

A photograph of a pine forest with a semi-transparent text box overlaid in the center. The forest floor is covered in dry pine needles and scattered rocks. The trees are tall and thin, with reddish-brown bark. The text is in a bold, black, sans-serif font.

**Fremont-Winema National Forest
Accelerated Landscape Restoration
and IDT Approaches**

Presentation Outline

1. Need for Accelerated Restoration
2. Fremont-Winema National Forest Accelerated Landscape Restoration (ALR) and Ten Year Plan
3. Lobert Restoration Project
 - Planning at the Landscape Scale – Successes/Challenges
 - Proposed Action Development

A photograph of a pine forest with a semi-transparent text box overlaid in the center. The forest floor is covered in pine needles and has several large, dark rocks scattered across it. The trees are tall and thin, with a dense canopy of green needles. The text is in a bold, black, sans-serif font.

**WHY DO WE NEED TO ACCELERATE
LANDSCAPE RESTORATION?**

Restoration? We Really Mean “Integrated Restoration”

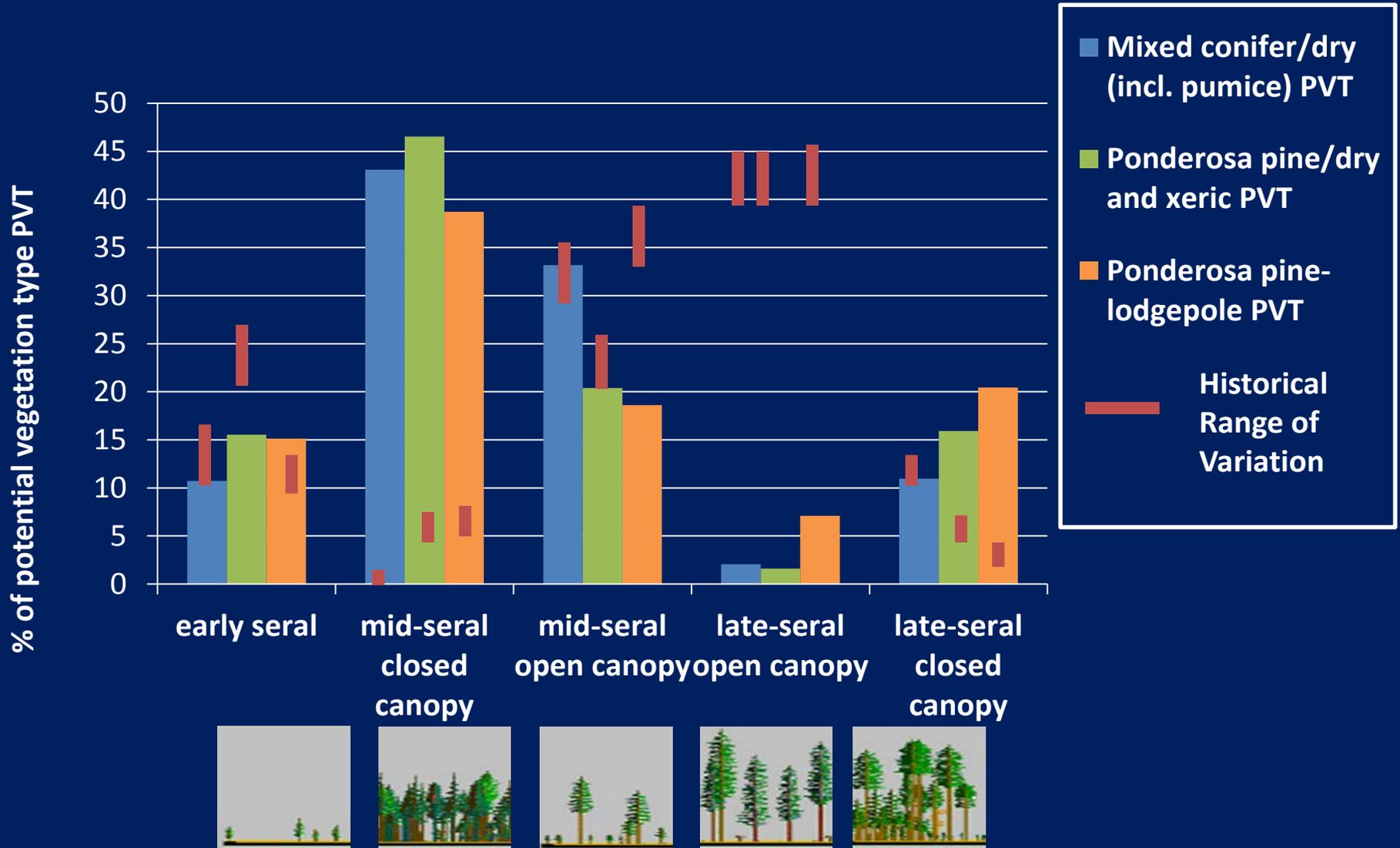
Taking a holistic approach to restoration that includes the restoration of dry forest landscapes, wildlife and fisheries habitat, aquatic and riparian resources, road decommissioning, recreation resources, and cultural and social values.



Departure Between Current Conditions and HRV

All Lands Within Klamath and Lake Counties

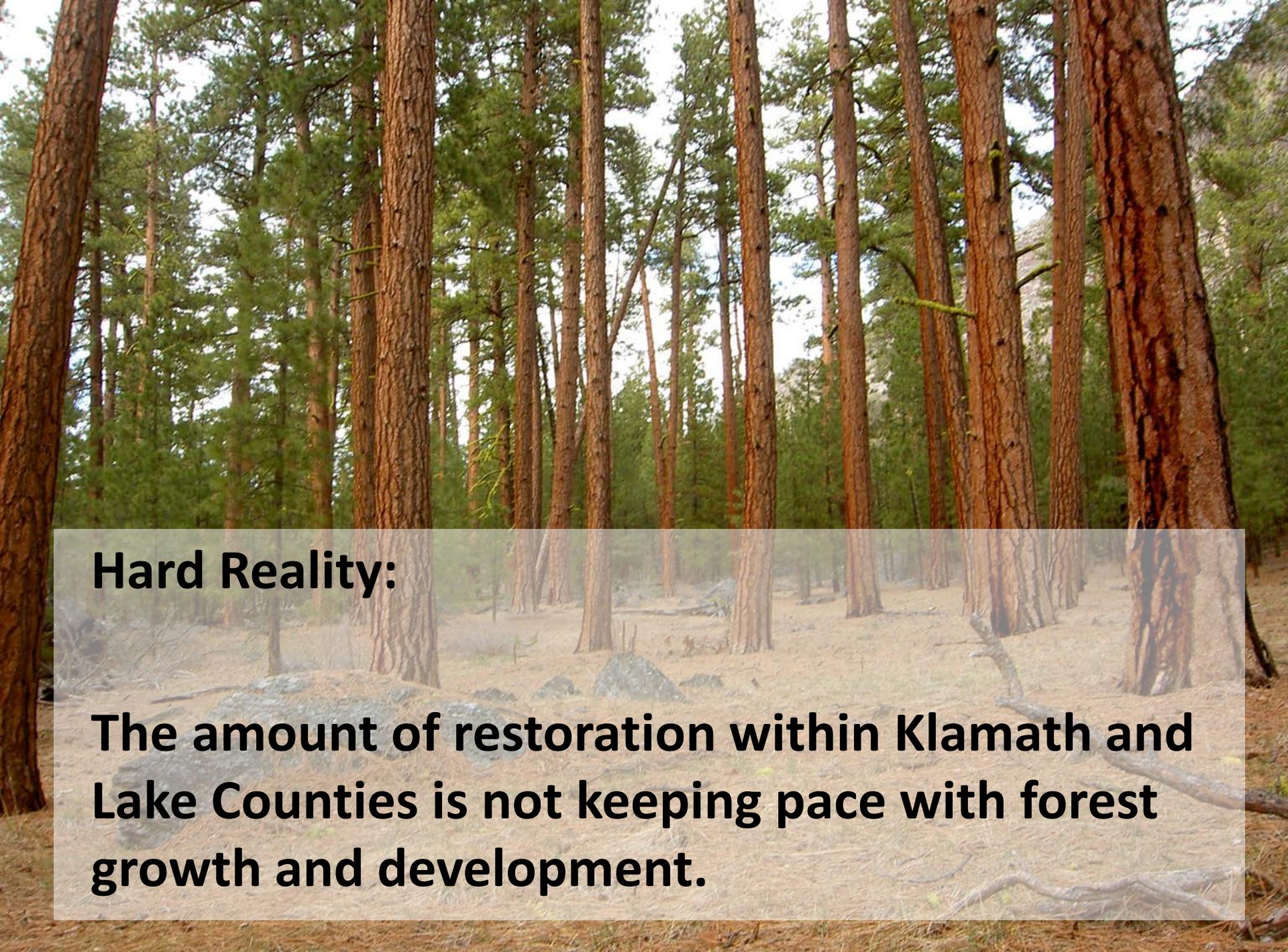
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Why the Urgency?

- Changes in forest structure lead to unusually large and severe wildfires and insect and disease outbreaks.
- Loss of valuable social and ecologic values.
- Will climate change further exacerbate these issues?





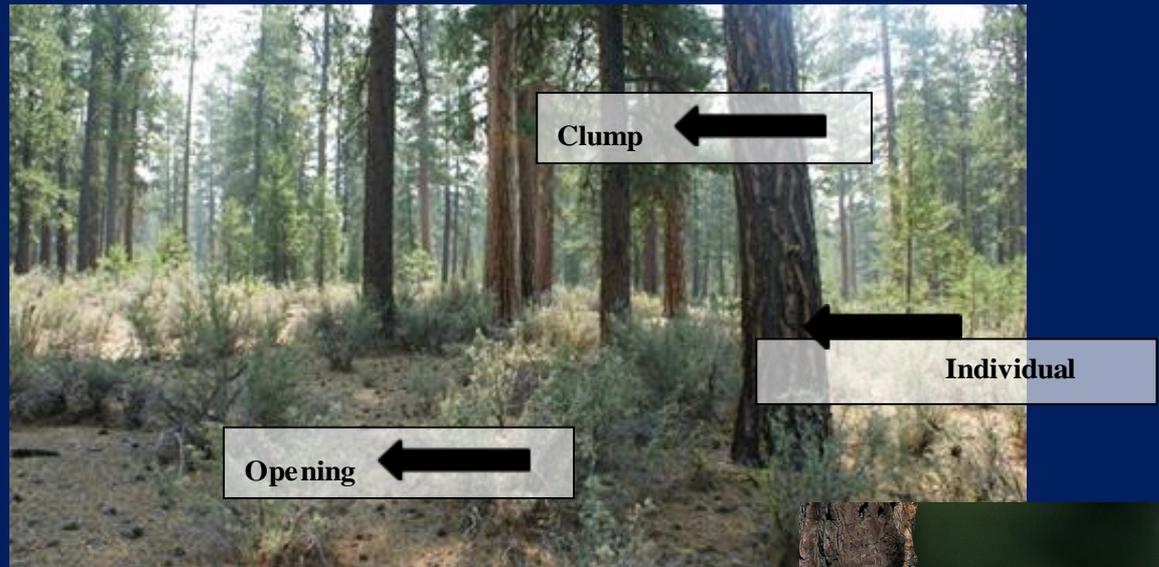
Hard Reality:

The amount of restoration within Klamath and Lake Counties is not keeping pace with forest growth and development.

A critical piece of integrated restoration is active forest management using tools such as commercial harvest, thinning, and prescribed fire.



Retention of large trees, skips, and gaps



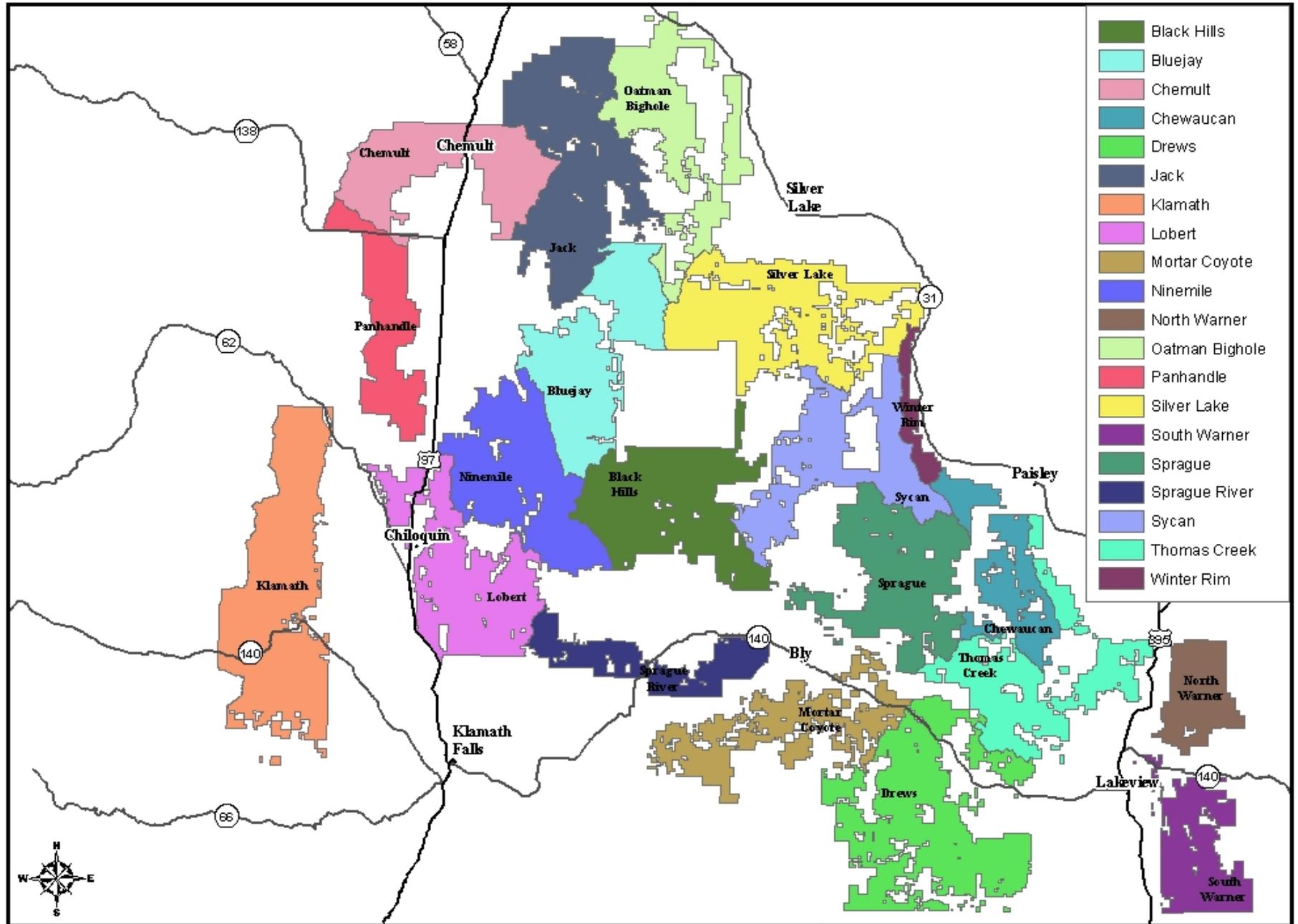
In a recent report prepared for Governor John Kitzhaber and Oregon's Legislative Leaders (2012), it recommends several steps to advancing landscape-scale forest restoration including:

1. Any effort to 'scale up' the pace of forest restoration on Oregon's Eastside National Forests will have to be accompanied by a large-scale planning effort led by the USFS.
2. Improving the efficiency of the USFS' planning and implementation will reduce total management costs creating the potential to accomplish more forest restoration.

Fremont-Winema National Forest Accelerated Landscape Restoration (ALR)

Delineation of restoration landscapes which
are generally >100,000 acres

Landscape Restoration Areas on the Fremont-Winema National Forest



0 10 20 30 40 Miles

Variables Used to Prioritize Landscapes

- **Regional and National Priorities**
- **Current Stand Structure by Plant Association**
- **Past Management**
- **Past Management within WUI**
- **WUI**
- **Crown Fire Potential**
- **Landscape Fire Opportunities**

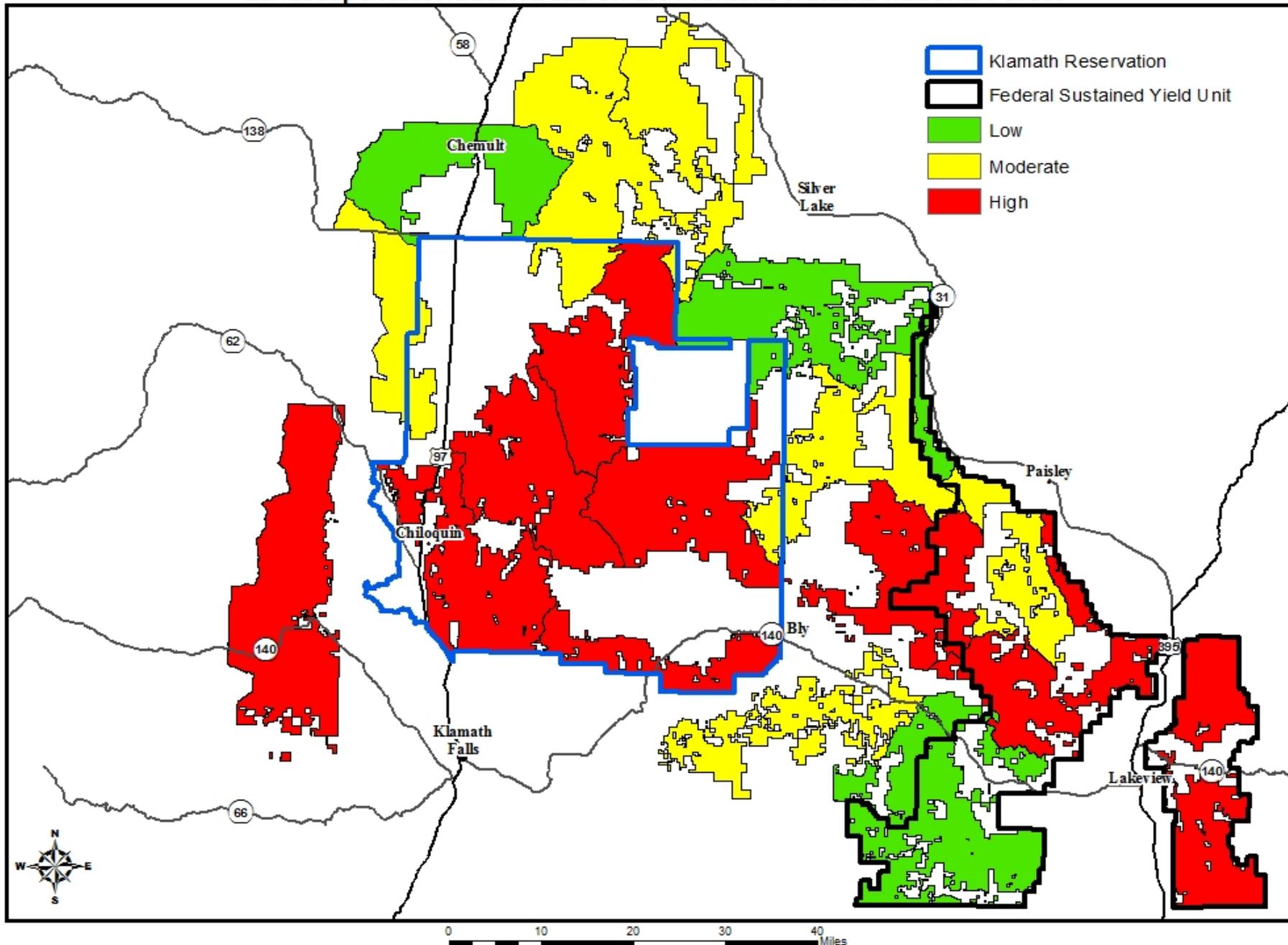
Green = Low Priority

Yellow = Moderate Priority

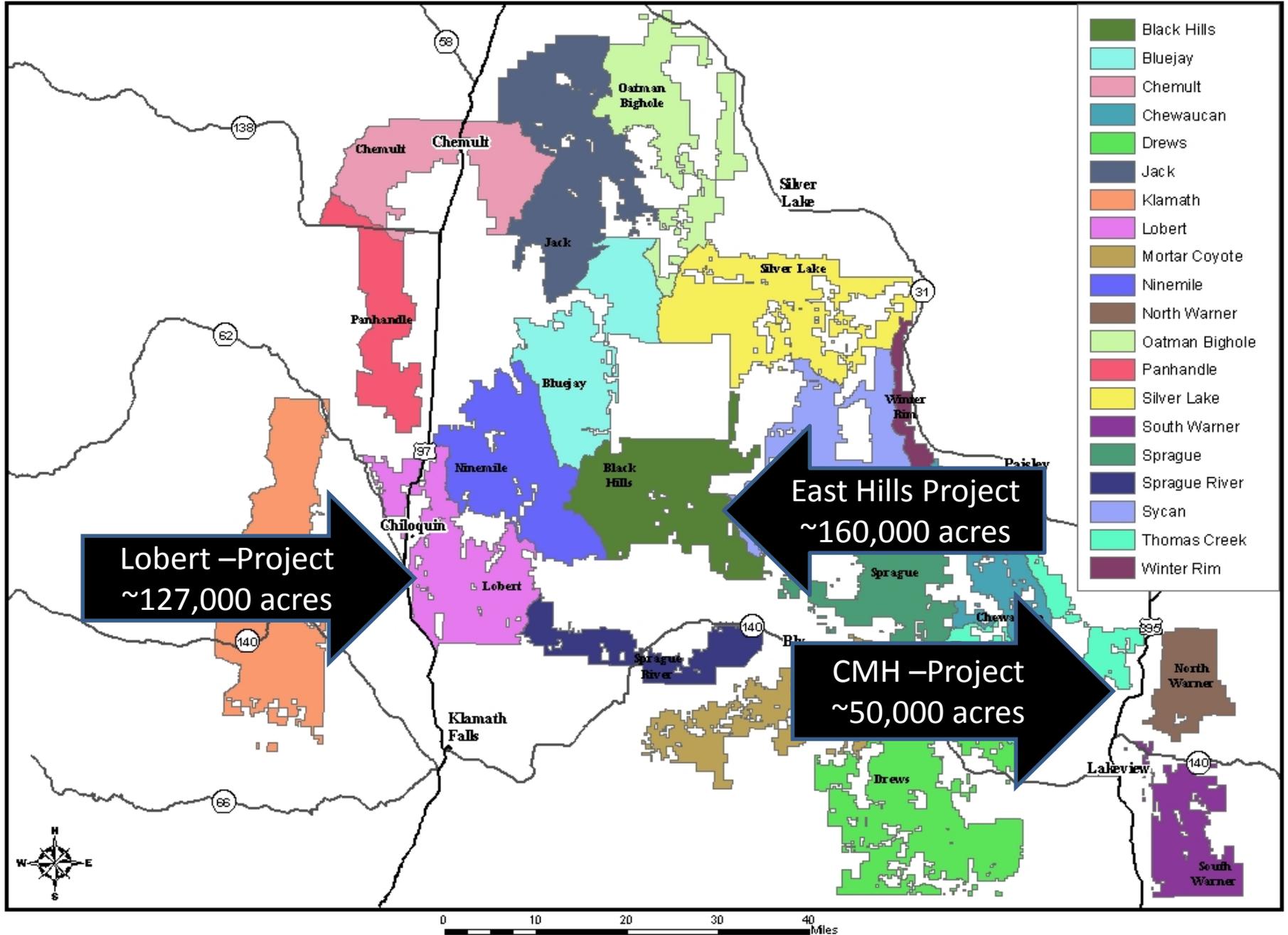
Red = High Priority

Landscape	Regional Priorities	Past Management	Past Management within WUI	Current Stand Structure by Plant Association Extra Large/Large	Current Stand Structure by Plant Association Extra Large/Large/Medium/Small	WUI	Crown Fire Potential	Landscape Fire Opportunities	Total
Winter Rim									0
Chemult		1	1						2
Drews						1		1	2
Silver Lake						1		1	2
Panhandle		1	1					1	3
Chewaucan	1				1			1	3
Jack	1	1	1						3
Morter Coyote			1		1			1	3
Oatman_BigHole		1	1					1	3
Sycan	1	1	1					1	4
Thomas Creek			1	2	1	1			5
Fort_Ninemile	1		1	2			2		6
Black Hills	1	1	1				2	1	6
Sprague River		1	1		1		2	1	6
Klamath	1	1	1	2		1			6
Bluejay	1	1	1	2			2		7
North Warner	1	1	1	2	1			1	7
Lobert		1	1	2	1	1	2		8
South Warner	1	1	1	2	1	1		1	8
Sprague	1	1	1	2	1		2	1	9

Priority for Restoration Landscape Restoration Areas on the Fremont-Winema National Forest



Landscape Restoration Areas on the Fremont-Winema National Forest

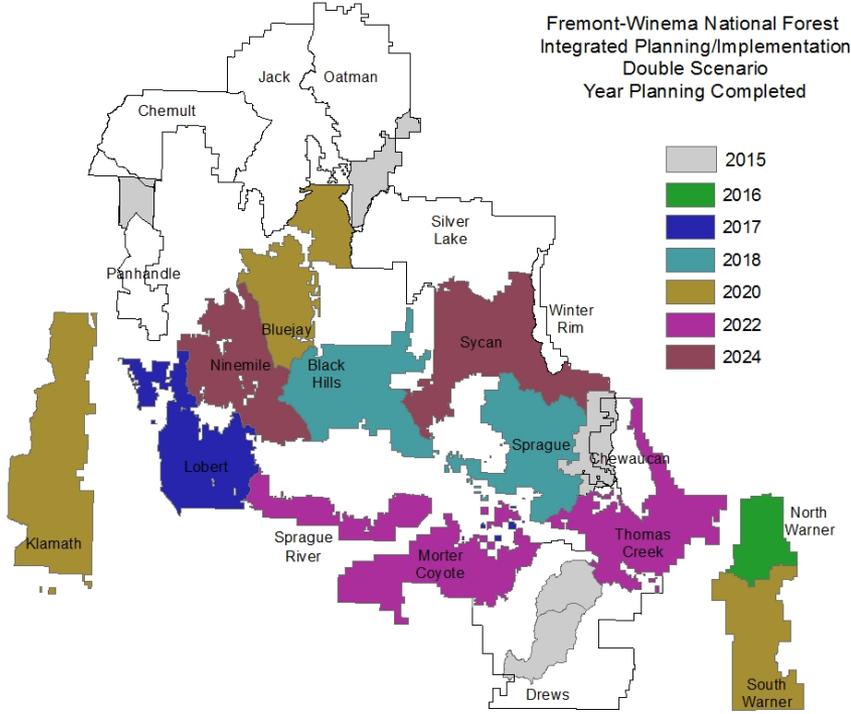


10 Year Restoration Plan

1. Provides a framework for how to accelerate restoration on the Forest.
2. Positions the Forest for success including the possibility of increased appropriated or outside partnership funding to support the program.

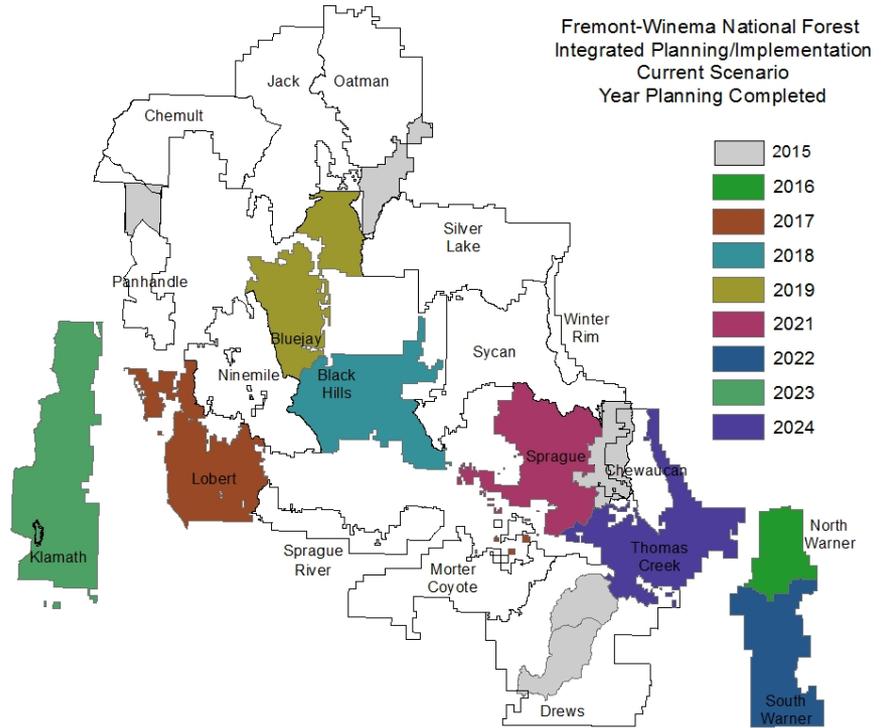
Evaluates forest restoration through commercial harvest based on 2 scenarios:

1. Current - 10,000-15,000 acres annually
2. Double - 20,000 – 30,000 acres annually



← Double Scenario

Current Scenario →



Lobert Restoration Project

Chiloquin Ranger District

Kelly A Ware: Westside Zone NEPA Planner
February 2016



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Planning at the Landscape Scale Successes and Challenges

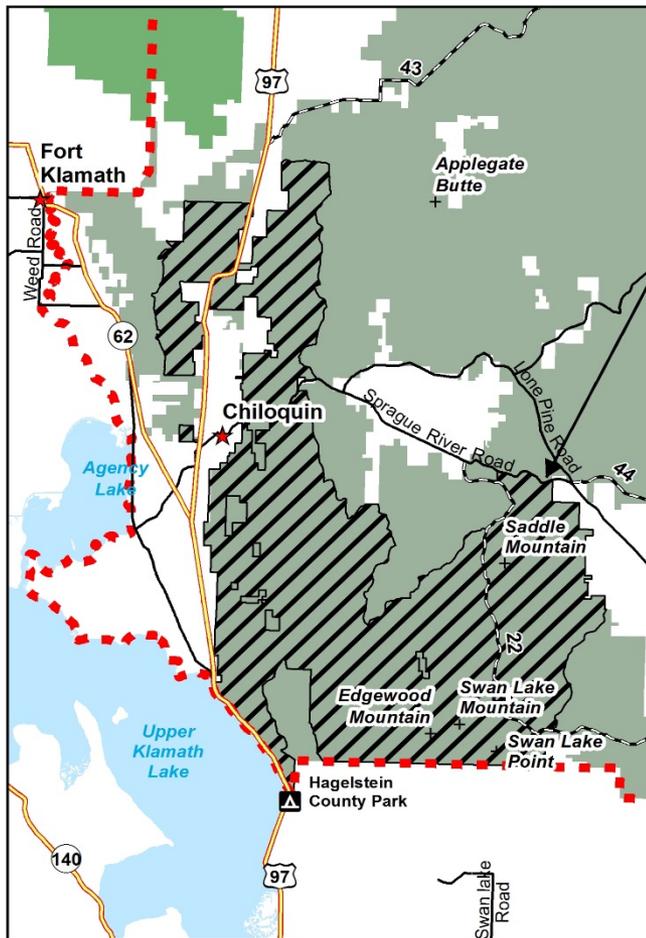
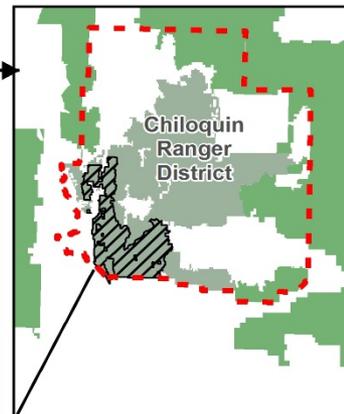
Background

- 97,500 acres
- 7 watersheds
- 75,134 acres w/in NWFP lands
- 22,348 acres w/in Eastside Screens



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Lobert Project Area Chiloquin RD, Klamath County, Oregon

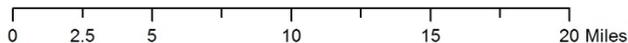


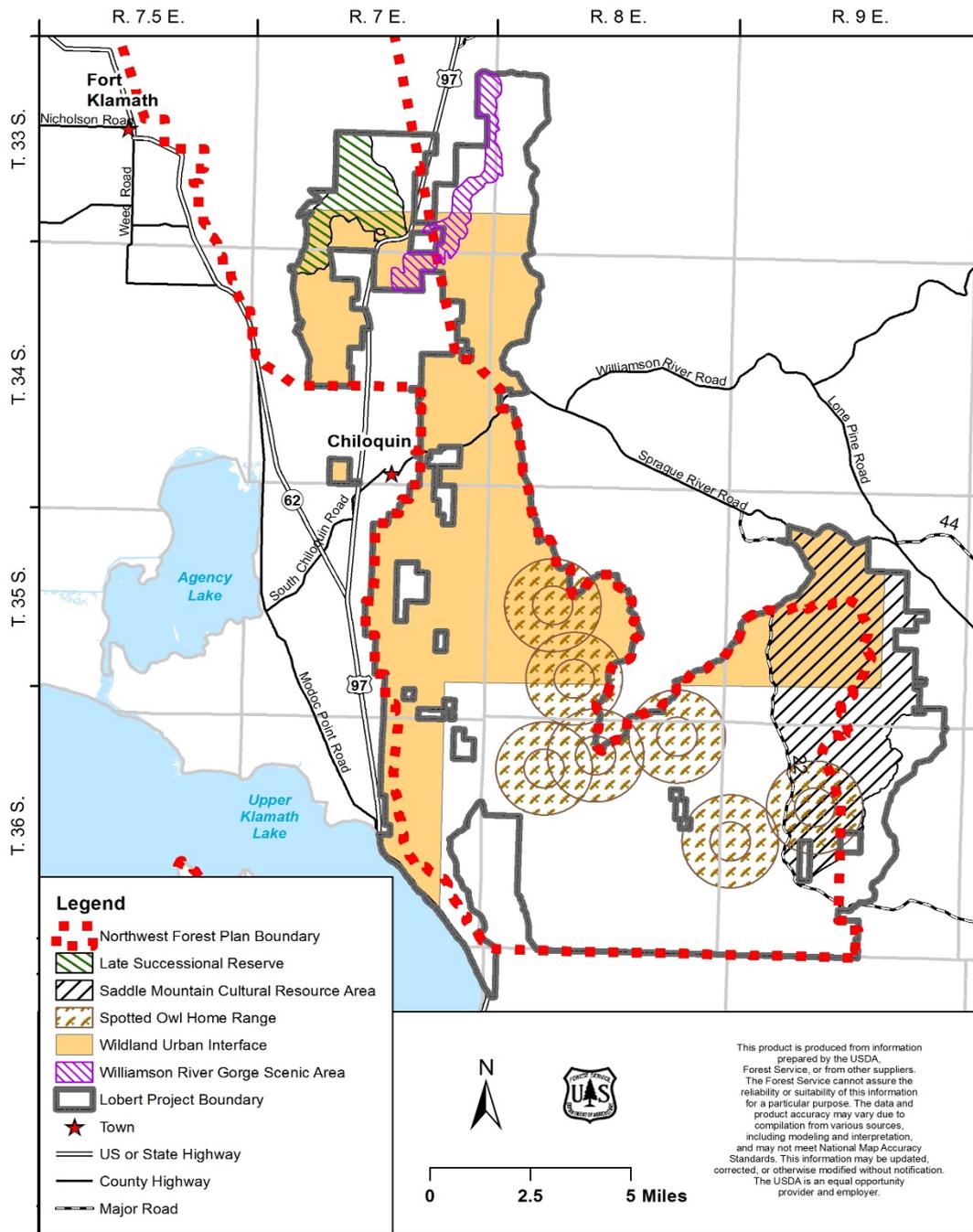
Legend

- ★ Town
- US or State Highway
- County Highway
- Major Road
- ▨ Lobert Project Boundary
- ▭ Chiloquin Ranger District
- Fremont-Winema National Forest
- ⋄ Former Reservation Boundary
- ⋄ 1954 Klamath Tribes



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Challenges

- Data collection on nearly 100,000 acres
- How to develop a Purpose and Need encompassing integrated landscape restoration?
- Multiple guiding documents
 - Winema LRMP – as modified by NWFP and Eastside Screens
 - Revised Recovery Plan for the Northern Spotted Owl
- Maintain timeline with a target for implementation in 2017



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Overcoming Challenges

- Focused IDT
- Active and Engaged Line Officers
- USFWS and Klamath Tribes are participating members on the IDT
- We have taken the needed time to fill in data gaps
- Enlisted help from the SO for other NEPA projects
- Selective in where we've focused our resources



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Successes

- Coordination with USFWS and Klamath Tribes
- Have a Purpose and Need that allows for full integrated restoration
 - Adaptive language to allow for riparian restoration treatments if need identified during implementation
- Following integrated approach used in Bluejay and Crooked Mud Honey projects
- Even with setbacks we are maintaining the timeline



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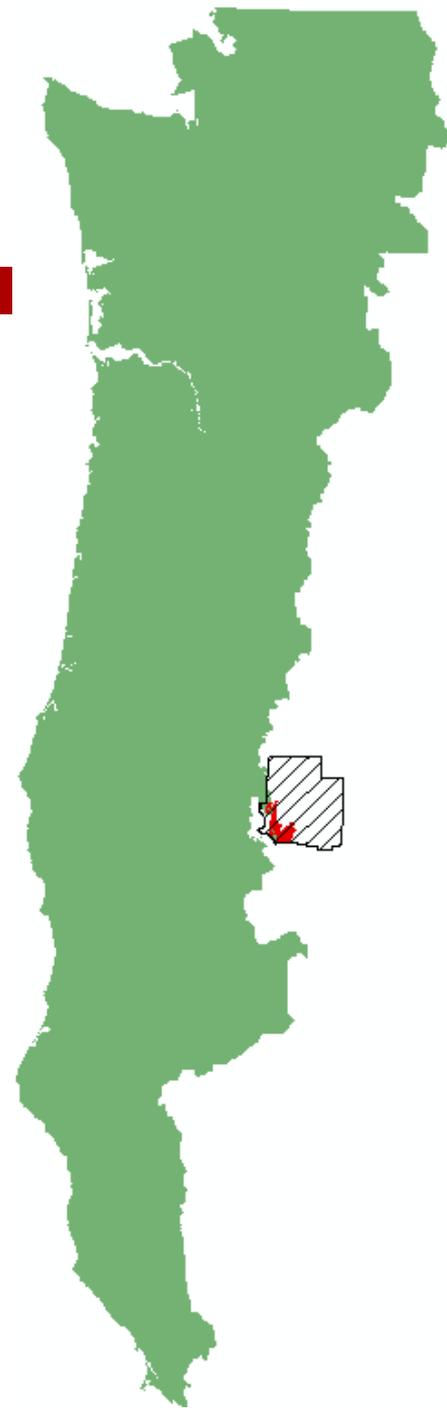


LOBERT RESTORATION EIS: *PROPOSED ACTION DEVELOPMENT*

Andrew Spencer: West Zone Silviculturist, Fremont-Winema National Forest
February 2016

Purpose

- The 100,000 acre Lobert project area is one of the eastern most portions of the Northwest Forest Plan separated by Lake Klamath, and entirely within the former Klamath Tribe Reservation Boundary.
- ▣ The IDT needed to balance multiple competing, often mutually exclusive objectives, a common feature of Eastside Spotted Owl Projects.
- ▣ After initial data collection was completed, we needed an efficient, impartial way to discuss these competing objectives and find some consensus where possible.
- ▣ While forest health was a very important consideration, the real challenge was balancing Spotted Owl needs (and acceptable loss) against the probability of stand replacing fire and species conversion (and acceptable risk)



Data Collection for PA development

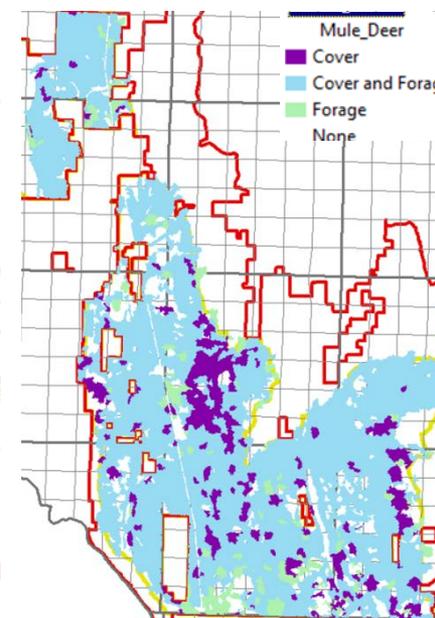
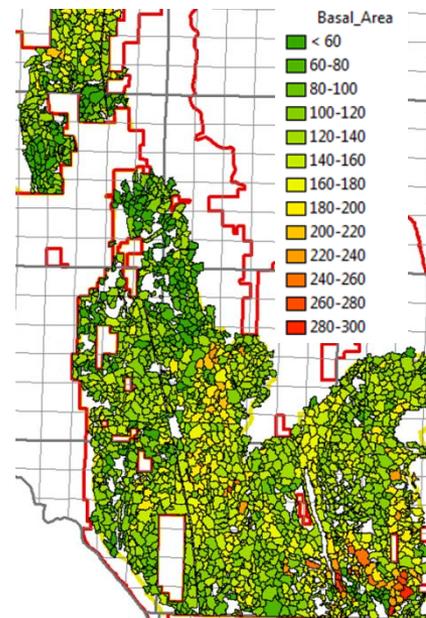
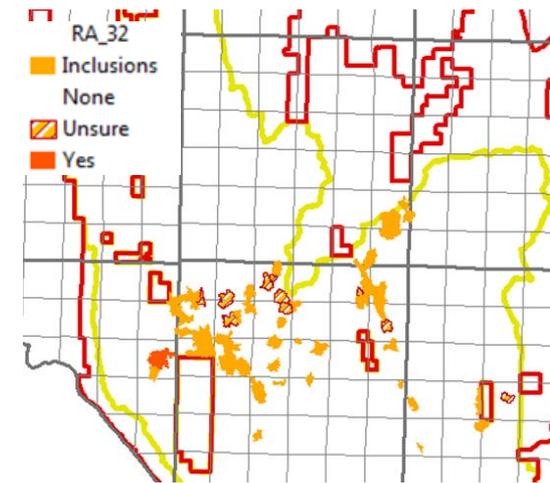
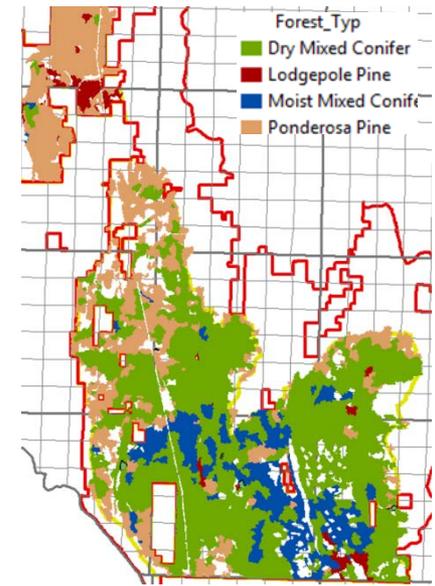
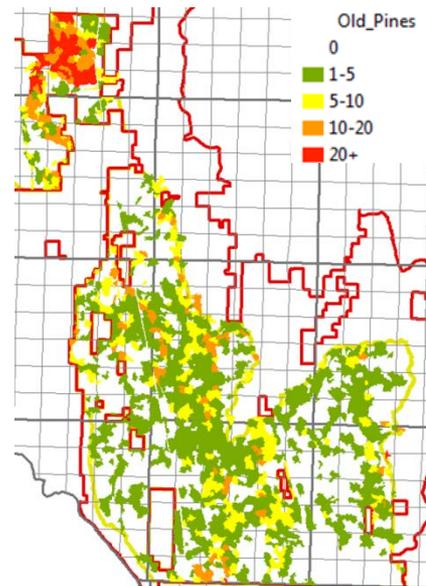
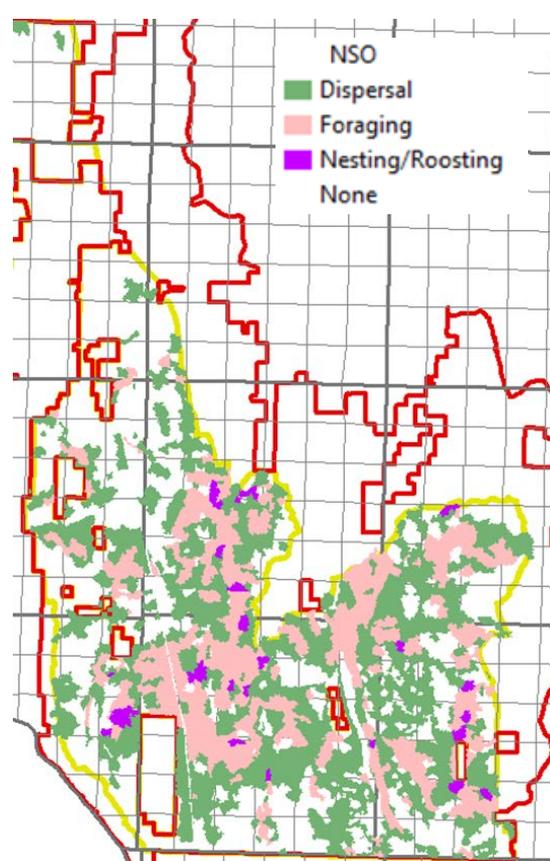
- What do we have available?
 - ▣ Lidar? Not really
 - ▣ Stand Exams? Not really, a few dozen from the 1990s
 - ▣ Habitat data? Corporate layers from the 1990s
 - ▣ GNN? Yes- what can we use it for?

- What do we need and why do we need it?
 - ▣ Lidar? No time, no money.
 - ▣ Stand Exams? Ok, why, how much, and where?
 - ▣ Habitat Assessments? Ok, why, how much and where?

What did we do?

- Stand Exam Process:
 - ▣ Developed a process for stratification and imputation with the FSVeg cadre- among the first projects done from scratch with no existing data
 - ▣ Stratified using Landsat, Climate model, and DEM. Cluster sampled stands (extensive level tree list only using accepted BMPs) in 2014

- Habitat Assessment Process:
 - ▣ Old habitat data was remote sensed, combining Nesting/Roosting function with Foraging. New science supports separating these into two- we developed and agreed on a process with the USFWS.
 - ▣ Used GNN to eliminate lightly stocked stands from field analysis. Narrowed the field sampled portion to the NWFP boundary only
 - ▣ At the stand level, crews assessed a number of attributes in the field. Data was collected in a geodatabase with dropdowns using trimble devices.
 - Process flow: before assessing the habitat quality, determine and record the overall basal area, forest type, structural stages and overstory size classes. This was a logical progression before making a call and it provided other useful information.
 - Silviculture managed the data and directed the field crews, USFWS and USFS biologists provided quality control in the field.



Field Collection vs. Remote Sensing

- Remote, on the left:

- Dispersal: 28,193 acres

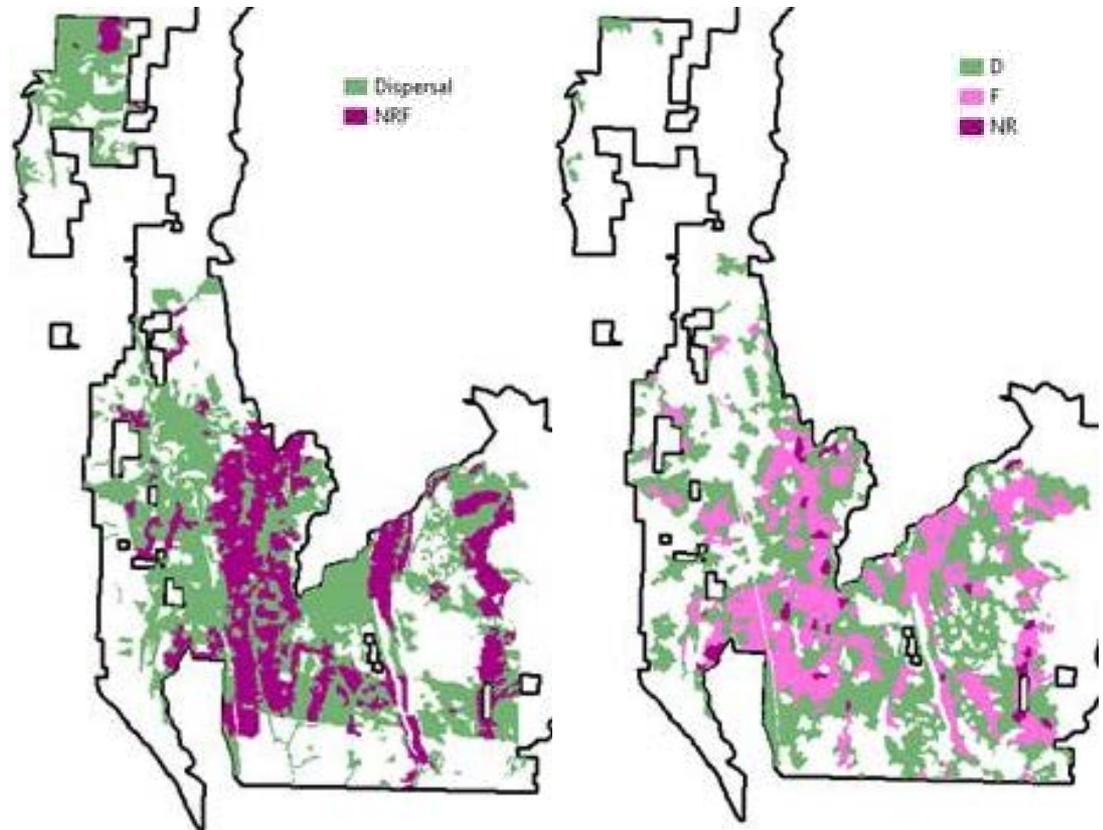
- NRF: 14,171 acres

- Field, on the right:

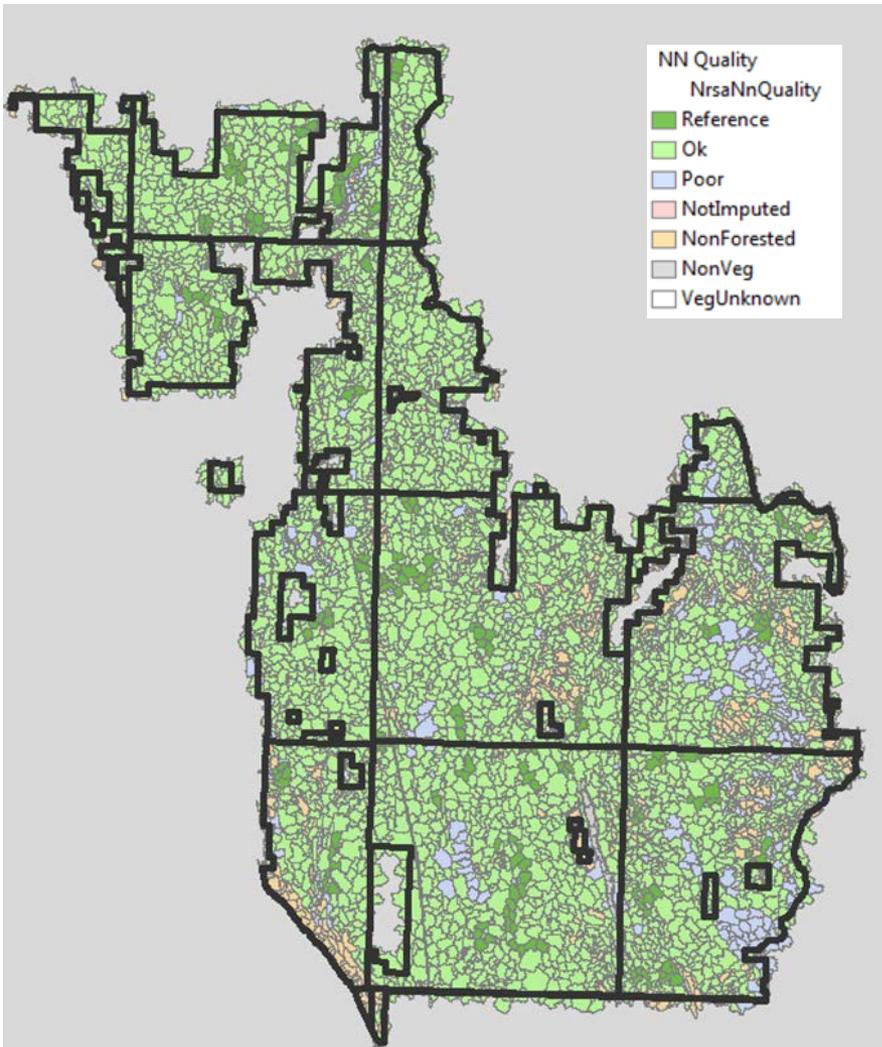
- Dispersal: 24,365 acres

- Foraging: 14,610 acres

- Nesting-Roosting: 977 acres



Stand Exam Results



FSVeg Spatial Data Analyzer Nearest Neighbor Report

2014-12-08 14:31:23
Dataset: Lobert_CSE_ImputationParent
Method: msn2
Scenario: ADV_SO_MSN2
Description: Most-Similar Neighbor 2(MSN2) imputation for the SO FVS Variant.

Use the following information to evaluate the run.
As with any statistical package, care should be taken when using the results.

MSN2 Evaluation Info

For a statistically valid run, it is recommended that all of these checks pass before using the output of this imputation run.

CHECK 1: Check for Statistical Validity

Number of variates used is: 9
Variate check: Adequate number of variates

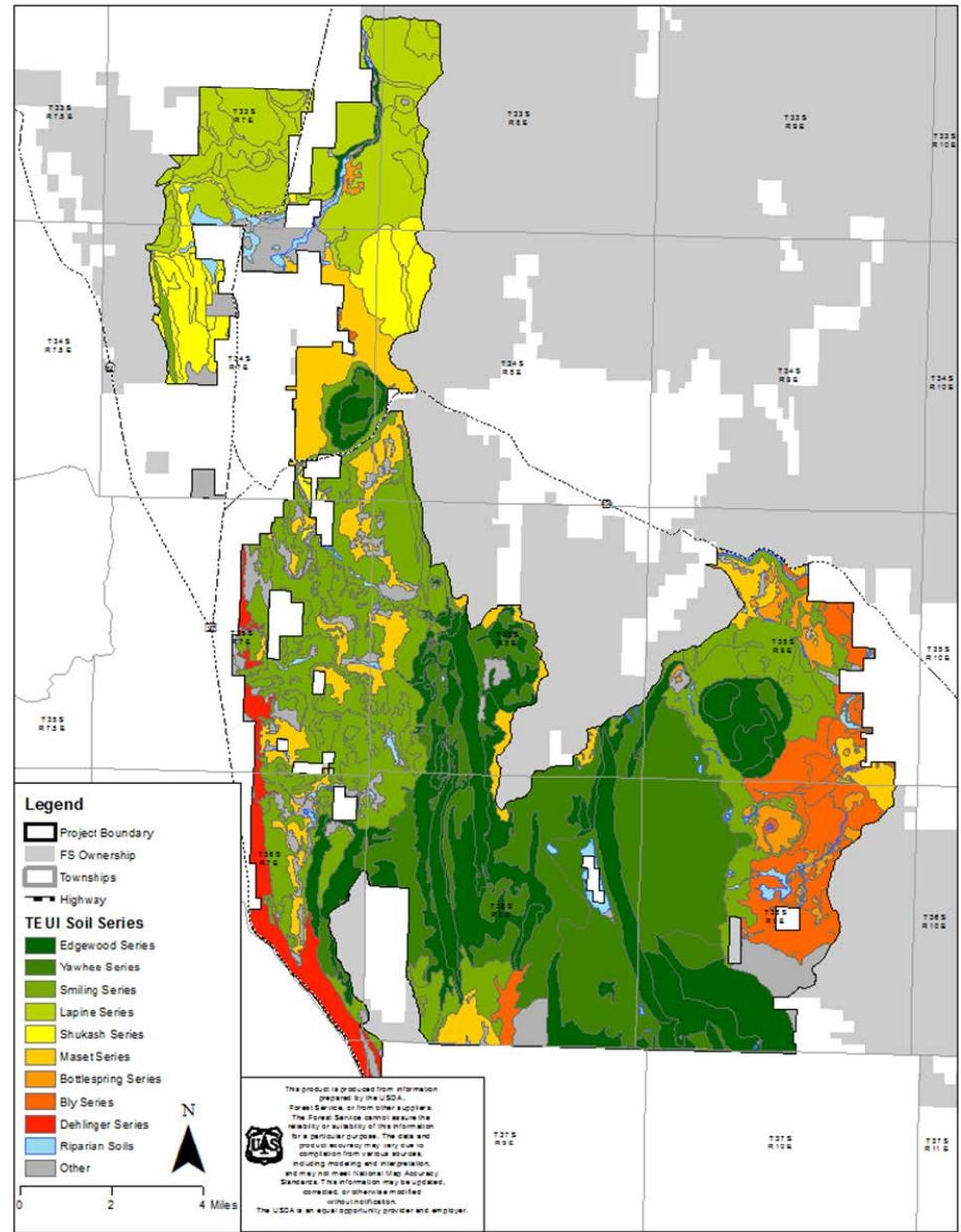
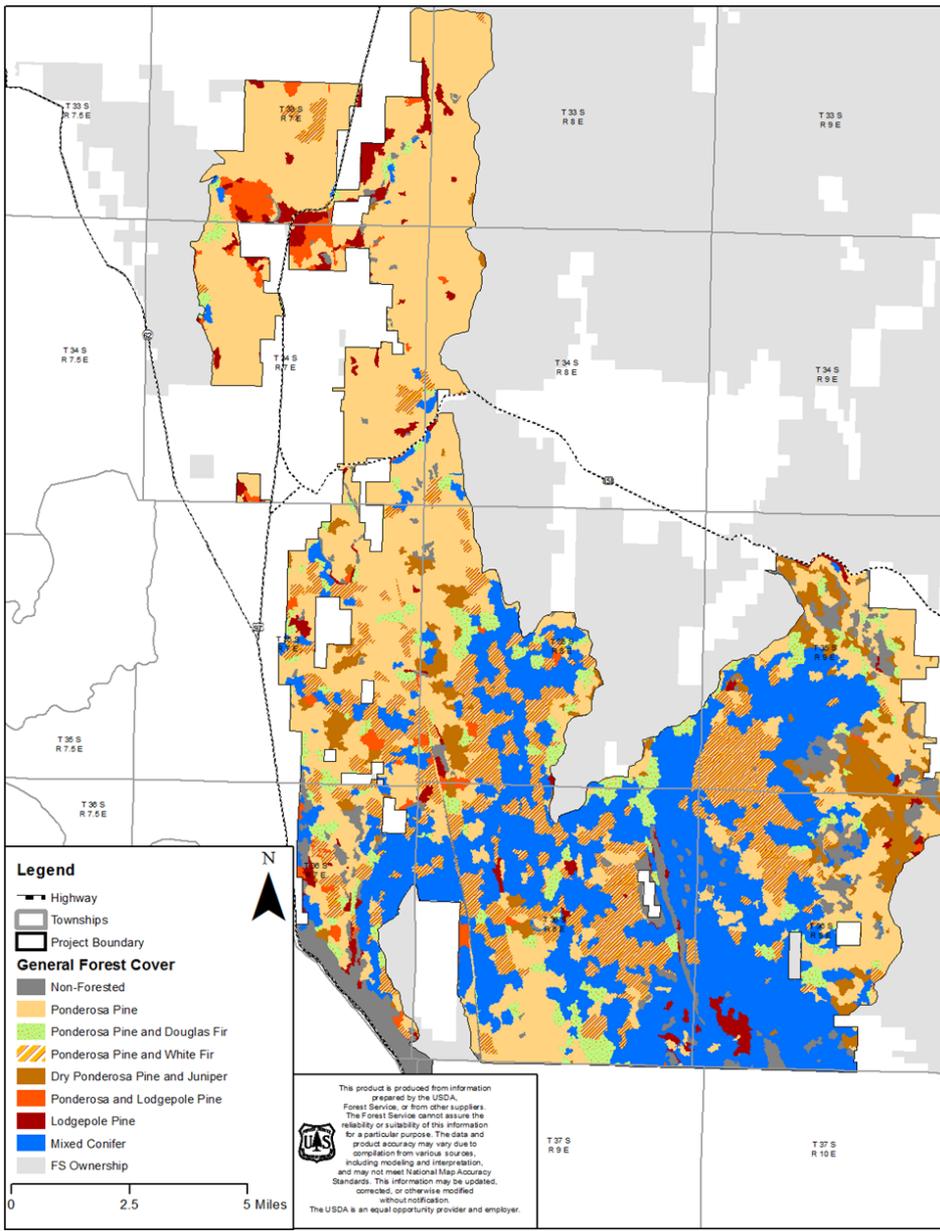
CHECK 2: Check for the quality of the Run

Canonical R Squared of 1st variate is: 0.913307807295482
Canonical R Squared of the 1st variate check:
Adequate canonical R squared of the 1st variate

Canonical R Squared of the First Variate, evaluation information:

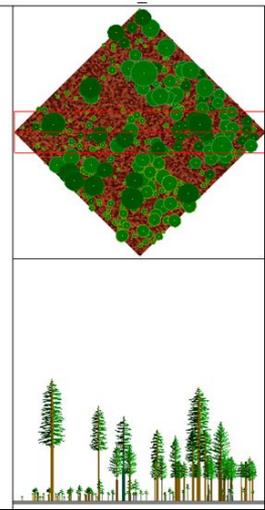
Value	Evaluation Information
< .6	Not suggested for use without further review.
.6 - .7	Generally for broad general use without further review.
.7 - .8	Generally considered adequate for project use.
> .8	Generally considered dependable for EA modeling.

Stand Imputation and TEUI Productivity



Combining Habitat and CSE Data

- Both methods used the same stand boundaries
- The habitat can be modeled and grown under different management strategies



The Typical Dispersal Stand in Lobert in FVS

- ▣ Multiple canopy layers
- ▣ Ponderosa pine overstory
- ▣ Douglas fir mid-story,
- ▣ white fir understory.
- ▣ 150 ft²/ac
- ▣ SDI294

	Dispersal	
	Historical ¹	Current ²
Live BA ft ² /ac	84	149
SDI	116	288
QMD	21.9	8.8
Species Composition (% Total BA)		
%Ponderosa	57	45
%White Fir	33	45
%Douglas Fir	7	6
%Other	3	4

¹ The process described above resulted in 605 areas (35,418 acres of surveys) that now contain Dispersal, 359 areas (21,685 acres of surveys) that now contain Foraging and 27 areas (1,380 acres of surveys) that now contain Nesting-Roosting habitat. Here the mean is shown. Refer to Hagman et al. (2013) for a description of the survey methodology

² Current condition of these habitats was quantified using common stand exam methods: 25 Stands (105 Plots) in Dispersal which had an average of 47% Canopy Cover, 14 Stands (57 Plots) in Foraging which had an average of 54% Canopy Cover, and 5 Stands (15 Plots) in Nesting-Roosting habitat that had an average of 66% Canopy Cover.

Method

- The use of a threshold rather than a set of gradients can help to reduce the error involved when comparing multiple variables in natural resource management
 - ▣ Combining 50 shades of green to 20 shades of gray gives you a thousand shades of greenish-gray: its confusing, repetitive and doesn't mean much
- Keane et al. (2008) in addressing how to analyze multiple values regarding fire risk:

The Problem: "A typical example would be merging the three layers of flame length, surface fuel model, and canopy bulk density to create a fire hazard map; two layers describe continuous variables with different units, while the third is a categorical variable with nominal categories. Each layer has a unique spatial error distribution, mapping resolution, map scale, and computational detail that is complicated and compromised when merged."

Possible Solution: "A step in the right direction would be to explicitly set a threshold value for continuous maps or set of values for categorical maps, above which fire hazard is high and below which hazard is low to use to create a binary variable data layer that can then be merged with other binary maps."

Method

- Each specialist boiled down their resource to the most basic, most important considerations for a landscape, and to document them with peer reviewed literature:
 - ▣ Silviculture: Ponderosa associations and SDI for resilience, productivity
 - ▣ Fuels: Ponderosa associations/FRCC, SW Slopes, WUI designation
 - ▣ Wildlife: Multiple MIS species and habitat considerations
 - Perhaps the most complex: multiple species and management direction were considered for each, ie. NSO home range/core
- Forest Plan direction and soil productivity were also used in refining objectives for each stand
- Archeological sites and riparian areas were considered in a second phase of refinement because spatially they were much smaller than the general forested area.

The Attribute Table:

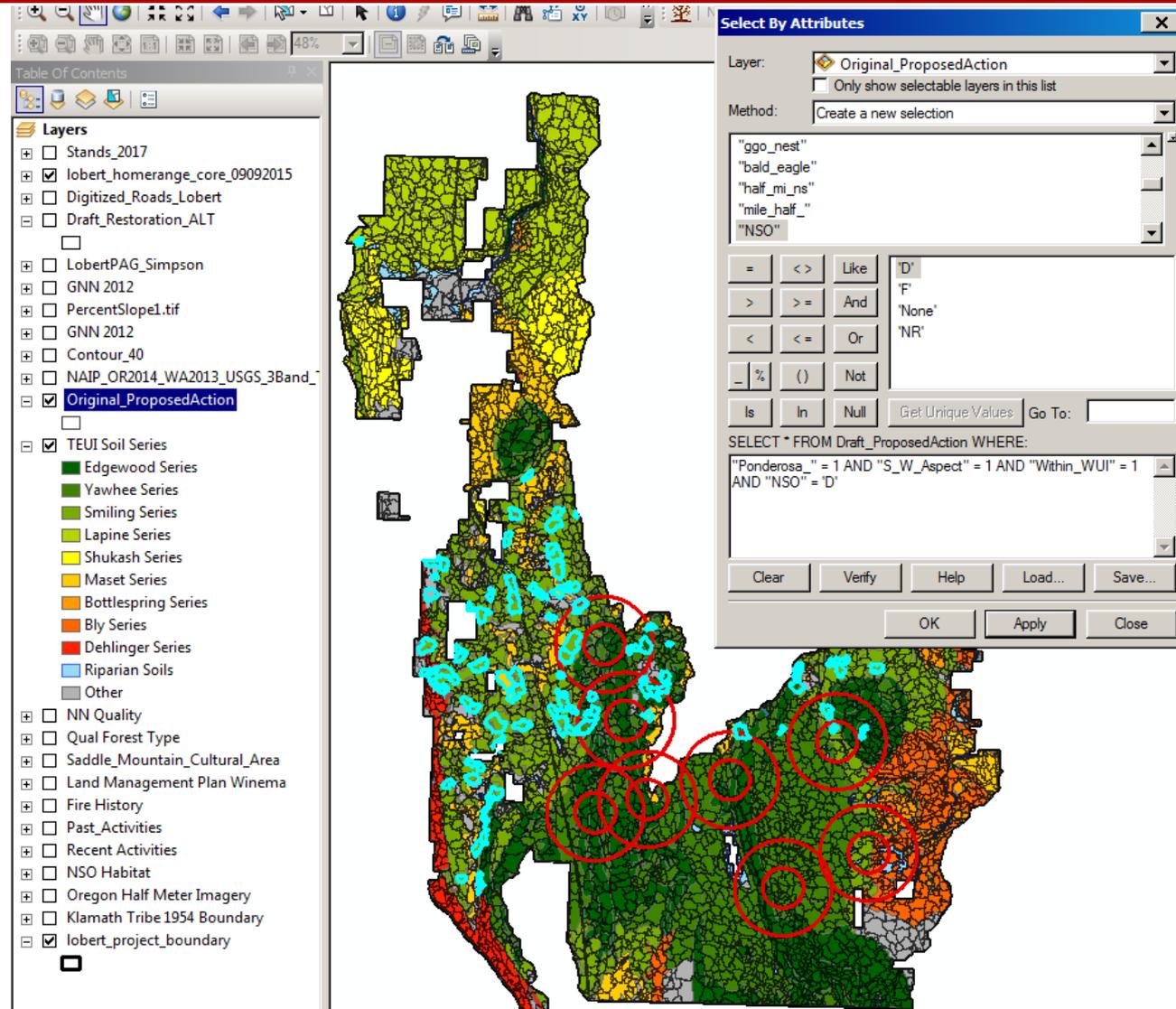
Original_ProposedAction																			
	ACRES	SDI_Over_1	Ponderosa	S_W_Aspect	Within_WUI	goshawk_pf	goshawk_ne	ggo_nest	bald_eagle	half_mi_ns	mile_half_	NSO	RA_32	Old_Pines	LRMP_progH	Slope	Treatment_		
	0.001147	0	0	0	1	0	0	0	0	0	0	0	None			1	1	restoration	
	0.003354	0	0	0	1	0	0	0	0	0	0	0	None			1	1	restoration	
	0.002403	0	0	0	1	0	0	0	0	0	0	0	None			1	1	restoration	
	0.001871	0	0	0	1	0	0	0	0	0	0	0	None			1	1	restoration	
	77.551553	1	0	1	0	0	0	0	0	1	0	F	NA	1-5		1	0	no treatment owl	
	41.778601	1	0	1	0	0	0	0	0	0	1	F	NA	5-10		1	1	Foraging RA10	
	34.944415	1	0	0	0	0	0	0	0	1	0	NR	U	5-10		0	1	no treatment owl	
	26.723389	1	0	1	0	0	0	0	0	1	0	D	U	5-10		1	0	no treatment owl	
	30.913872	1	0	1	0	0	0	0	0	0	1	F	NA	1-5		1	0	Foraging RA10	
	18.416269	1	0	0	0	0	0	0	0	1	0	D	NA	1-5		0	0	no treatment owl	
	53.45779	1	0	1	0	0	0	0	0	1	0	F	I	1-5		1	0	no treatment owl	
	17.253886	1	0	1	0	0	0	0	0	1	0	F		0		1	1	no treatment owl	
	14.877721	1	0	0	0	0	0	0	0	1	0	NR	NA	1-5		0	1	no treatment owl	
	14.449837	0	1	0	1	0	0	0	0	0	0	0	None	NA	0		1	0	restoration
	0.003445	0	1	0	1	0	0	0	0	0	0	0	None	NA	0		1	0	restoration
	0.014729	0	1	0	1	0	0	0	0	0	0	0	None	NA	0		1	0	restoration
	25.358802	1	1	0	1	0	0	0	0	0	0	0	None	NA	0		1	0	restoration
	18.18695	1	0	0	1	0	0	0	0	0	0	0	None	NA	1-5		1	0	restoration
	23.326748	1	1	0	1	0	0	0	0	0	0	0	None	NA	0		1	0	restoration
	40.161545	1	1	1	1	0	0	0	0	0	0	0	None	NA	0		1	1	restoration
	53.726641	1	1	1	1	0	0	0	0	0	0	0	None	NA	0		1	0	restoration
	19.210967	0	1	0	1	0	0	0	0	0	0	0	None	NA	1-5		1	0	restoration
	29.340305	0	1	1	1	0	0	0	0	0	0	0	None	NA	0		1	1	restoration
	24.871041	1	1	1	1	0	0	0	0	0	0	0	None	NA	1-5		1	0	restoration
	105.250703	1	1	0	1	0	0	0	0	0	0	0	D	NA	0		1	0	no treatment owl
	88.738396	0	1	0	1	0	0	0	0	0	0	0	None	NA	0		1	0	restoration
	06.126357	1	1	1	1	0	0	0	0	0	0	0	None	NA	1-5		1	0	restoration

Example 1:

- SW Aspects
- Ponderosa stands
- In the WUI
- NSO Dispersal habitat
- Look at site productivity and owl home ranges:

Where do we need to maintain owl habitat, and where do other values outweigh those concerns?

What other considerations help us make the decision?

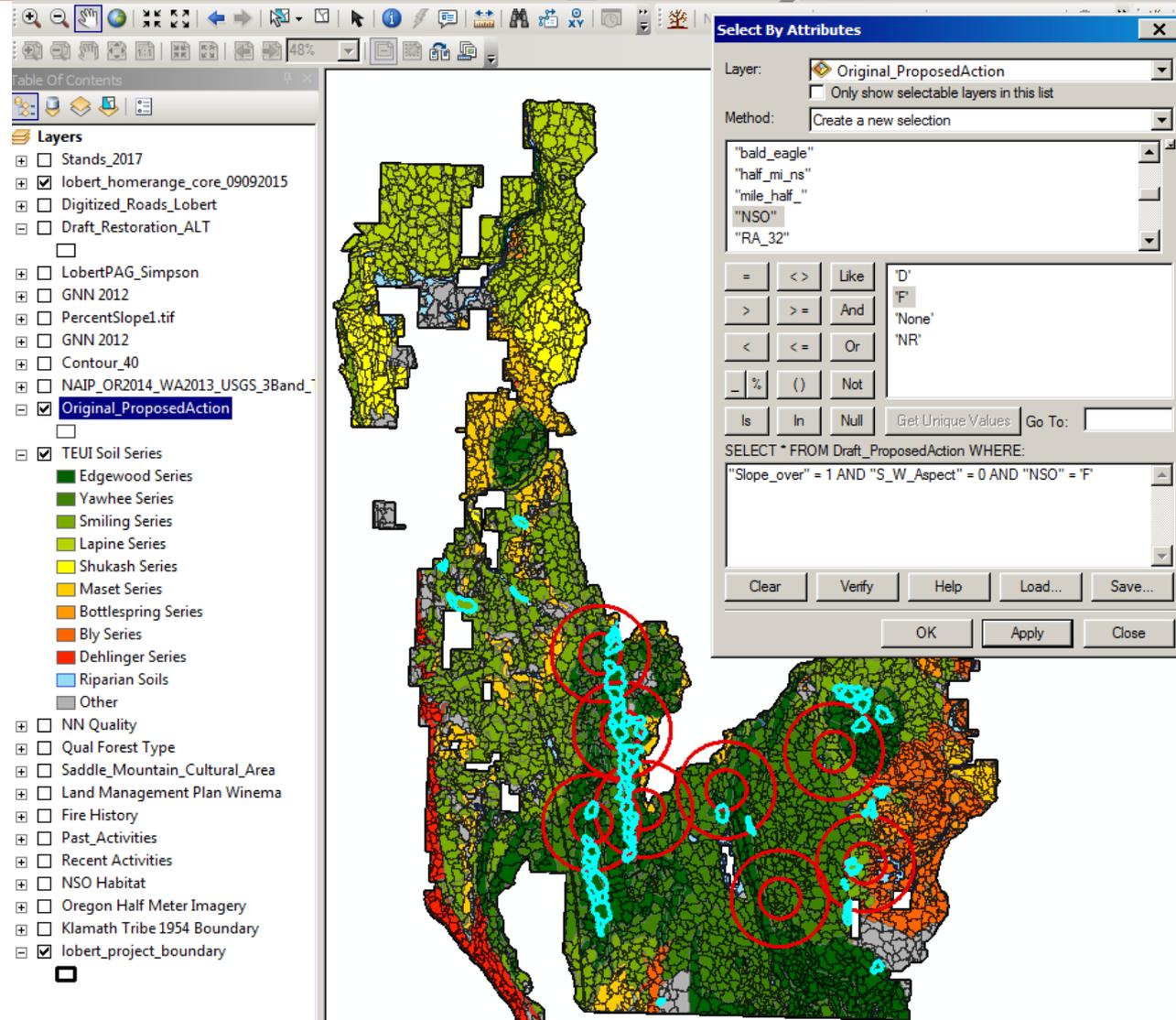


Example 2:

- Steep ground
- NE aspects
- NSO foraging habitat
- Look at site productivity and owl home ranges:

What areas should be left undisturbed for owl productivity and connectivity?

Does it make sense on the landscape, LRMP support?



Successes

- Overall, the approach was effective:
 - We started from firm ground by basing all of our resource criteria on peer reviewed literature, forest level white papers, the Recovery Plan and LRMP direction.
 - It allowed the core IDT to ask meaningful questions about tradeoffs and then use GIS to query the data accordingly on the spot and make decisions as a group.
 - We could get the “low hanging fruit” done quickly without conflict and focus our discussion where it mattered:
 - “Select all non-owl habitat in the WUI, that are pine stands with a high SDI: do we need to debate these areas further?”
 - About 80% of the discussion was about 20% of the area

Challenges

- It was a coarse scale approach that required refinement to roads, logical boundaries, including consideration of archeological sites and riparian areas afterwards.
 - ▣ Ultimately this was planned for, and not a significant barrier

- There was sticker shock on both sides:
 - ▣ Tribal consultants from OSU and the Klamath Tribal Natural Resource department wanted to revisit for more aggressive restoration options
 - ▣ Wildlife biologists wanted to revisit and be more conservative

- The Proposed Action was developed at one time with a landscape scale approach and site by site adjustments were more difficult to accommodate without revisiting the landscape scale objectives.
 - ▣ If we add more here, do we change it there, shift it here?”

Partnership within Lake and Klamath Counties

- Klamath-Lake Forest Health Partnership (KLFHP)
Non-profit
- “All lands” approach associated with FS projects
- Feb. 17th 2015 *“How Can We Partner in Lake and Klamath Counties to Increase the Pace and Scale of Restoration”*
- June 13th 2015 *“How Can We Partner to Implement the Cohesive Strategy”*





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