

## Application of Ecological, Social and Economic Values to Land Management Planning and Implementation

Nikola Smith U.S. Forest Service Pacific Northwest Region

A Community on Ecosystem Services (ACES) Conference December 9, 2014







Our Story





### **Ecosystem Management**

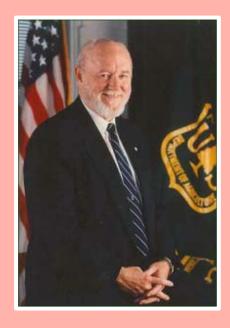


"New Forestry, New Perspectives"
Chief Dale Robertson (1987)

## "Natural Resource Agenda"

emphasis areas under Chief Mike Dombeck (1997)

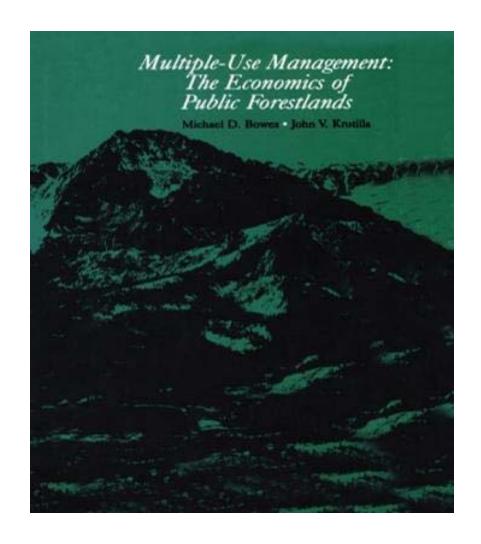
- 1) watershed health and restoration,
- 2) sustainable forest management,
- 3) national forest roads, and
- 4) recreation



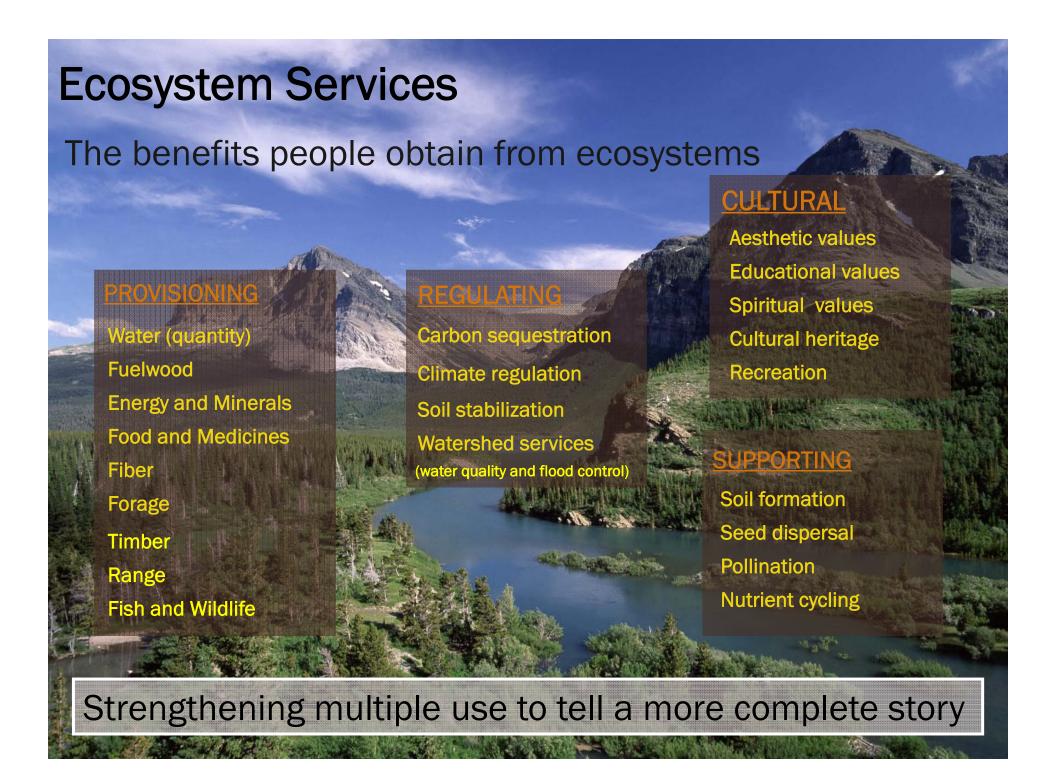
"We need to be prepared to move into the 21st century or we'll be left in the dust."

Assessing the economic benefits of multiple use.

Bowes and Krutilla, 1989







# Ecosystem Services as a Framework for Forest Stewardship



United States Department of Apriculture

Pacific Northwest

General Technical Report PNW-GTR-652

us

Ecosystem Services as a Framework for Forest Stewardship: Deschutes National Forest Overview

Nikola Smith, Robert Deal, Jeff Kline, Dale Blahna, Trista Patterson, Thomas A. Spies, and Karen Bennett





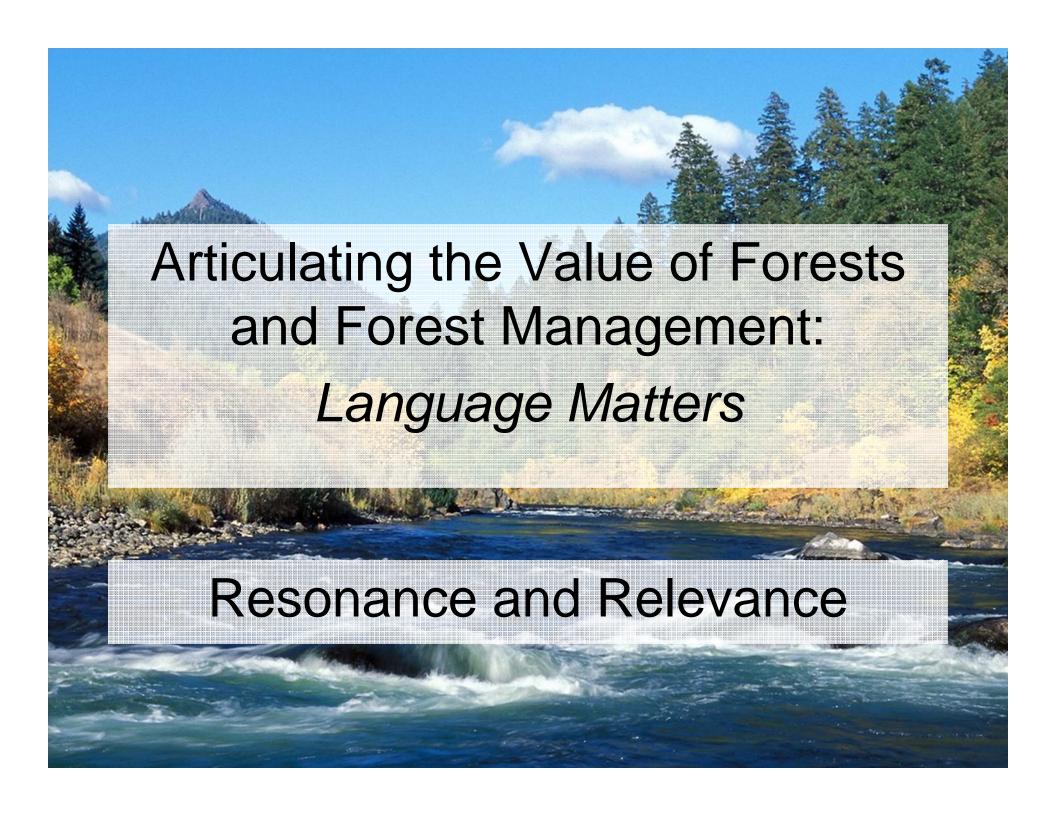












## Using ecosystem services to frame forest management is like going from

black and white

to color





~ John Allen, Forest Supervisor, Deschutes National Forest



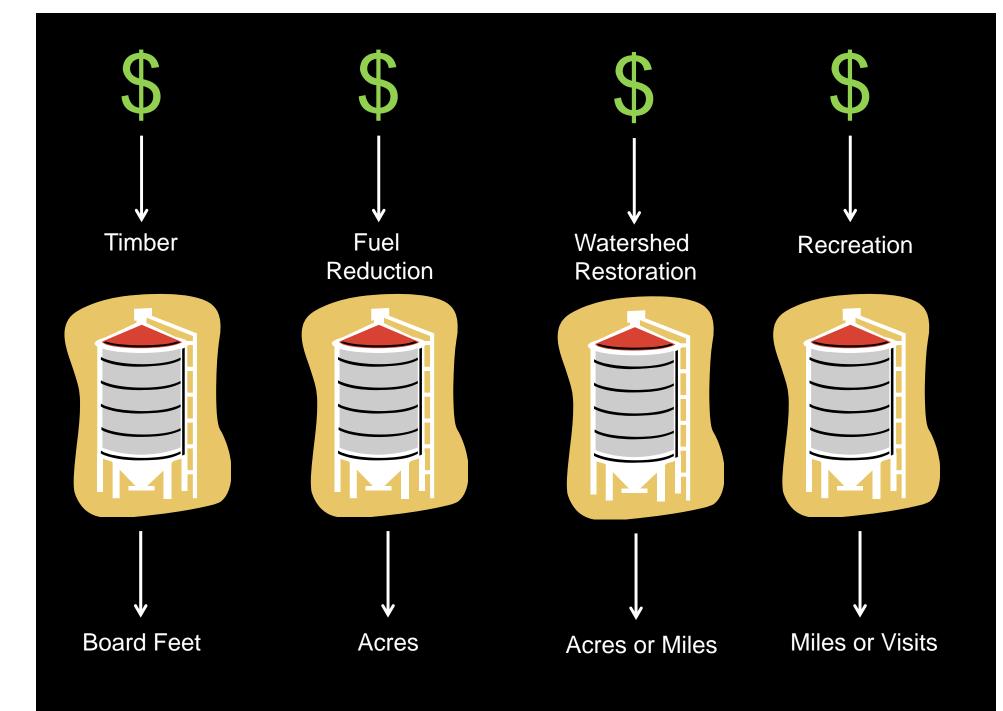
Thinking about landscapes as integrated systems.

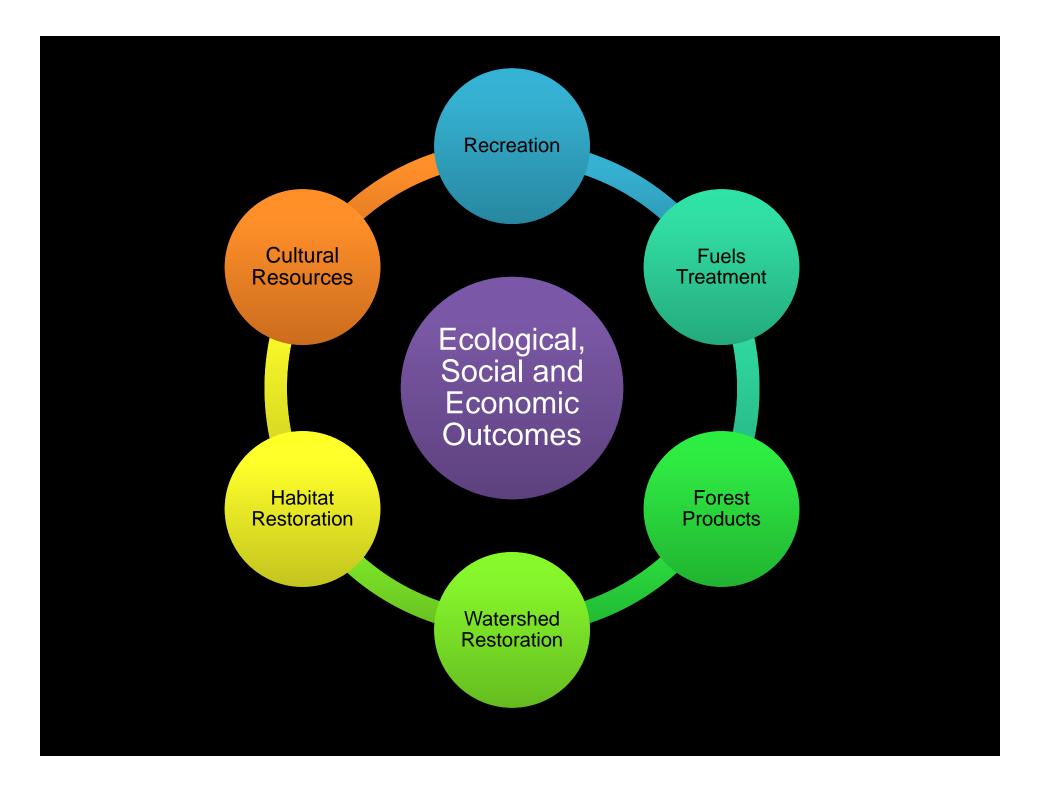
Connections between ecological structures, processes, functions and public benefits.

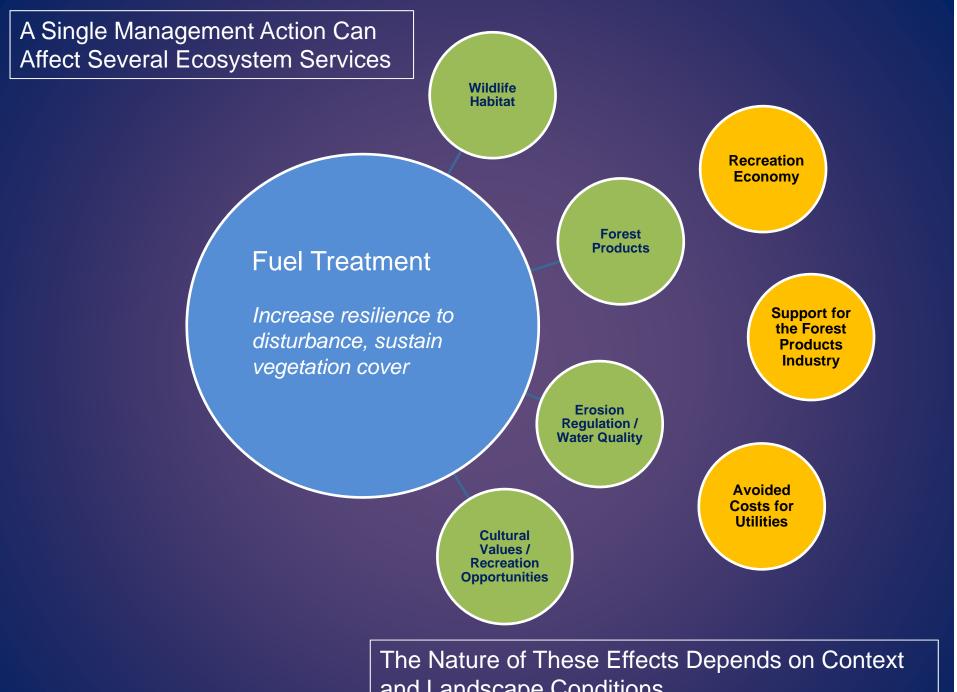
Interdisciplinary drivers for decisions.

Collaborations with adjacent landowners and land managers.

Thinking about our **agency** as a cohesive organization.



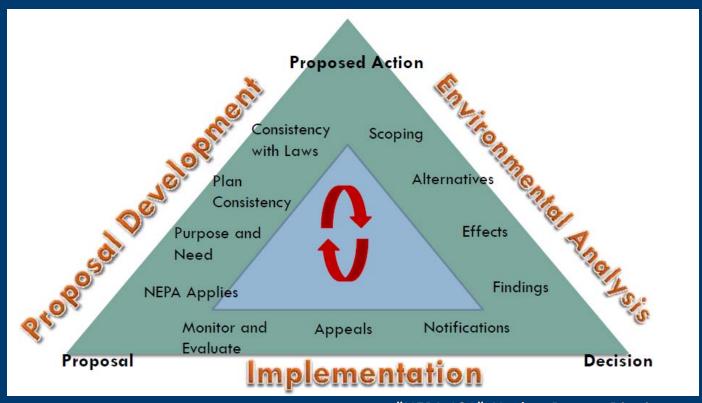




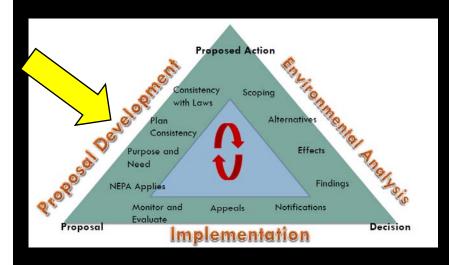
and Landscape Conditions

## How Do We Make This Real? National Environmental Policy Act (NEPA)

- ✓ Promote harmony between people and the environment
- ✓ Ensure that **environmental factors and effects** as well as project alternatives are considered in decisions



## Participatory Process

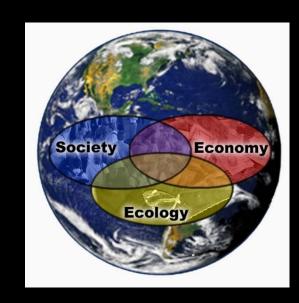


"We feel the role of forest management can only be successful through active participation by all those with a vested interest in protecting the ecological resilience and sustainability of our forested lands."

- Forest Service Chief Tom Tidwell

#### A New Approach Results In:

- new drivers for decision-making
- •integration of efforts across disciplines
- •local community support

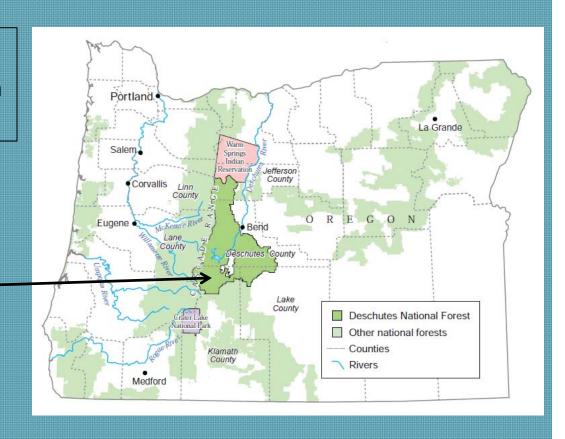


## From Theory to Practice: The Marsh Project Crescent Ranger District, Deschutes National Forest

- 12,000 hectare watershed
- One of the largest high-elevation
   Marsh complexes in the US



Photo Credit: Carina Rosterolla, Crescent RD



## Internal and External Workshops: Collaborative Identification of Priority Ecosystem Services

Identify Values & Benefits

Describe Attributes & Components Define Current Condition Potential Management Actions Pos/Neg Effects and Trade-offs



### integrated systems approach

**Cultural Resources** 

**Dispersed Camping** 

**Educational Opportunities** 

Existence Value of Botanical Resources

and Wildlife Species

**Firewood** 

Fishing and Hunting

Recreation

Remoteness

Matsutake Mushrooms

Recreational vehicle use

Post and Poles

Scenery, Pristine Viewshed

Solitude, Wildness

**Timber Volume** 

Water Quality, Quantity and

Storage

Wildlife Viewing

Ecosystem Services Management Effects Matrix		Ecosystem Services								
		Cultural		Provisioning		Supporting		Regulating		
		Solitude, Spiritual, Self- Discovery	Access	Matsutake Harvest	Clean, Cold Water	Flora & fauna biodiversity	Soil Health	Water Storage & Filtration	Natural disturbance processes (fire & floods)	
					9					
Management Action	Road maintenance	И	7	$\rightarrow$	7	Я	$\rightarrow$	7	$\rightarrow$	
	Lodgepole encroachment thinning	7	7	И	7	<b>↑</b>	71	7	<b>\</b>	
	Removal of Reed Canary Grass	7	$\rightarrow$	$\rightarrow$	7	<b>↑</b>	7	<b>↑</b>	7	
	Hardwood Restoration	7	$\rightarrow$	И	<b>↑</b>	<b>↑</b>	<b>↑</b>	<b>↑</b>	<b></b>	

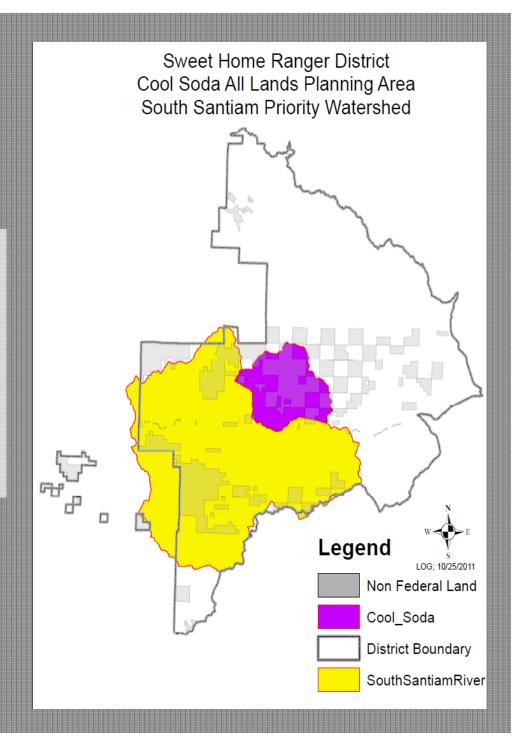
Strongly	$\Lambda$		
Positive			
Slightly	7		
Positive	/1		
Neutral	$\rightarrow$		
Slightly	\ <u></u>		
Negative	7		
Strongly			
Negative	$  \Psi  $		



## Willamette National Forest Sweet Home Ranger District

South Santiam River Watershed – 40,000+ forested acres in the west flank of the old Cascade Range.

Checkerboarded with Hill Timber and other private landowners.



What is this landscape about? natural foundational processes

Geology and Landforms

Hydrology and Fisheries

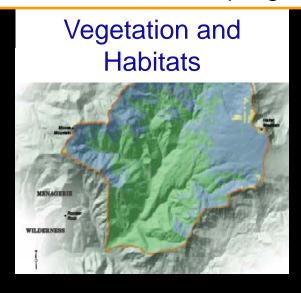
How do functions and processes extend beyond our boundary?

What and where are challenges and stressors on the system?

What is our management vision?

Where can we be most effective?

How can we work across programs and with partners to achieve our goals?





Benefits.

#### Riparian

•Aquatic, floodplain **Upland Forest** 

·Old growth, midseral, early seral

#### Shrub

Vine maple patches

#### Meadows

•Wet and dry

Ponds and seeps Rock talus

#### Visual quality Scenery

First foods (huckleberries) Recreation potential

- Dispersed camping
- Swimming holes
- · Hiking, fishing, hunting

#### Existence value

**Spiritual** (Native values and

general recreation) Solitude, Space

**Cultural** heritage

Rich settlement history Public access

**Special or unique species** 

#### Clean cold water

· drinking water

#### Food

- fish, plants, elk, deer, upland birds
- First foods (huckleberries)

#### **Forest products**

- Wood products
- Special forest products

#### Mineral sources

- Stream gravel
- Road rock

Jobs and economic activity

Human Actions (Potential to affect above or below): Flood Control Dam, Forest Management, Road Construction and Maintenance, Fire Suppression, Recreation

#### **Underlying Processes and Functions (Foundation)**

Nutrient cycling, Nutrient fixation (red alder), Soil formation, Natural Disturbance (Fire, wind, landslides, insects and disease), Water cycling (Collection, storage, release, filtration, cooling) Carbon cycling, Photosynthesis (Oxygen production), Elevational diversity, Air purification

Need	Proposed Action	Outputs	Outcomes	В	enefits from Nature
Minimize sources of fine sediment	Road sidecast pullback	1 mile of stream restored	90% of the high aquatic risk side cast areas will be stabilized. May prevent approximately 100 cubic yards of fine sediment from entering Soda Fork.	•	Clean water Aquatic habitat Jobs
Increase conifers in riparian areas	Convert alders to conifers	2 acres	50% of the historic cedar density would be restored in the alder-dominated floodplains on listed fish habitat	•	Clean cold water Wild fish
Treat densely- stocked stands	Commercial thinning to create wildlife corridors	830 Acres 5 MMBF	22% of identified wildlife corridor treated to improve movement across the landscape. Pulls elk away from CTC plantations to minimize damage to planted trees.	•	Wildlife sp. diversity and habitat Timber products Hunting
Local economic development	Timber products from both public and private lands	2.5 MMBF	20% of available mature forest on high productivity soils to be harvested and replanted for sustainable timber production.	•	Jobs Timber products Wildlife sp. diversity and habitat
Limited recreation opportunities	Community-built ridgeline trail	5 miles of shaded fuel break/trail	Increases recreation activities by 90% and diversifies activities by 30%.	•	Recreation Aesthetics and spiritual values Environmental education Public health Traditional cultural uses Jobs

### Cool Soda All Lands Restoration Proposal



Cascade Timber Consulting, Inc.



October 2012

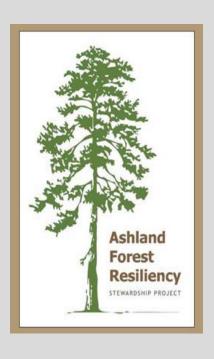








### People and Ecosystems of the Rogue Basin Assessing Risks and Sustaining Values







- How do people benefit from the land?
- How do ecological processes and structures support those benefits?
- What threatens the ability of the land to provide those benefits over time?
- What management actions are needed across jurisdictions?

APPLEGATE PARTNERSHIP &
WATERSHED COUNCIL







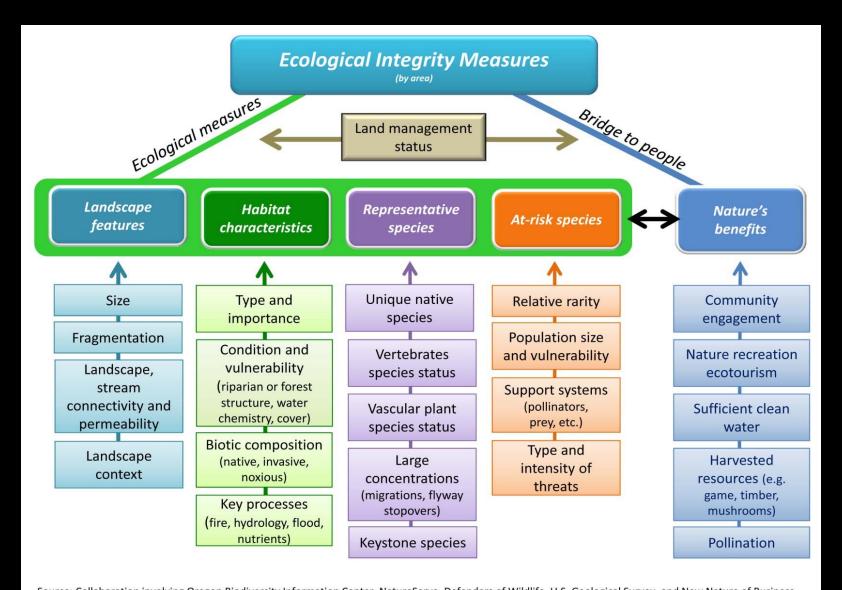


## People and Ecosystems of the Rogue Basin Workshop Medford, OR ~ July 30-31, 2014

### Increase understanding of:

- the ecology of the basin (conditions, trends and stressors)
  as well as the implications of a changing climate
- connections between the basin's ecological context and its capacity to provide ecosystem services
- social and economic factors affecting natural resource management
- integrated applications of ecological, social and economic information to project-level decision-making

### Institute for Natural Resources Ecological Integrity Assessment



Source: Collaboration involving Oregon Biodiversity Information Center, NatureServe, Defenders of Wildlife, U.S. Geological Survey, and New Nature of Business.

## Information and Presentations Available Online



http://www.pdx.edu/sustainability/ecosystem-services-and-the-rogue-basin-workshop



## Applying ecological, social and economic information to on-the-ground projects

Gold Beach Ranger District Shasta-Agness Planning Area

Siskiyou Mountains Ranger District *Applegate Adaptive Management Area* 



### Federal Forests in Curry County, Oregon

Rural Oregon counties scramble as timber payments dry up, while critics say it's time they paid for services



Timber Payments Provided: 65% of operating budget 61% of road budget

## Curry County voters once again reject property tax increase; state may now intervene

Property tax is second lowest in the State \$0.60 per \$1,000 assessed value

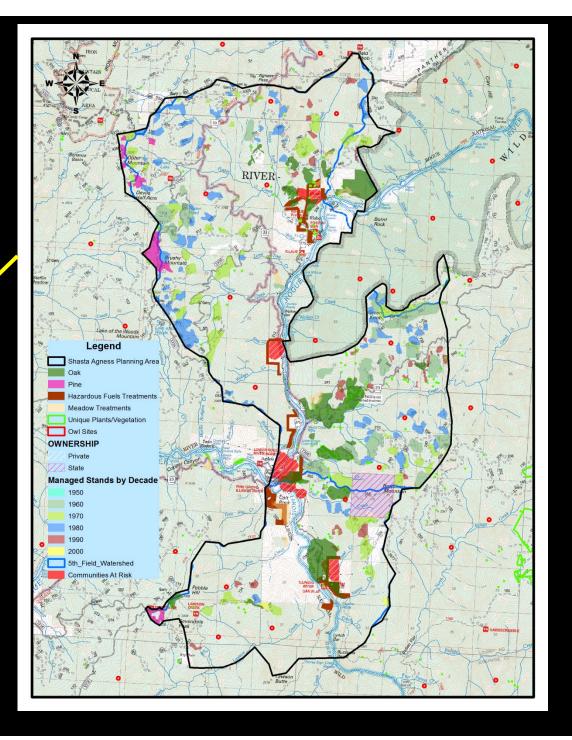


## Wild Rivers Coast Forest Collaborative









### Ecosystem Services to be addressed in the Shasta-Agness Planning Area

### Biodiversity (plant and animal)

Fire suppression has shifted vegetation's natural range of variability

Impacting sensitive plant and spotted owl habitat, oak savannas, listed fish species, soil biota, mycorrhizal interactions and other forms of biodiversity



Three rivers in the planning area are above regulated thresholds for temperature and dissolved oxygen



## Non-Timber Forest Products and Cultural Resources

Hazelnut, acorns and medicinal species
Tribes interested in harvest and mapping for sustainable use



## Cultural Values / Aesthetics and Recreation

Application of indigenous management practices within oak savanna

Increase in recreation opportunities and infrastructure (with benefits for local economies)



### **Pollinator Habitat**

Fire exclusion and colonization of invasive plants has led to a reduction in the amount of herbaceous dominated vegetation across the landscape



### Timber

Forest products as outcomes of ecologically-driven vegetation treatments





Forest Service Washington Office

1400 Independence Avenue, SW Washington, DC 20250

File Code:

22.00

Date: December 16, 2013

Route To:



**Subject:** Pollinators and Restoration

To: Regional Foresters, Station Directors, Area Director, IITF Director, Deputy Chiefs

and WO Directors

#### "Pollinators and the ecosystem services they provide are critical to life as we know it."

- √ "In temperate ecosystems 78.5 % of flowering plants require an animal pollinator to successfully reproduce.
- ✓ Three-quarters of our global food crops depend on pollination services from wild and domestic pollinators. "

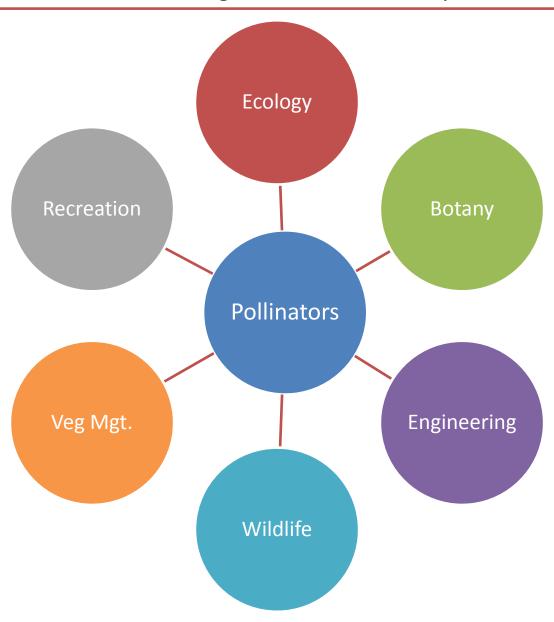
"Our Nation's wildlands are increasingly being recognized as vital reservoirs for pollinators and the key services they provide for our Nation's food security as well as for the health and resilience of our native ecosystems."

# Integrated Approaches to Management: Relationships Between Pollinators and Other Ecosystem Service Objectives



#### Integrated Approaches to Management:

Relationships Between Diverse Program Areas and Ecosystem Services Objectives





## Northwest Forest Plan of 1994

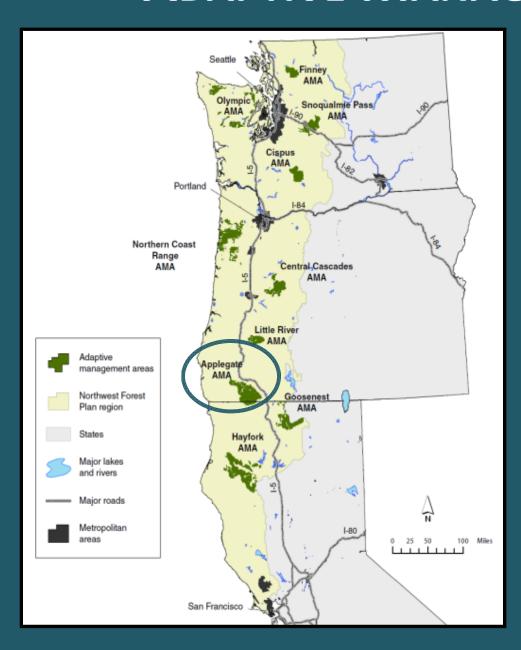
Response to controversy over harvest of old-growth forests

New approach to land management on 9.7 million ha of federal forest lands within the range of the northern spotted owl

New land use allocations and specific guidelines with an emphasis on adaptive management



## **ADAPTIVE MANAGEMENT AREAS**

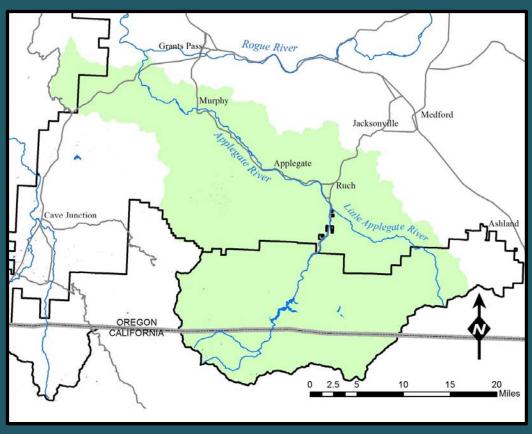


Network of 10 areas specifically designed for testing alternative approaches to more effectively achieve desired ecological, social and economic objectives

# Applegate Adaptive Management Area Opportunity for Coordinated Cross-Jurisdictional Management

Learning that includes social and political knowledge, not just biological and physical information

Develop localized methods that will best reflect the needs of the land and communities



68% publicly owned (FS and BLM)
✓ 32% privately owned



- Understand the relationships between sustainable resources and sustainable economies.
- Apply ecological principles.
- ✓ Enhance the relationship of agencies to the communities within and adjacent to the AMA.
- ✓ Contribute to the economic well-being of communities.

United States Department of Agriculture

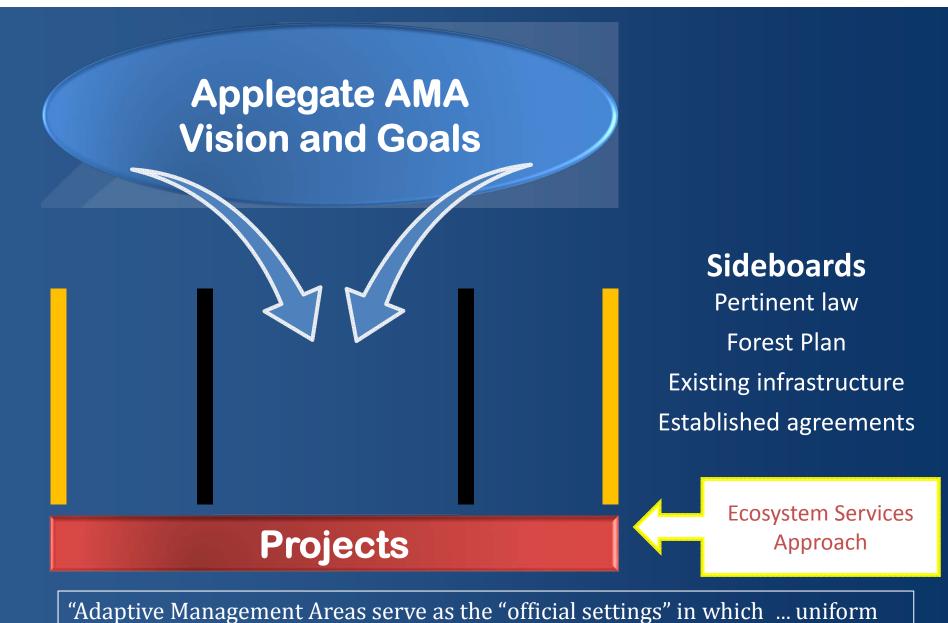
Forest Service Pacific Northwest Research Station

Research Pape PNW-RP-567 Learning to Manage a Complex Ecosystem: Adaptive Management

and the Northwes

 Barriers to adaptive management implementation are primarily institutional in nature, including statutory and political constraints and risk-averse organizational cultures.

 Leadership must occur throughout an organization; e.g., advocates at field levels are as essential as progressive agency heads.



"Adaptive Management Areas serve as the "official settings" in which ... uniform standards and guides can be tested, validated, and/or modified ..."

Stankey and Clark, Adaptive Management Areas: Achieving the Promise, Avoiding the Peril, 1998

### Advancing Meaningful Restoration

Vision - Scale - Collaboration

"There is a need to move away from constraining our vision based on the current situation by saying 'restoration will never happen because'. Instead.....it could rather be asked, 'how can we make large scale restoration happen?'

If we are not addressing environmental problems on an appropriate scale, or if actions are not part of a generally agreed pathway toward addressing those problems, what are we doing?"

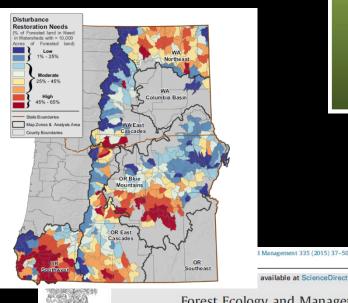
Stretch Goals and Backcasting: Approaches for Overcoming Barriers to Large-Scale Ecological Restoration, Manning et. al., December 2006, Restoration Ecology, Vol. 14, No. 4, pp. 487–492



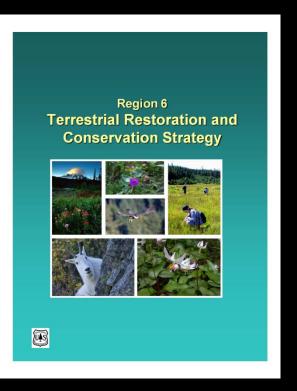
## RESULTS AVERAGED PER CATCHMENT (HUC 7) APPLEGATE: VALUES MAPPING EXERCISE AND SCALED BY FEDERAL OWNERSHIP MAP LEGEND RELATIVE RANKING OF VALUES Scaled by Federal Ownership) **Driving Values** Oak woodlands <sup>The</sup>Nature Pine-dominated systems At-risk endangered species habitat Old-growth (present and "next generation") Fire-prone forests Public Lands Adjacent to Private - 113,000 Acre Timber infrastructure Communities at risk due to fire

#### **Application of USFS and External Products to Understand Landscapes** and Ecosystem Services

- ✓ integrated systems
  - √ targeted actions
- ✓ meaningful outcomes



The Rogue Basin Action Plan for Resilient Watersheds and Forests in a Changing Climate Southern Oregon Forest Restoration Collaborative



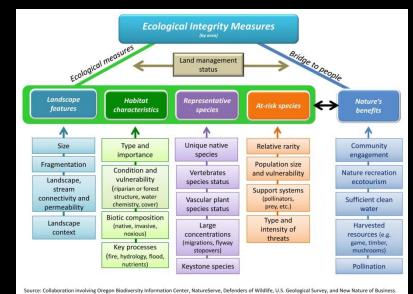


Forest Ecology and Management

journal homepage: www.elsevier.com/locate/foreco

A new approach to evaluate forest structure restoration needs across Oregon and Washington, USA

Ryan Haugo a,\*, Chris Zanger b, Tom DeMeo C, Chris Ringo d, Ayn Shlisky E, Kori Blankenship b, Mike Simpson f, Kim Mellen-McLean c, Jane Kertis g, Mark Stern h



#### Social and Economic Values

Community and stakeholder engagement

Connections between ecological conditions and ecosystem services

Valuation in ecological, economic, quantitative and qualitative terms

 Water, recreation, forest products, pollination, air quality, cultural resources and more





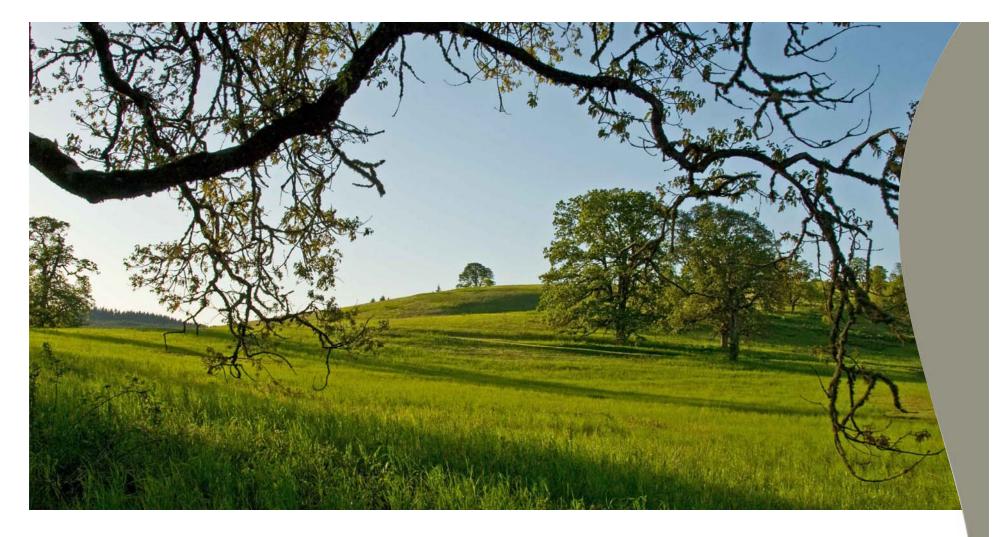




### APPLEGATE AMA PLANNING GOAL

revisited November 2014

An integrated management strategy that: provides prioritized recommendations to address short-term and long-term restoration needs on all ownerships, recognizes ecosystem services and implements collaboratively developed projects.



## Thank You!

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