSOG

Remotely sensed, from above – upper canopy features, such as canopy cover, the size of tree crowns and inferences about tree diameter, canopy structure (single versus multiple layers), and to some extent, tree species.

Stand-scale from plot data – ground-based measurements of vegetation features (such as species, sizes, canopies, and amount of dead material).

Conceptual Model



Measurable Indicators

Selected LSOG Indicators

What can we reasonably measure?

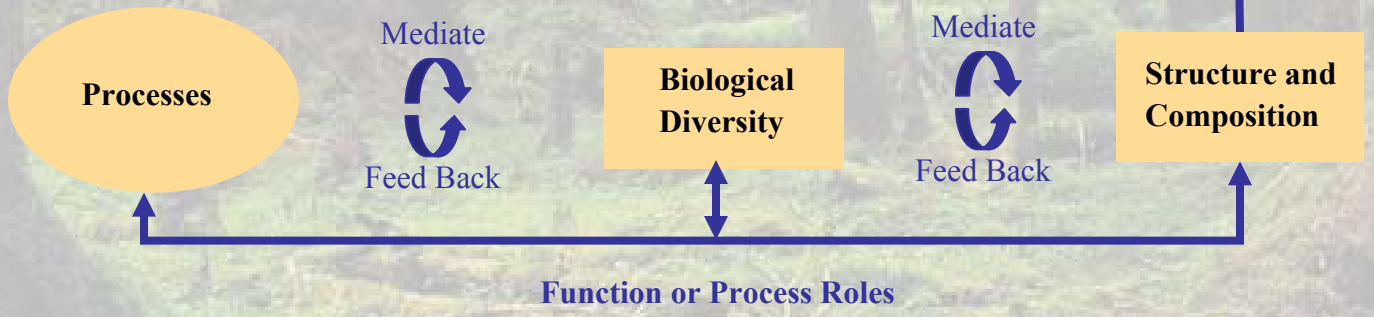
Potential LSOG Indicators

Large landscape scale
Amount and distribution of types
Patch size, shape, connection
Changes over time

Stand scale
Tree sizes by species
Canopy structure by species
Snags

Down wood

……



Questions

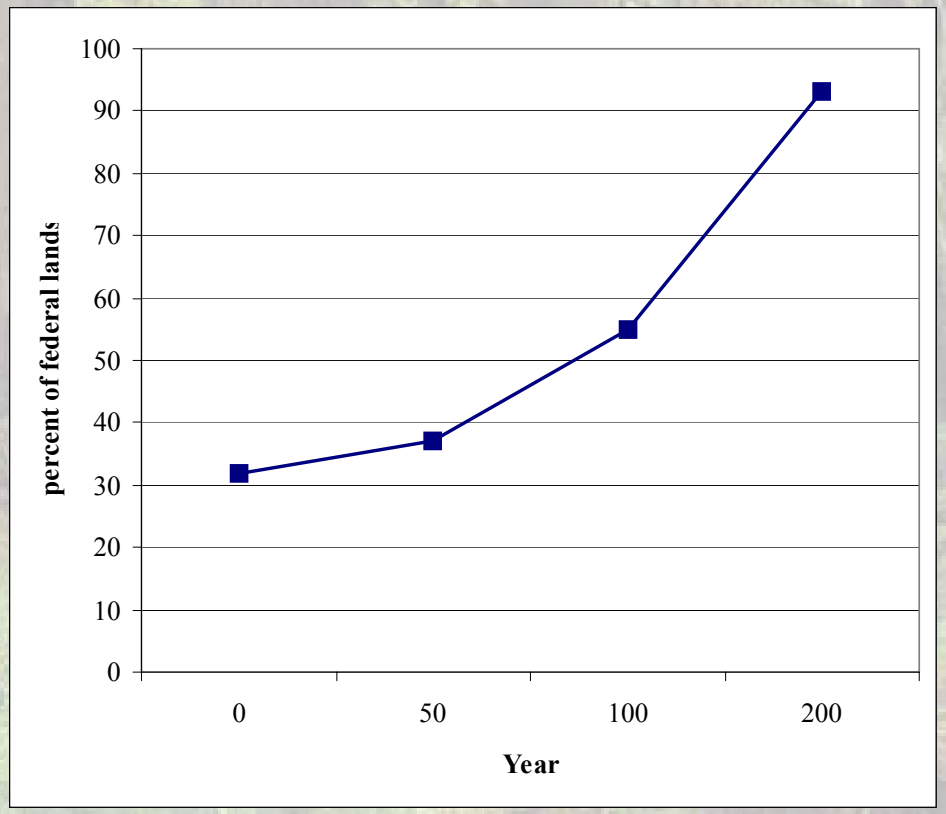
What are the distribution and amount of forest classes, including LSOG, at the large landscape scale? Maps from remote sensing. Acres from plots.

What are the stand-size distribution, stand interior area distribution, and inter-stand distance distribution of LSOG at the large landscape scale? Maps and analyses from remote sensing.

What changes are produced by stressors in distribution and amount of forest classes, starting with the year of the FEMAT analysis (1993), from stand-scale data? Analyses of changes in map and plot data.

It's Going to Take a Long Time

"The FEMAT report (1993) and the FSEIS (USDA and USDI 1994a: 43) do not project reaching these outcomes for a considerable time, because it takes decades or centuries for young stands to develop into LSOG. Changes in the first several decades should be projected for 100 years or more to evaluate likely outcomes." (Hemstrom et al. 1998; page 19)

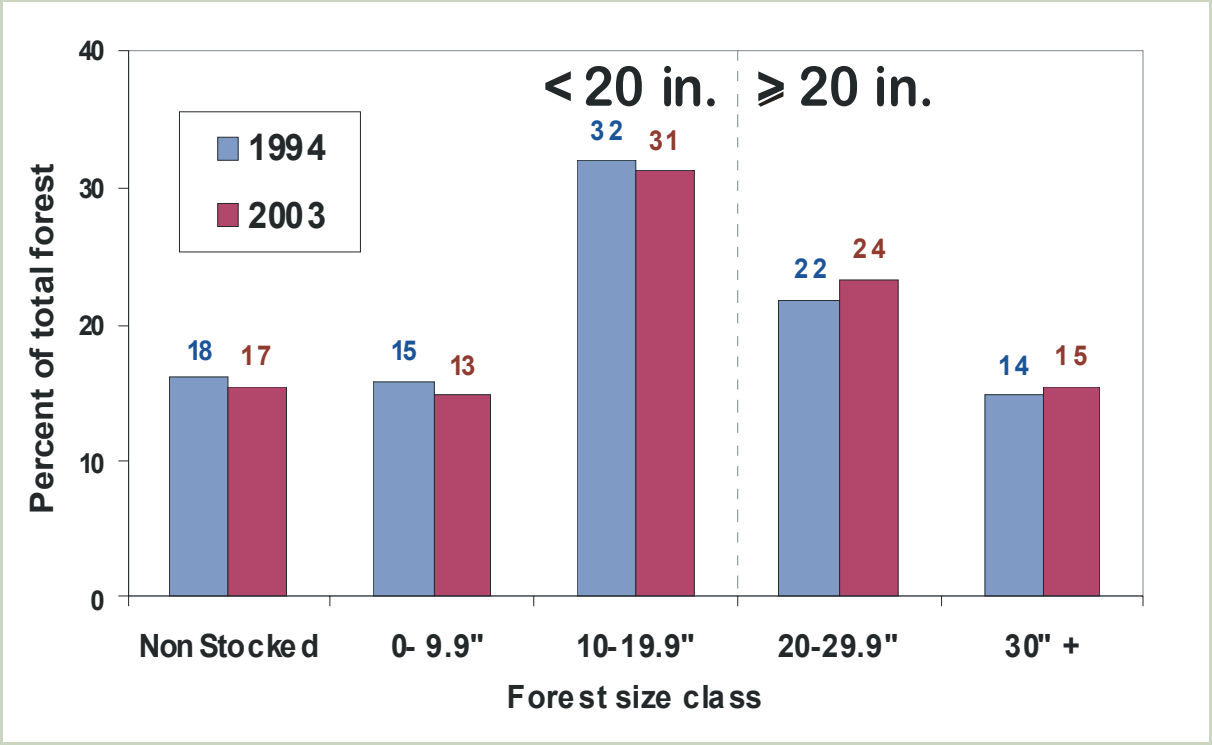



Not easy!

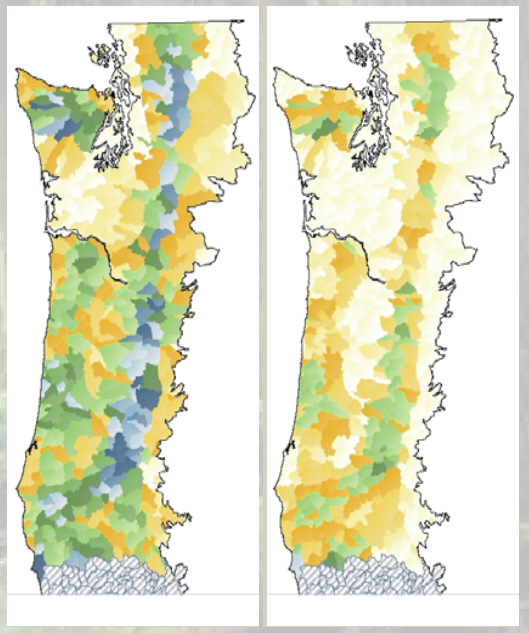

Did we answer the monitoring questions?

What are the distribution and amount of forest classes, including LSOG, at the large landscape scale?

YES…and more….



Percent of 5th Field HUC



FEMAT **Old Growth**

From: Moeur et al 2005

What are the stand-size distribution, stand interior area distribution, and inter-stand distance distribution of LSOG at the large landscape scale?

Mostly. Stand sizes – YES. Interior stand area distribution – NO. Inter-stand distances – YES.

Province	Medium and Large Distance (miles)				Size indexed to Veg. Zone Distance (miles)				Large multi-storied Distance (miles)			
	All blocks		Blocks > 1,000 ac		All blocks		Blocks > 1,000 ac		All blocks		Blocks > 1,000 ac	
	mean	(s.d.)	mean	(s.d.)	mean	s.d.	mean	(s.d.)	mean	s.d.	mean	(s.d.)
California Cascades	0.2	(0.2)	1.0	(1.5)	0.2	(0.2)	1.0	(1.3)	0.4	(0.4)	- -	- -
California Coast Range	0.3	(0.5)	16.7	(24.8)	0.3	(0.5)	12.5	(22.3)	0.3	(0.4)	33.1	(66.2)
California Klamath	0.2	(0.1)	0.5	(0.8)	0.2	(0.1)	0.5	(0.8)	0.4	(1.1)	10.8	(10.8)
Oregon Coast Range	0.2	(0.3)	2.1	(3.8)	0.2	(0.2)	2.7	(2.4)	0.2	(0.3)	3.7	(4.2)
Oregon Eastern Cascades	0.2	(0.1)	3.1	(5.1)	0.2	(0.1)	1.2	(1.9)	0.3	(0.5)	- -	- -
Oregon Klamath	0.2	(0.1)	1.3	(2.6)	0.2	(0.1)	1.3	(1.8)	0.2	(0.1)	3.6	(7.4)
Oregon Western Cascades	0.2	(0.1)	0.6	(1.8)	0.2	(0.1)	0.4	(0.7)	0.2	(0.1)	3.6	(2.8)
Oregon Willamette Valley	0.5	(1.1)	- -	- -	0.8	(1.9)	- -	- -	0.8	(1.8)	- -	- -
Washington Eastern Cascades	0.4	(0.5)	- -	- -	0.2	(0.2)	1.9	(4.2)	0.0	(0.0)	- -	- -
Washington Olympic Peninsula	0.2	(0.2)	0.4	(0.6)	0.2	(0.1)	0.4	(0.4)	0.2	(0.2)	1.4	(3.3)
Washington Western Cascades	0.2	(0.1)	0.8	(1.8)	0.2	(0.1)	0.7	(1.0)	0.2	(0.1)	3.7	(4.9)
Washington Western Lowlands	0.3	(2.1)	2.0	(3.7)	0.4	(0.5)	- -	- -	0.8	(0.7)	- -	- -
Northwest Forest Plan	0.2	(0.2)	1.0	(3.9)	0.2	(0.2)	0.9	(3.7)	0.2	(0.2)	4.9	(17.2)

What changes are produced by stressors in distribution and amount of forest classes, starting with the year of the FEMAT analysis (1993), from stand-scale data?

YES. Fire and timber harvest stressors examined. LSOG increased at about 600,000 acres for the first decade overall. Varies by province. Generally in line with NWFP expectations.

Net change estimated over 10 years in ≥ 20-inch class

Province	Percent	Acres
California		
Cascades	12.7	49,500
Coast Range	5.1	9,300
Klamath	9.7	193,700
Total		**252,500**
Oregon		
Coast Range	5.6	32,200
Eastern Cascades	1.9	4,700
Klamath	9.7	76,100
Western Cascades	3.6	74,900
Willamette Valley	na	na
Total		**187,900**
Washington		
Eastern Cascades	2.7	4,900
Olympic Peninsula	-4.6	-30,600
Western Cascades	12.9	191,000
Western Lowlands	na	na
Total		**165,300**
Northwest Forest Plan	7.7	**605,700**


Excellent Job!

Key Issues

- Different kinds of old forest in different environments
- Different old forest dependent species
- Reactions to disturbance and management?
- Propensity to produce old forests?
- Effects of climate change?

Conceptual Model

- How do growth, succession, disturbance, management, climate change interact to produce old forests?
- How does this vary by province?
- How can we reinforce landscape
  - Propensity to produce old forest?
  - Given disturbances?
- Integrative, understandable, shared

Solution?

- Simple conceptual models
- Integrate on-going research
- Work for planning and monitoring

Vegetation Type A

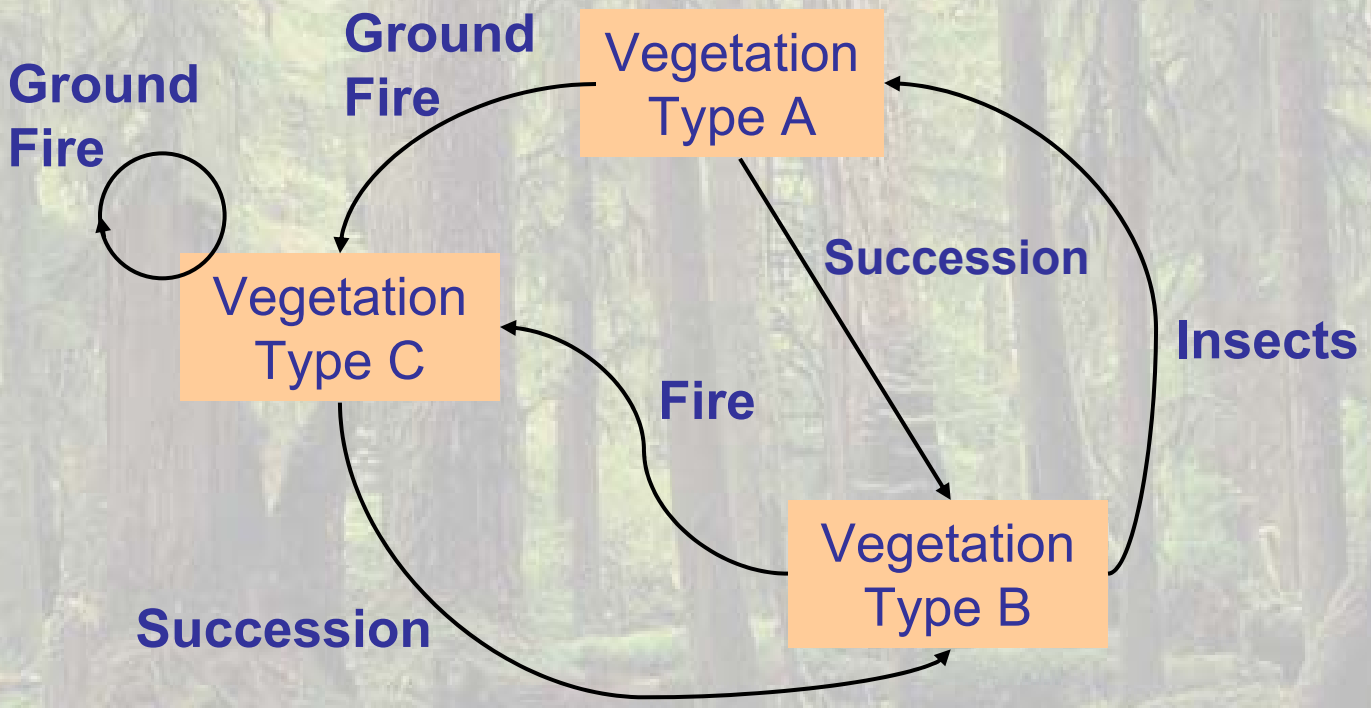
Cover type: Ponderosa Pine
Structure: Old single-story forest

Regeneration
Growth
Underburning

Vegetation Type B

Cover type: Ponderosa Pine
Structure: Non-Stocked, Post disturbance

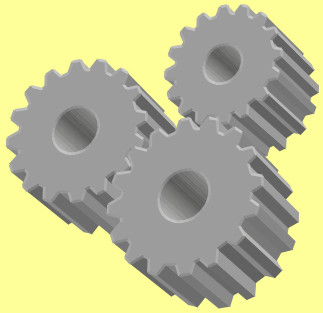
State and Transition Models



Vegetation Development Dynamics Tool (VDDT). www.essa.com

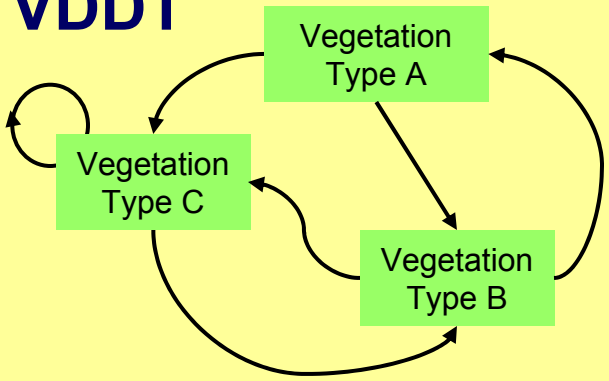
Tool for Exploratory Landscape Scenario Analysis (TELSA)
www.essa.com

Database

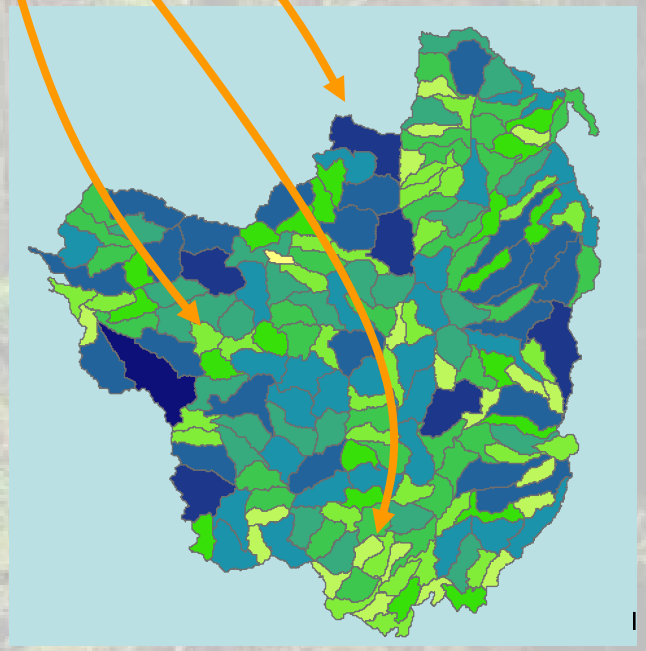


- Vegetation cover type, structure
- Disturbances
- Associated characteristics (e.g. wildlife habitat, products, etc.)

VDDT

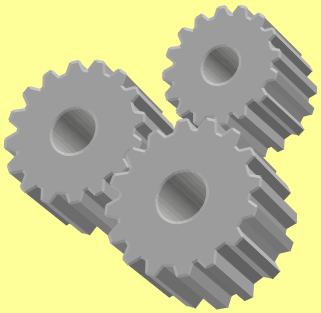


Summarize VDDT results to HUC6, ownership, potential vegetation group

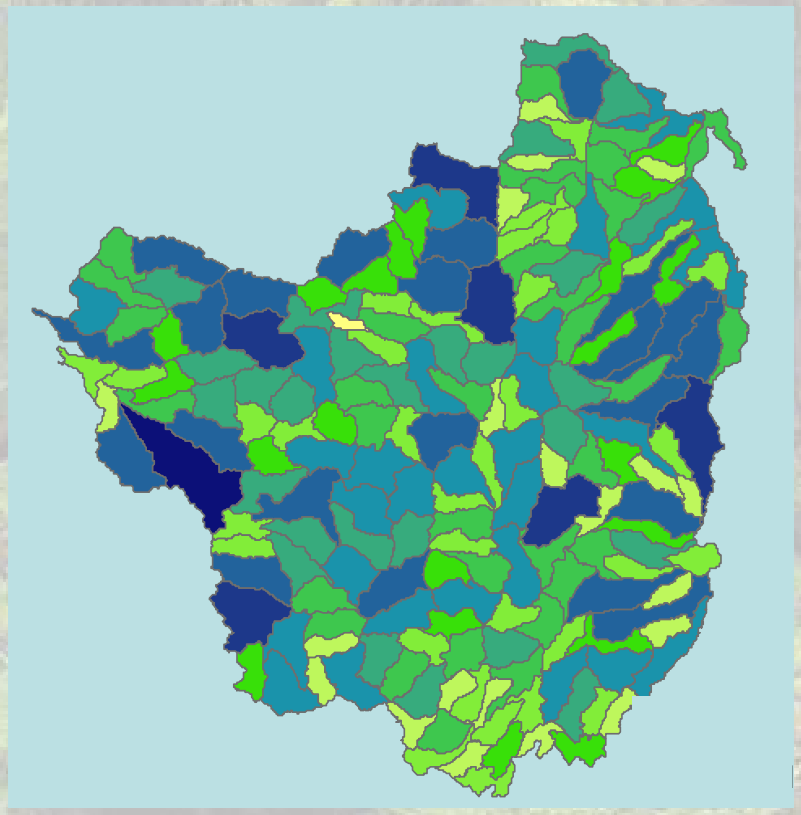


Example Old Forest Habitat

VDDT



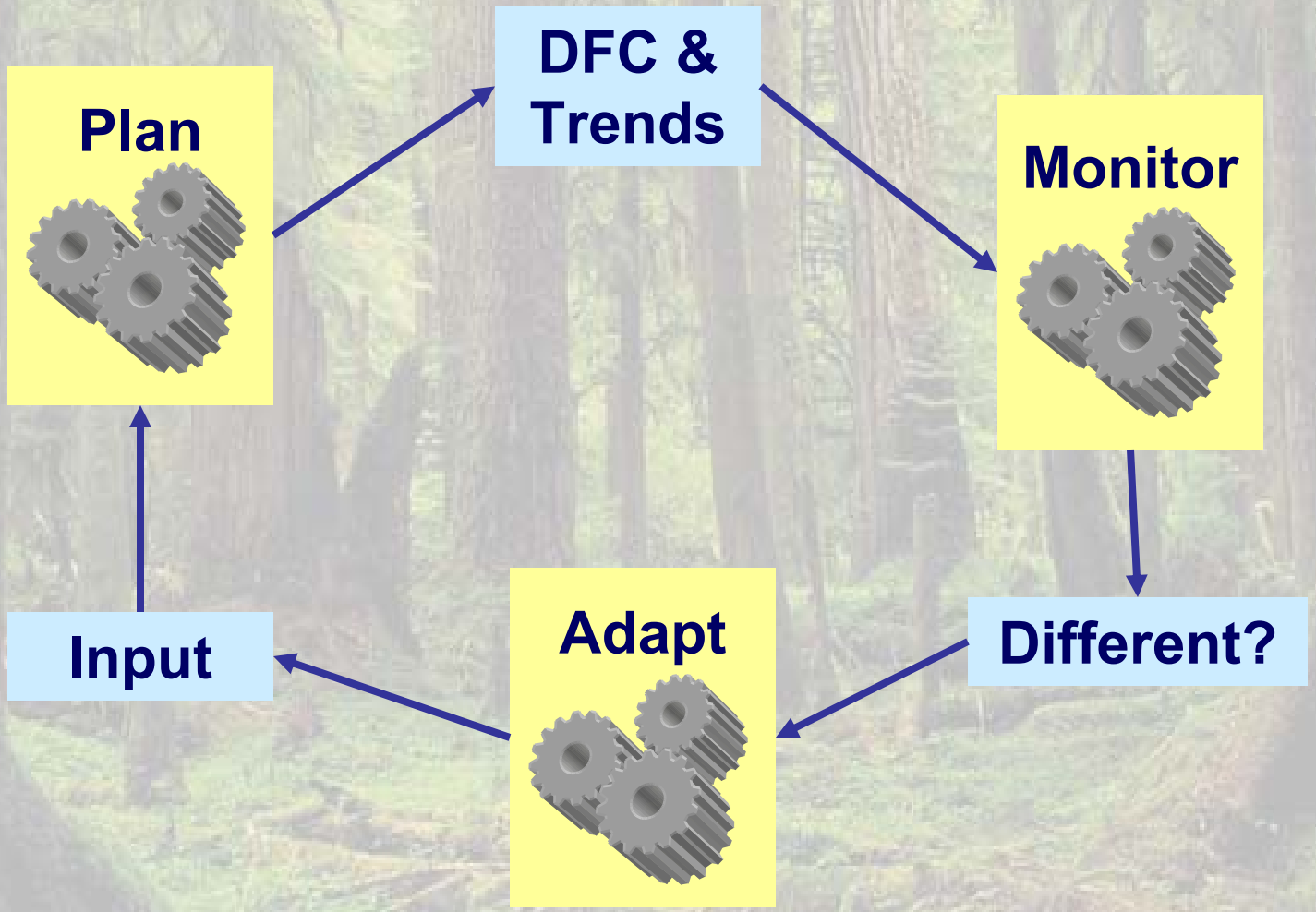
- Vegetation cover type, structure
- Disturbances
- Associated characteristics (e.g. wildlife habitat, products, etc.)



HUC6	Acres of highly suitable habitat
1	10,000
2	2,000
3	500
…	xxxxx

Habitat models

Trends and Desired Future Condition



BUT……

- Existing vegetation mapping was more difficult, time-consuming, and expensive than estimated.
- Coordination and data standardization across the NWFP area was difficult.
- Budgets are shrinking
- Expertise is spread thinner
- **The next monitoring report will have to be done quicker, cheaper, and still answer difficult questions.**

Solution? Partnership

- **A partnership between State, Federal agencies, Research, and others**
- **Leverage scarce resources**
- **Develop common vegetation data and models**
- **Mesh with NF plan revisions**
- **Assist in BLM plan revisions and sage grouse habitat analyses**
- **Accomplish Oregon Department of Forestry assessment objectives**

Challenges

- Limited and declining funds
- Very busy people
- No desire for conflicting answers to broad questions
- Need integrated answers – single resource perspectives not suitable
- “Black box” models
- Direct tie between planning, adaptation, and monitoring

Cooperation and Partners

- A consistent approach for assessment, analysis, planning, and monitoring.
- Leverage available resources with partners who need the same kinds of information.
- Regional or mid-scale approach that integrates finer scales and relates to coarser scales.