

A Foundation for Integrating Wildlife & Restoration Objectives in Cascadian Dry Forests

John F. Lehmkuhl

U.S. Forest Service

Pacific Northwest Research Station

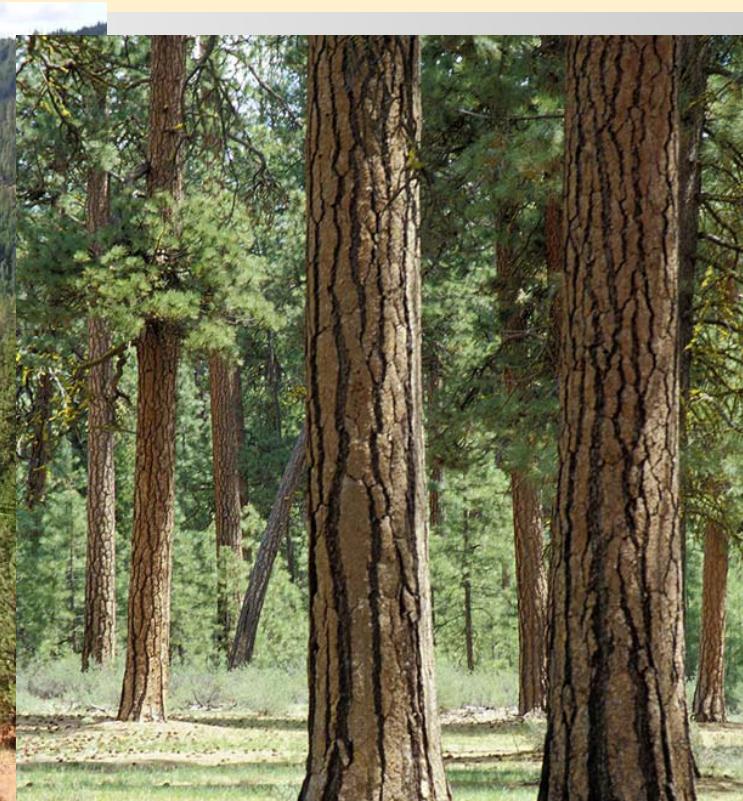
Wenatchee, Washington



Pacific Northwest Research Station
USDA Forest Service



Eastside Cascades diverse forest cover types with weaker management effect in a dynamic disturbance regime



**This shameful waste
WEAKENS AMERICA !**

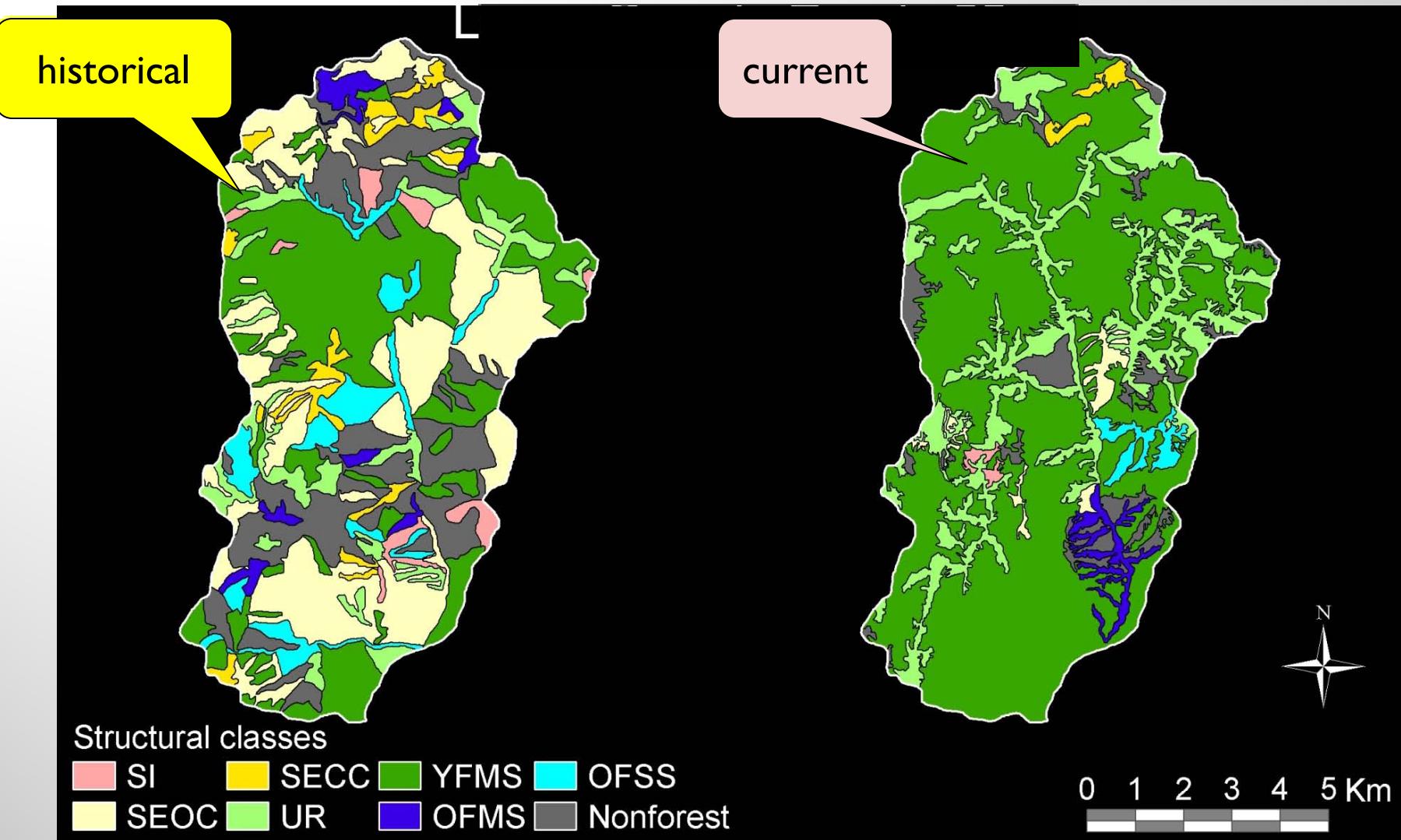


Remember—Only yo

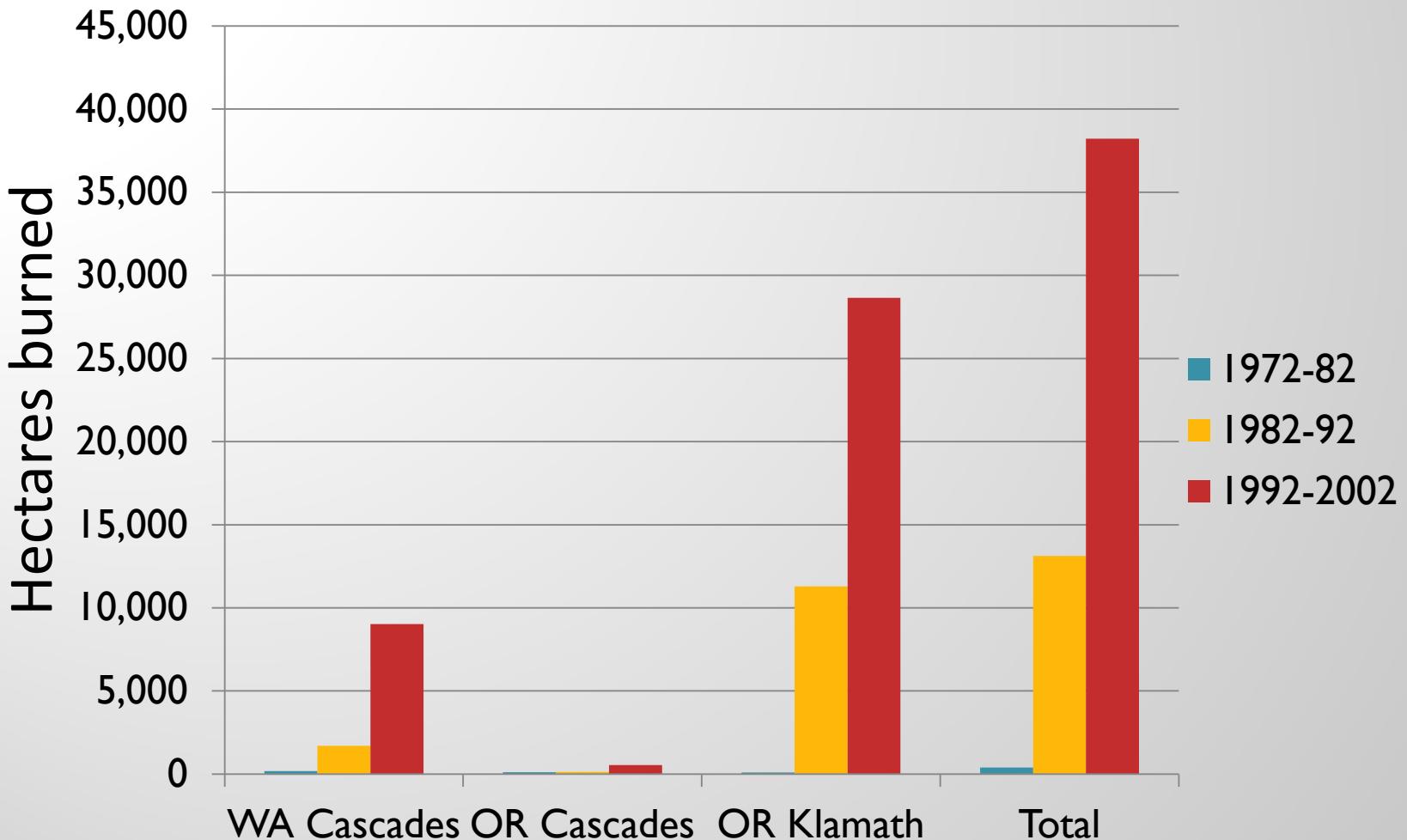
PREVENT THE MADNESS!



Significant re-patterning of landscape has occurred last 100 years (Hessburg et al. 2005)

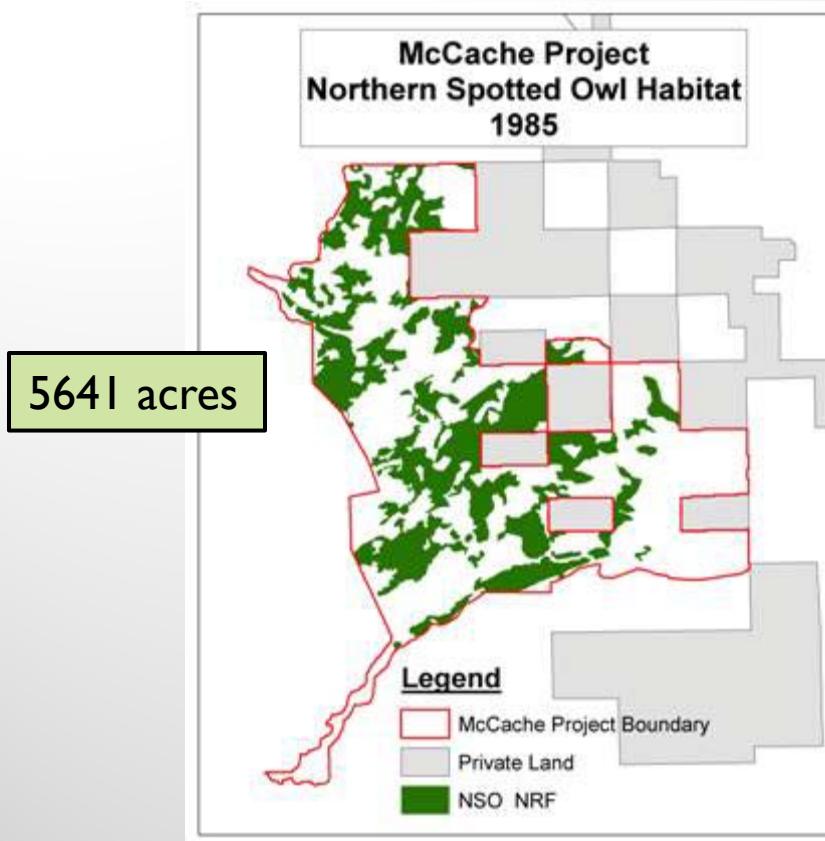


Area stand-replacement fire in dry forest provinces increasing, 1972-2002 (Healey et al. 2008)

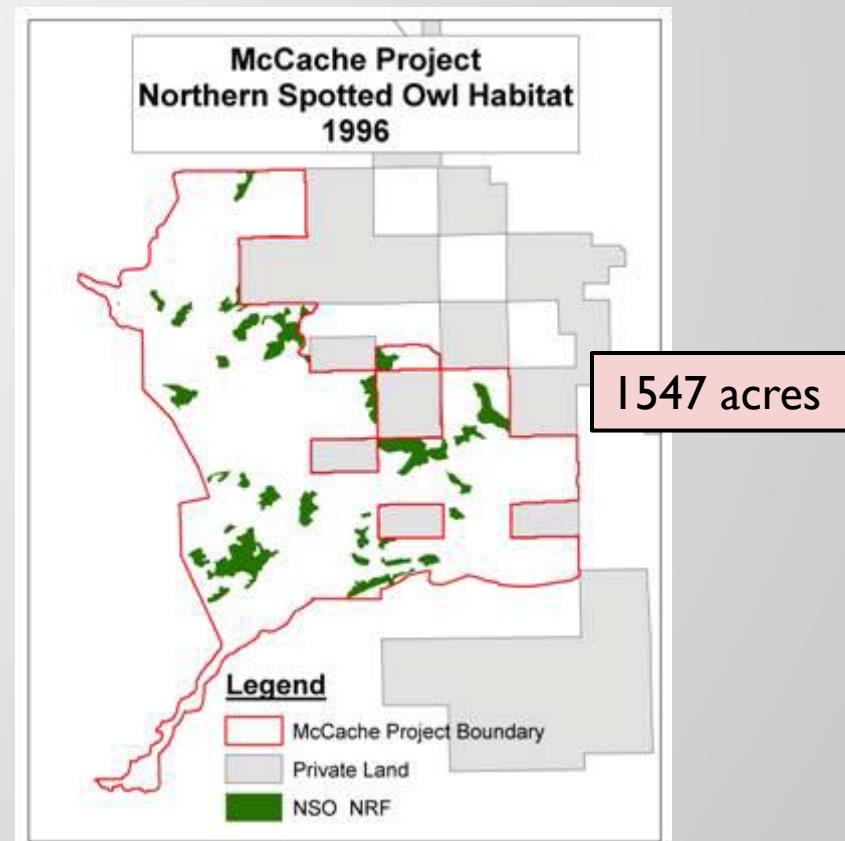


Deschutes NF: 72% loss habitat due to insect & disease in McCache Project Area

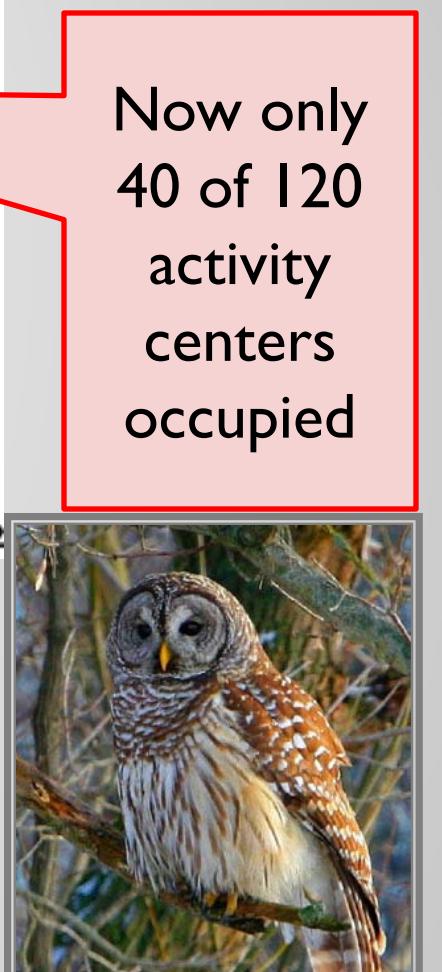
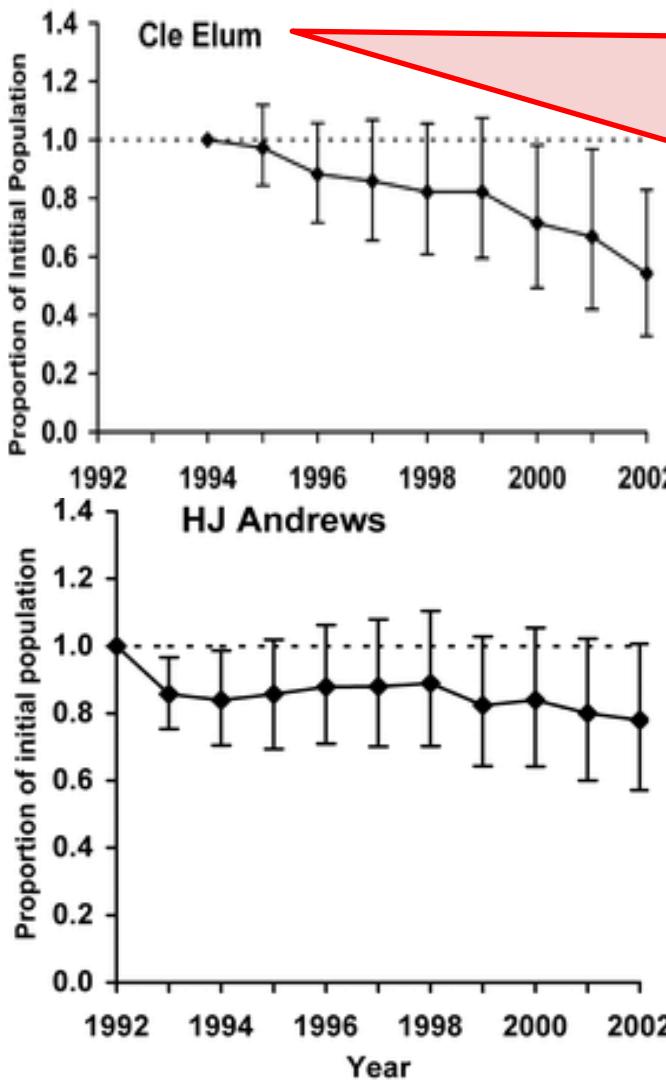
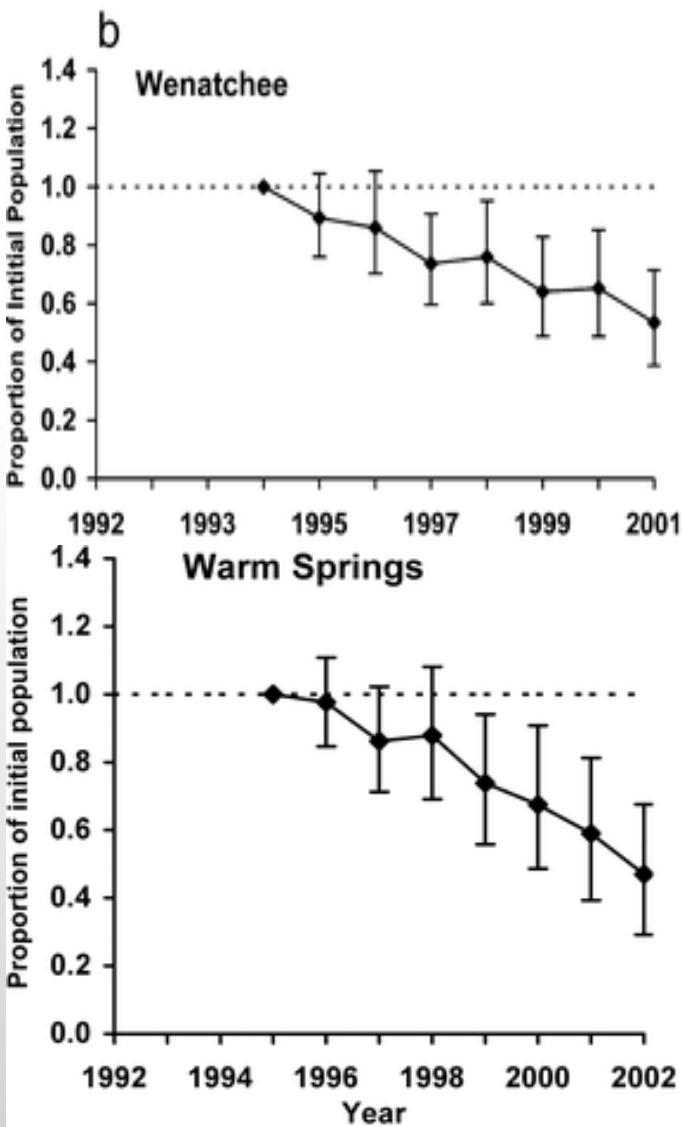
1985



1996



Spotted owl demographic trends...

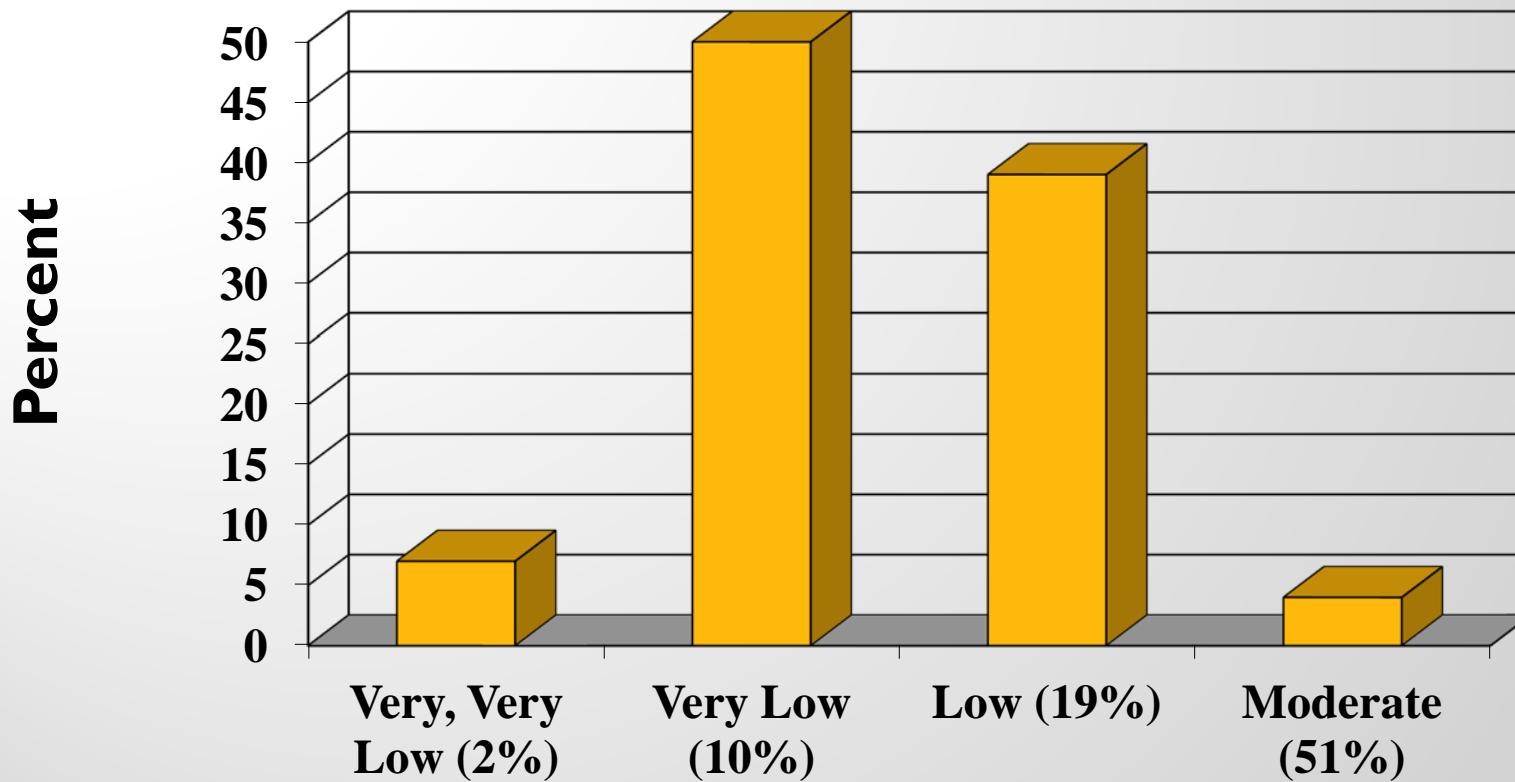


Now only
40 of 120
activity
centers
occupied

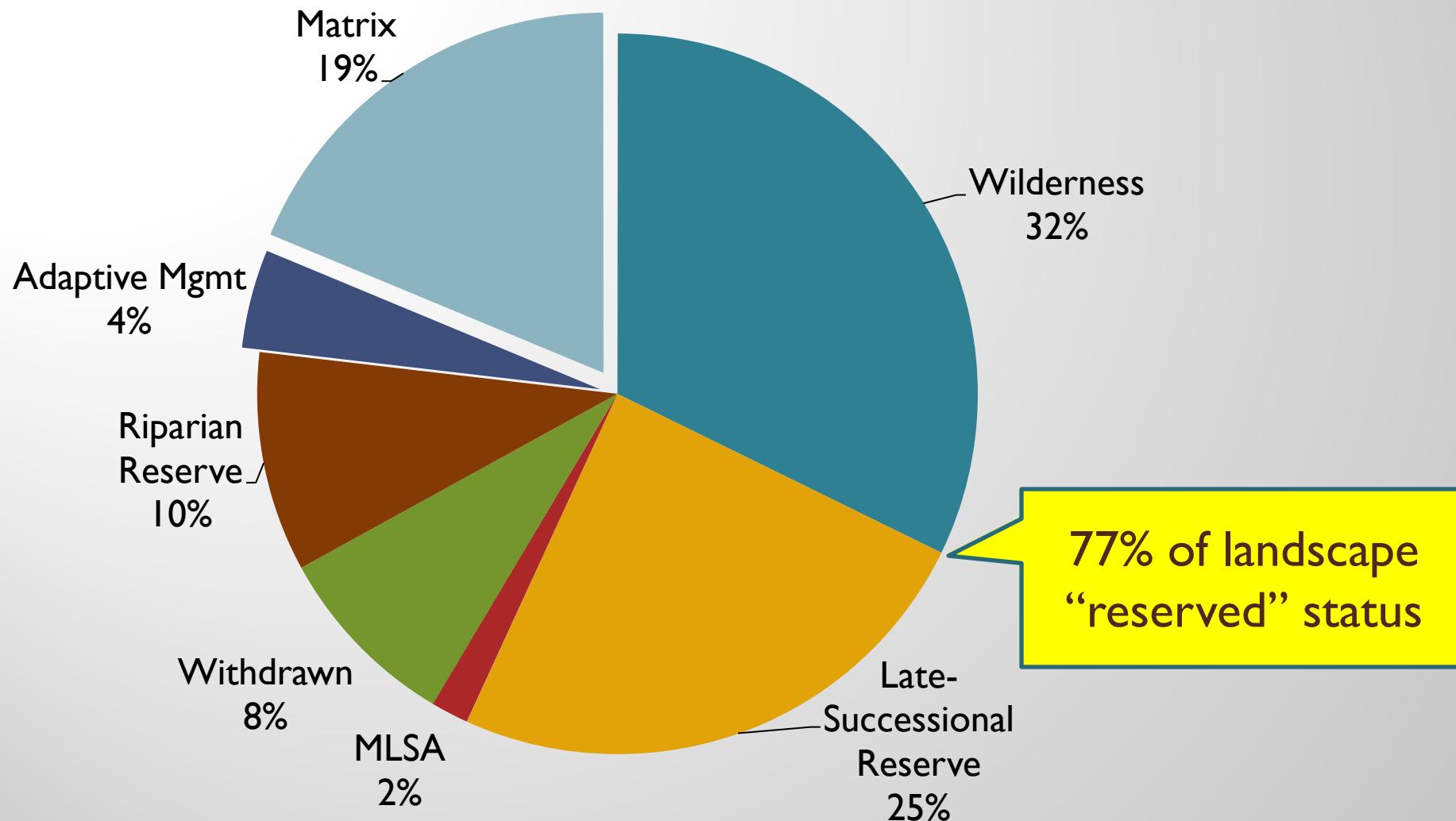
Invasive barred owl
may be cause of
decline

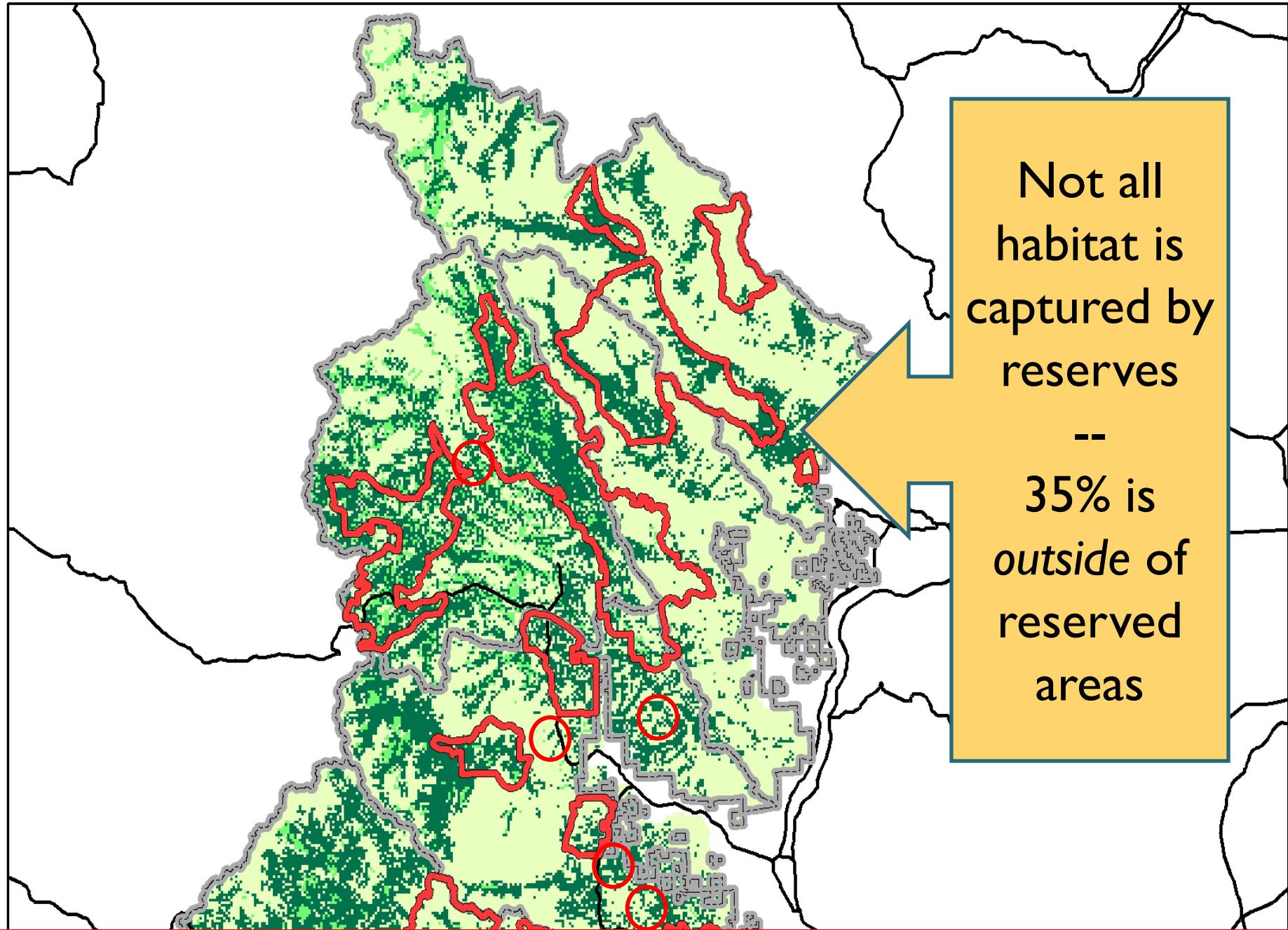
Persistence of Spotted Owl Activity Centers

(applying Camp et al. 1997)



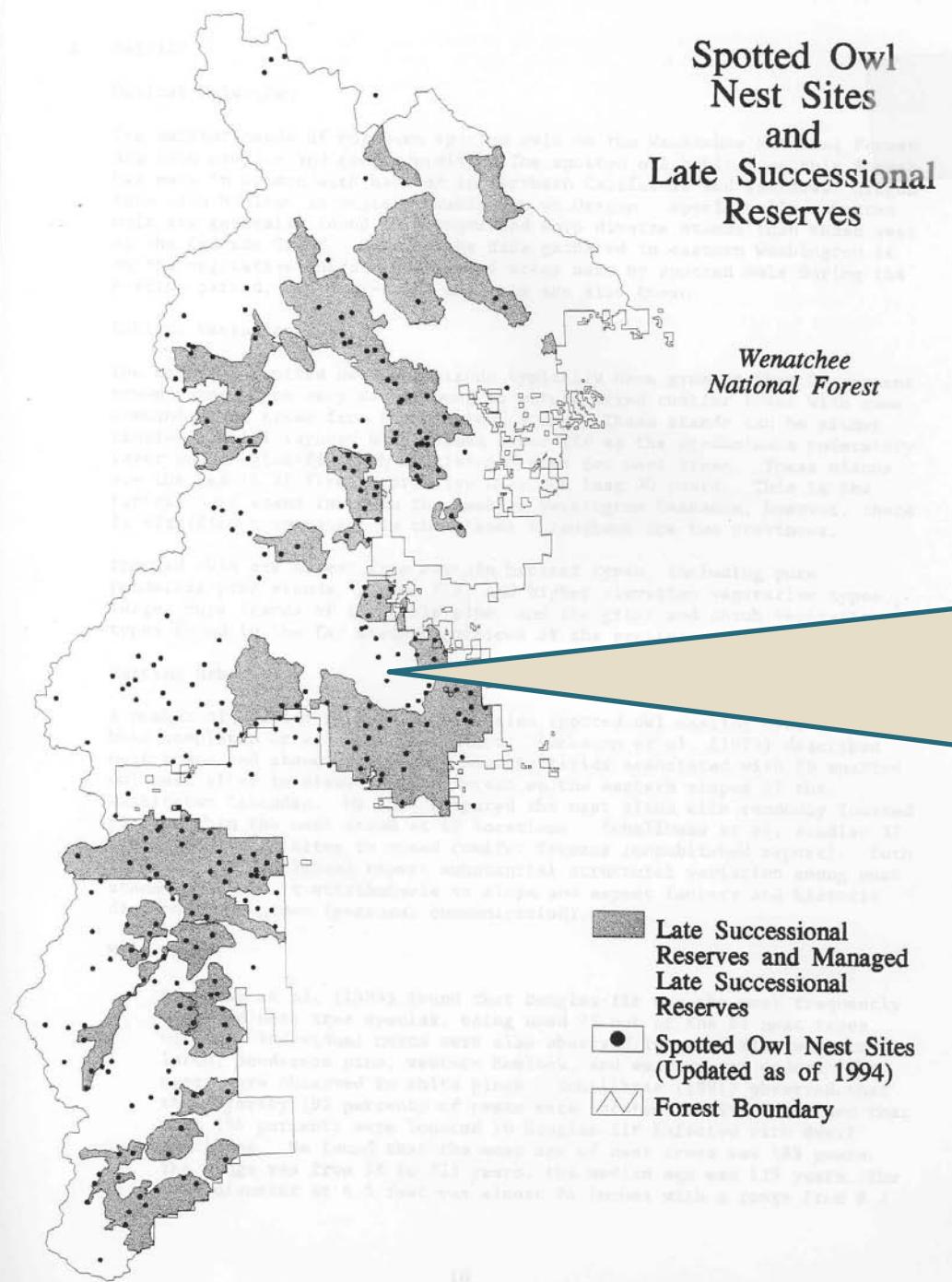
Northwest Forest Plan allocations in the eastern Cascade Range





Not all
habitat is
captured by
reserves

--
35% is
outside of
reserved
areas



Not all historical owl activity centers captured by reserves

—
25% are *outside* reserved areas

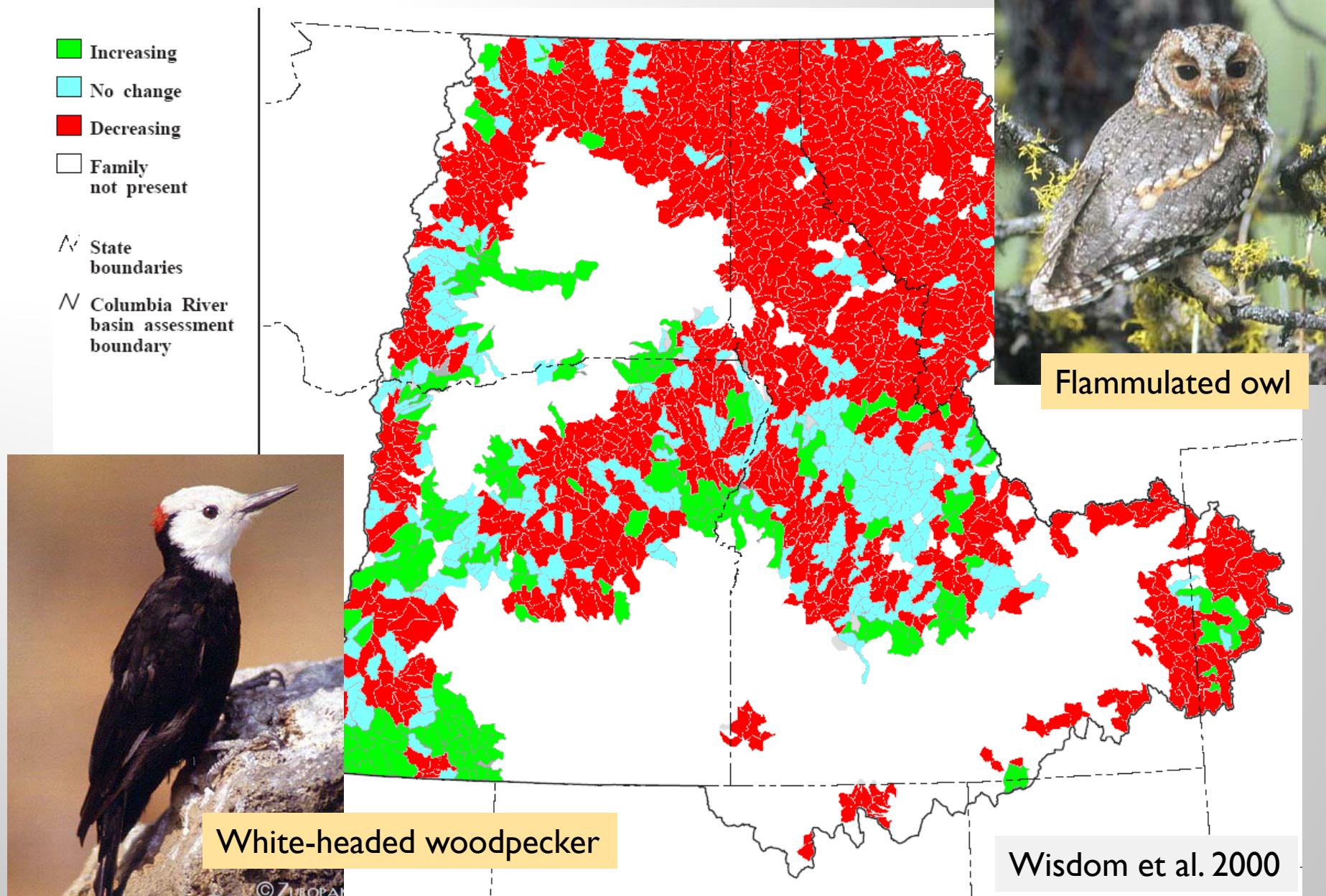


Pinus ponderosa forest

Pseudotsuga-Abies
mixed-conifer forest



Trends in low-elevation, open pine spp.



U.S. Fish & Wildlife Service

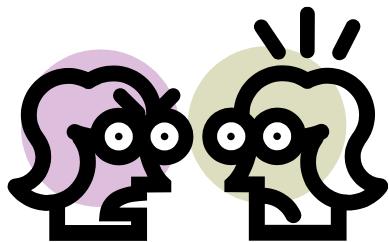
Revised Recovery Plan

for the Northern Spotted Owl

(*Strix occidentalis caurina*):

The Strategy: Manage whole landscapes for owl recovery in context of ecosystem restoration





We don't know enough
to make this plan succeed!

Wrong, we have 20 years of
basic & applied research &
management experience!



Will it work? Successful whole-landscape plans for forest raptors...

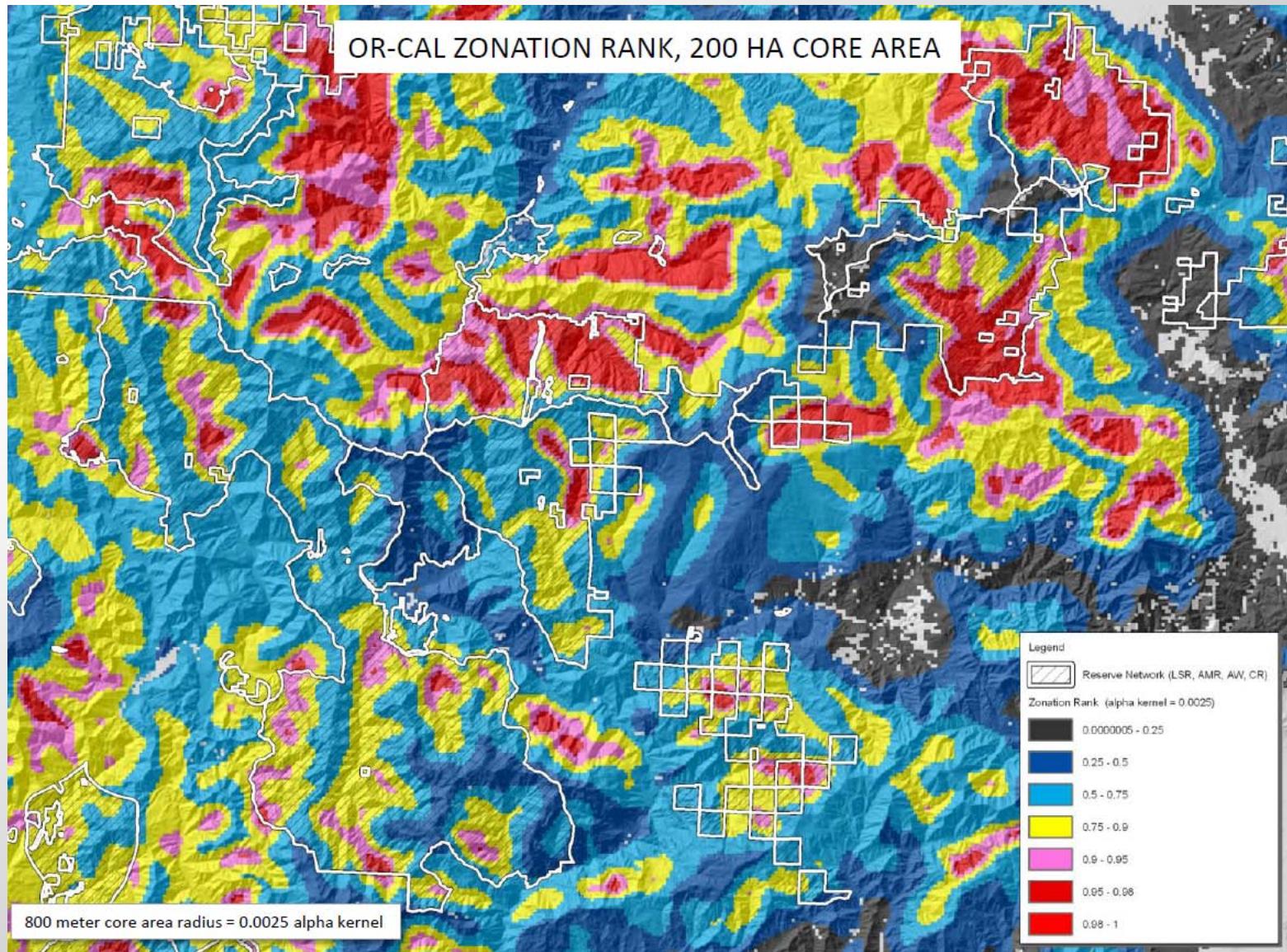
**Management Recommendations
for the Northern Goshawk
(*Accipiter gentilis*) in the
Southwestern United States.**

(Reynolds et al. 1992)



**Recovery Plan for the Mexican Spotted
Owl (*Strix occidentalis lucida*).
(US Fish and Wildlife Service, 1995)**

Landscape-silviculture...



Stand-scale silviculture

4

Trees per ha.	90% CL
Small - 122	± 132
Medium - 42	± 24
Large - 14	± 4



5

Trees per ha.	90% CL
Small - 436	± 75
Medium - 85	± 17
Large - 16	± 3



3

Trees per ha.	90% CL
Small - 276	± 62
Medium - 101	± 13
Large - 7	± 1



7

Trees per ha.	90% CL
Small - 45	± 36
Medium - 65	± 17
Large - 22	± 9



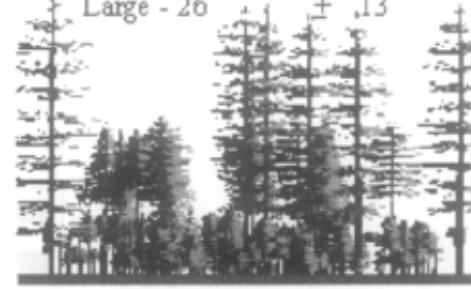
8

Trees per ha.	90% CL
Small - 165	± 23
Medium - 71	± 5
Large - 22	± 2



9

Trees per ha.	90% CL
Small - 748	± 265
Medium - 53	± 31
Large - 26	± 13



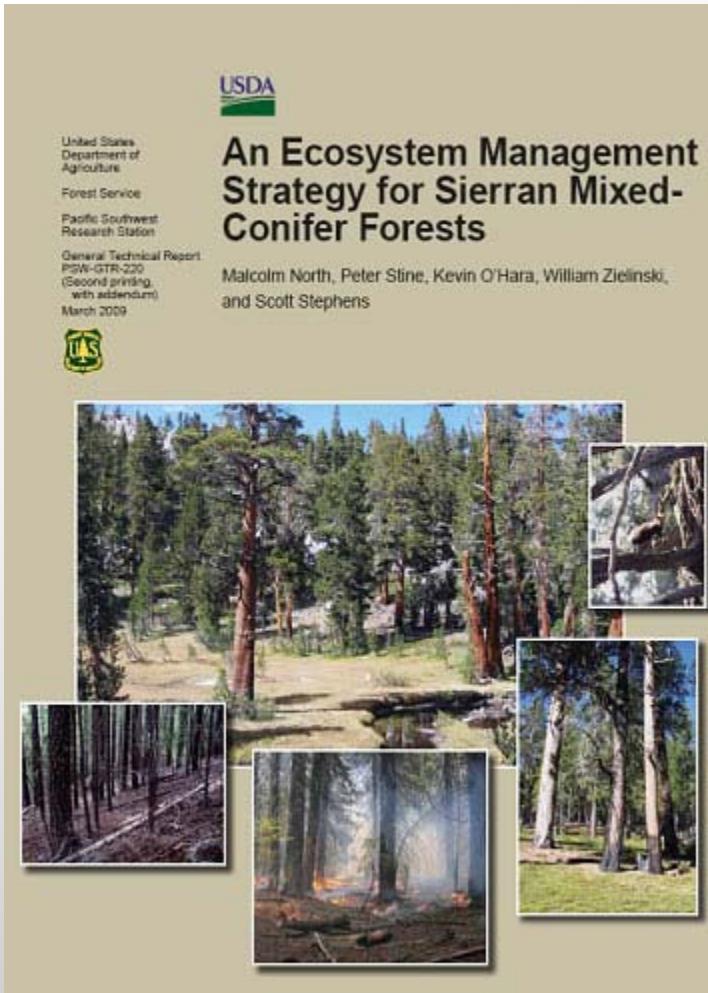


Pinus ponderosa forest

Pseudotsuga-Abies
mixed-conifer forest



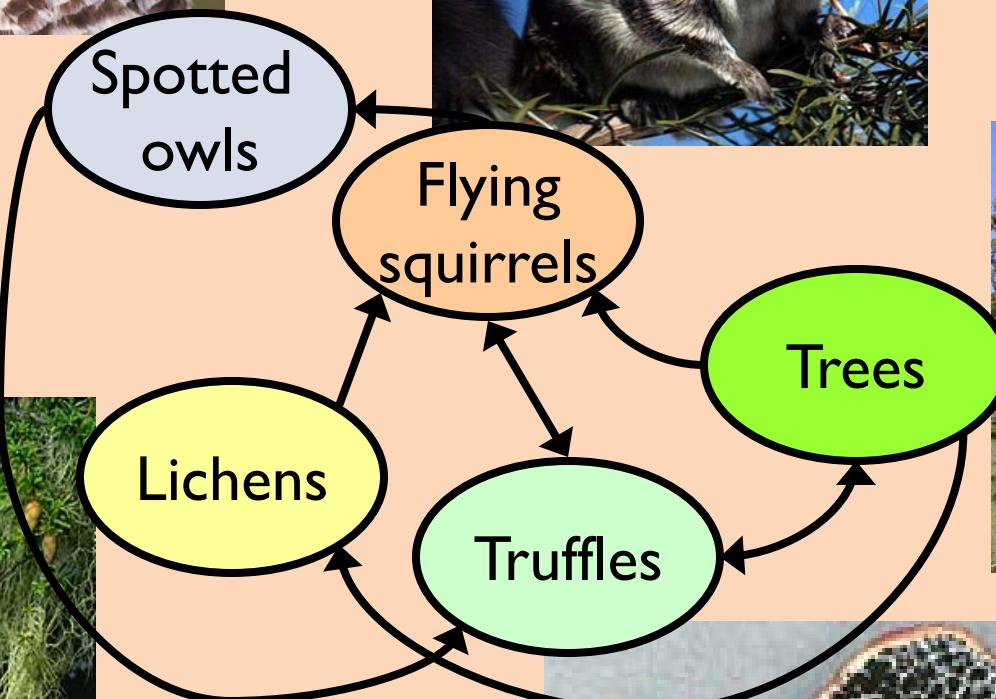
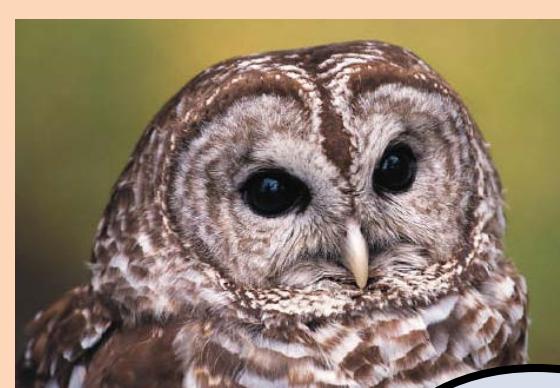
Mixed-conifer management – the ecology & management of mixed-fire severity regimes...



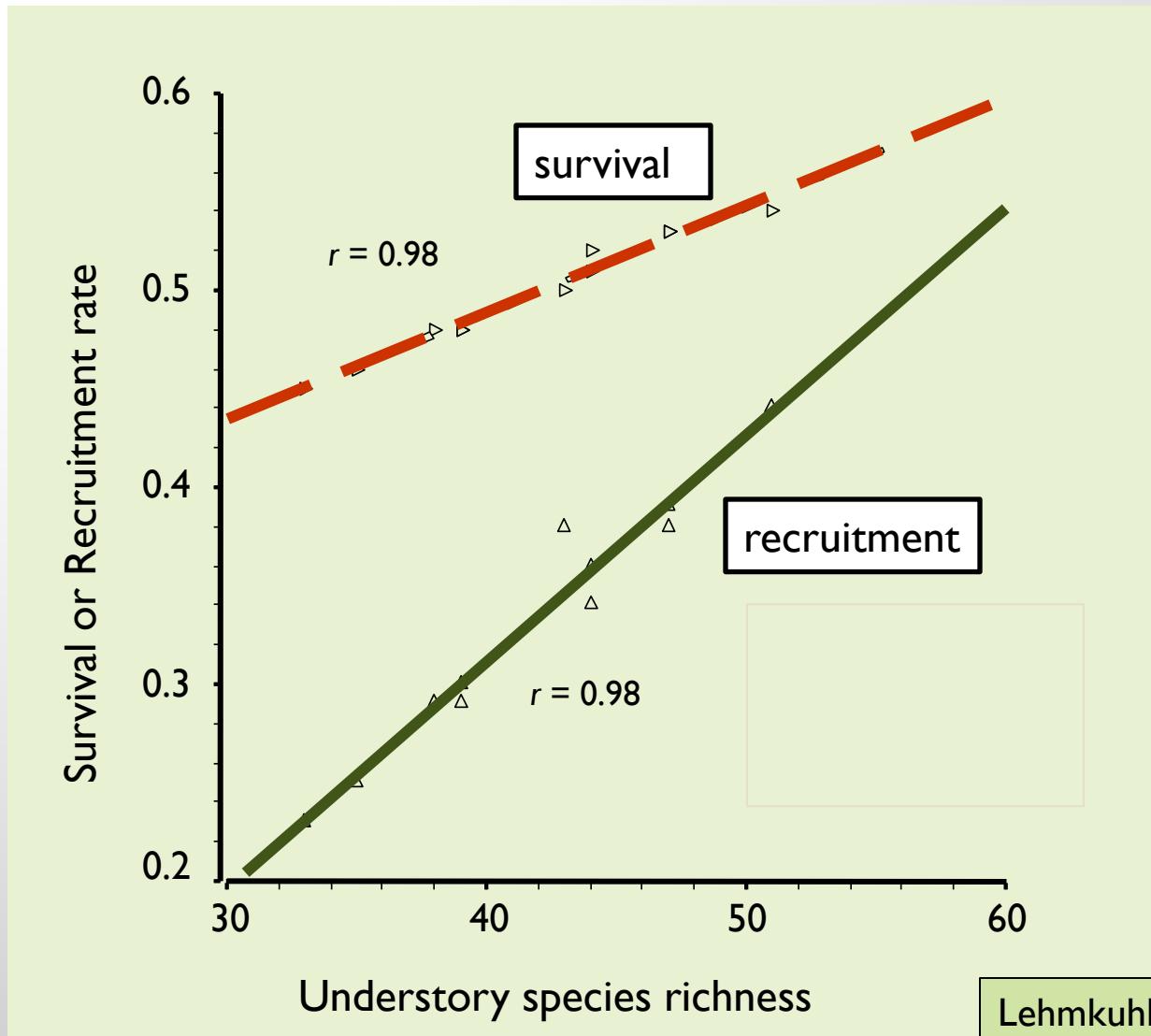
Wildlife/ecological elements to maintain & restore.....

- Heterogeneity: skips & gaps, clustering, etc.
 - Canopy & understory diversity, esp. shrubs.
 - Fire effects.
 - ***Prescribe for variability, not averages.***
- Large live & dead trees. More large trees in diameter distribution – not classic reverse-J distribution.
- Defective trees...pattern & process!
 - Insects & disease
 - Mistletoe
- Large logs, woody debris.

Manage for “Ecological Webs”



Understory diversity: flying squirrel fitness increases w/ richness of plant understories...



Lehmkuhl et al. 2006

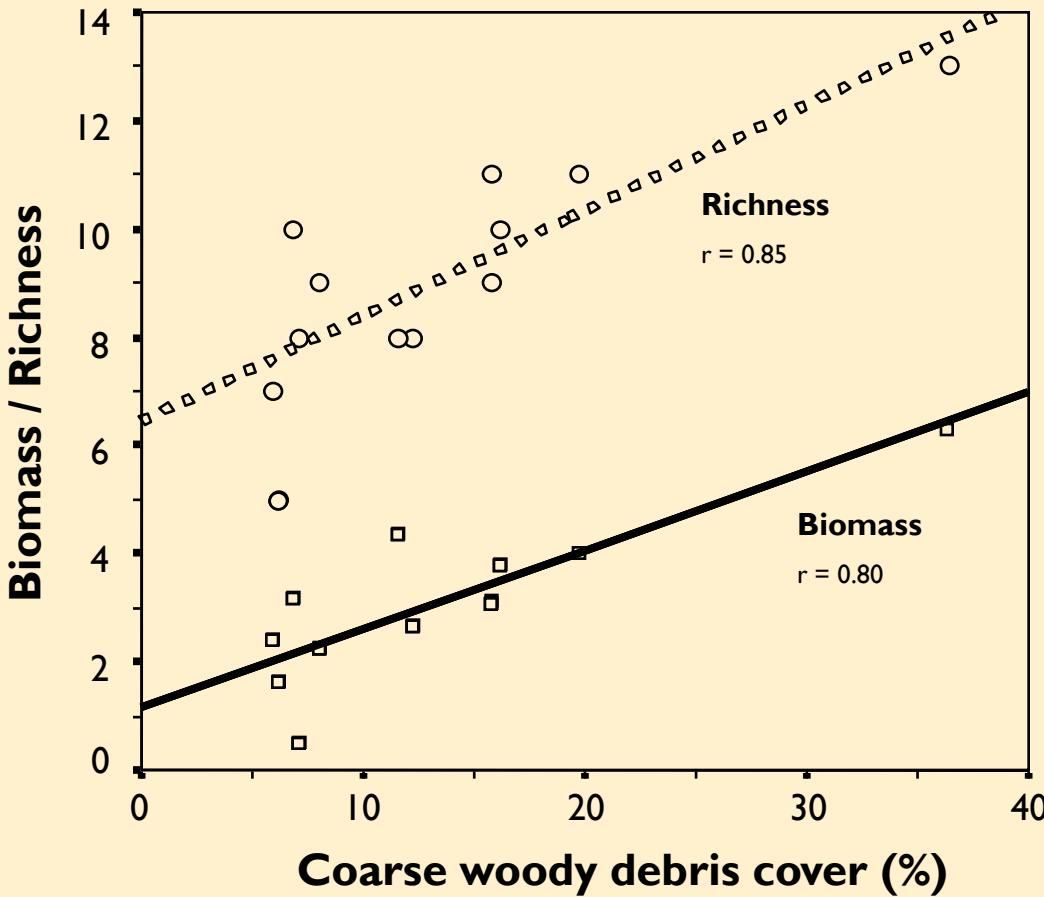
Patchy veg pattern supports other important spotted owl prey....

- *Snowshoe hares* (~10% NSO diet)
 - High understory cover
 - Spatial diversity of shrub & herb patches,
 - Dense thickets of small trees or early-seral vegetation
- *Gophers* (~8% NSO diet)
 - Deep soft soils
 - Abundant herbaceous vegetation esp. forbs



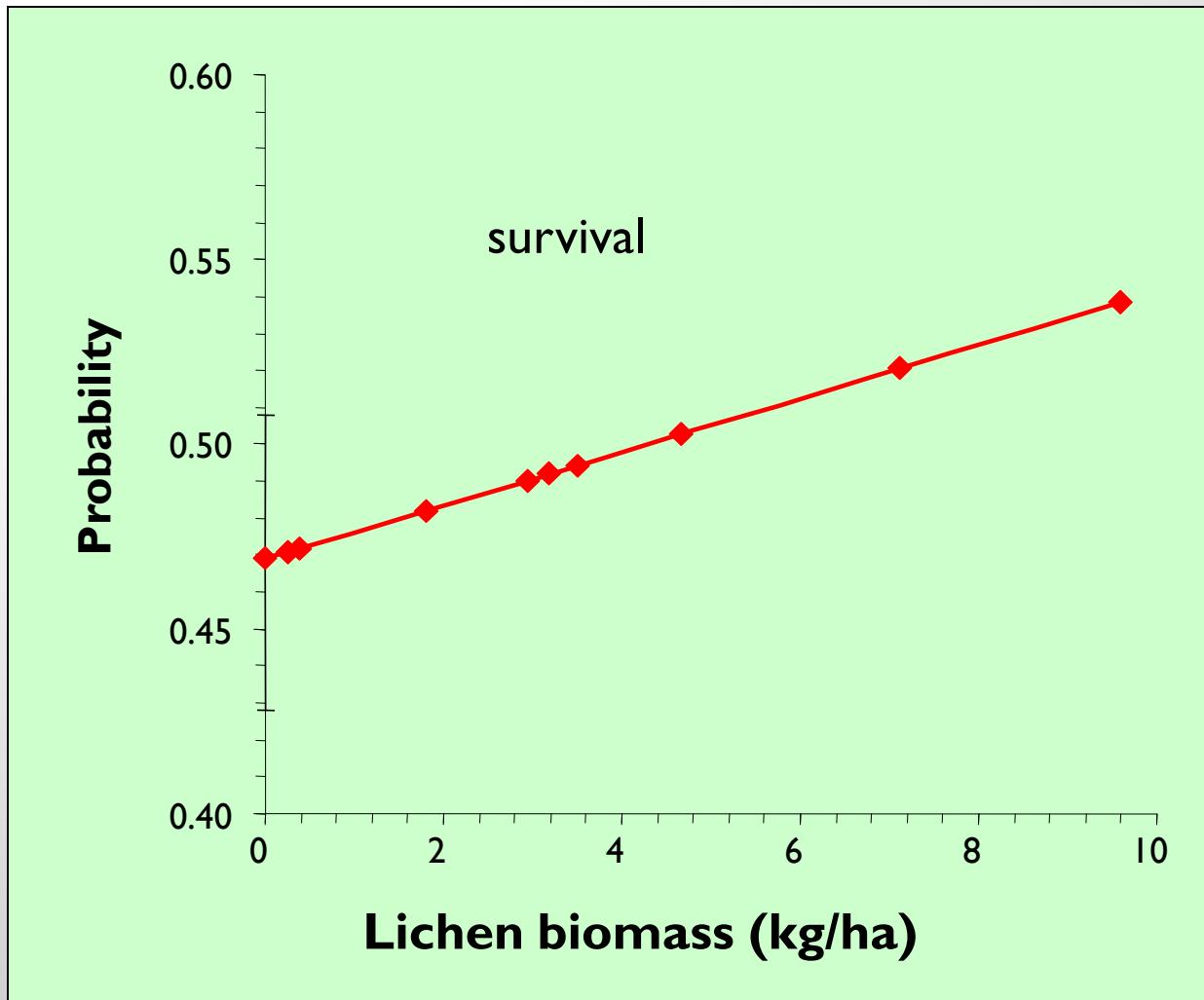
Forsman et al. 2001, 2004

Woody debris: truffle richness & biomass increases with large-log cover...



Lehmkuhl et al. 2004

Large, old trees in patches: flyer survival increases w/ forage lichen biomass...

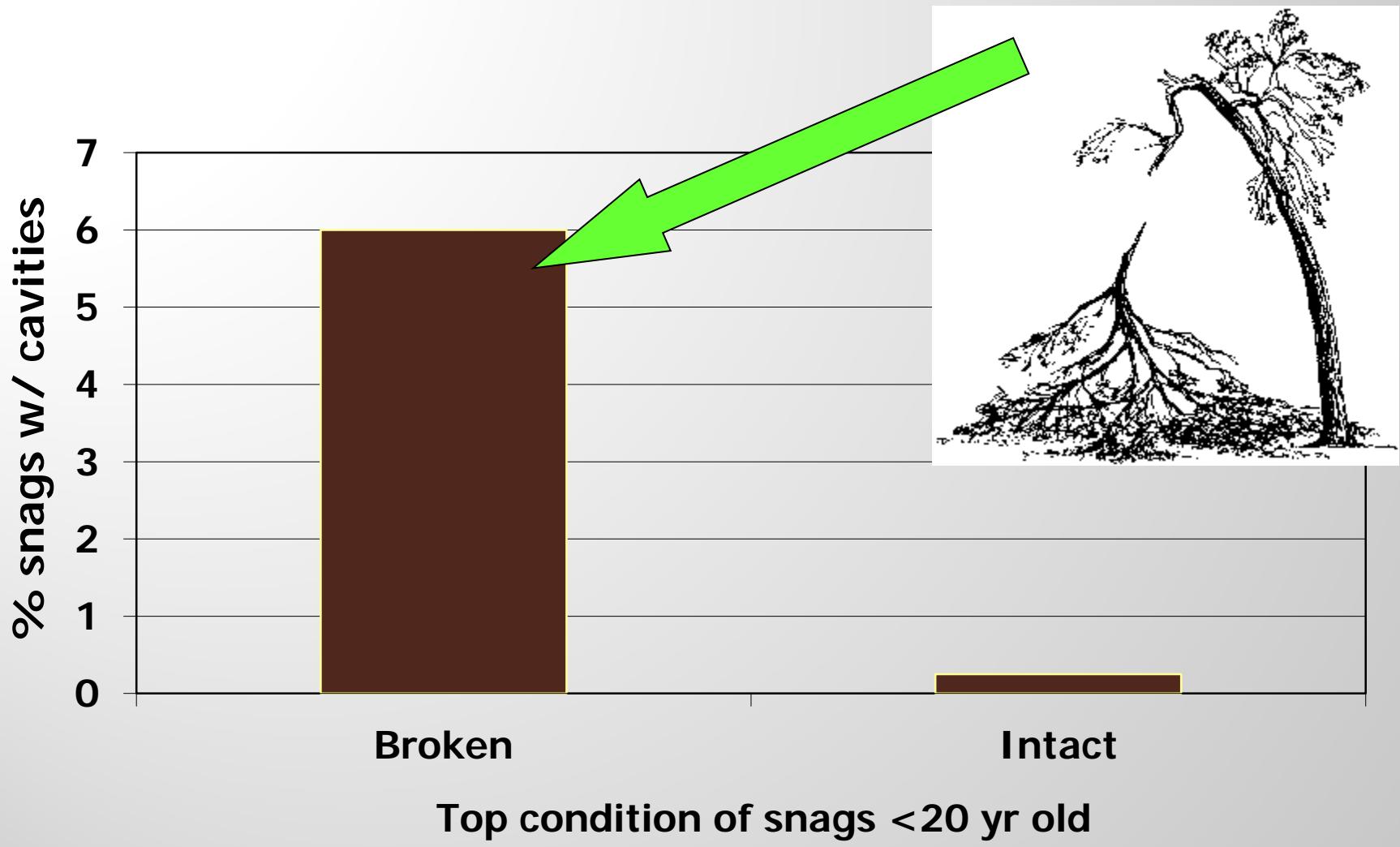


Lehmkuhl 2004
Lehmkuhl et al. 2006

Large defective trees: important nesting, denning sites...



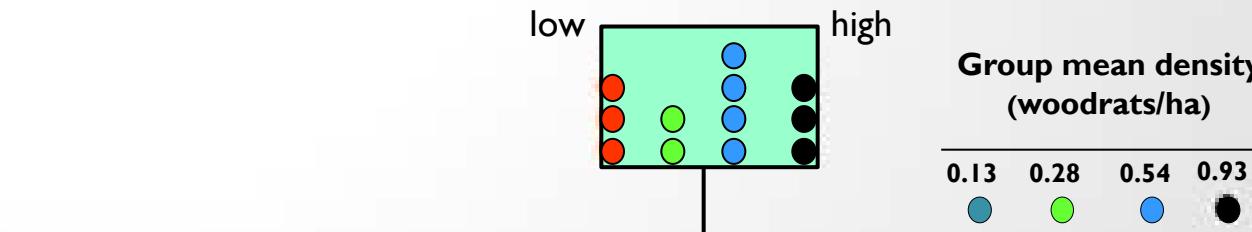
The importance of green-tree defects after fires for cavity nesters.....



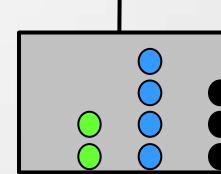
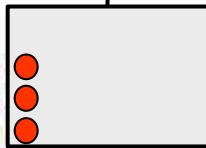
Lehmkuhl et al. 2003

B-t Woodrats: high density where dead wood & mistletoe in all cover types...

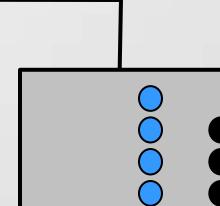
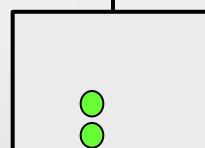
Woodrat density groups



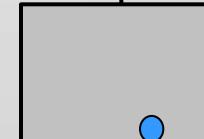
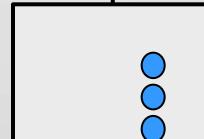
Large snag density <20/ha



Mistletoe index <5.0



Soft log cover <1.3%



Woodrats most abundant where more snags, mistletoe, & logs

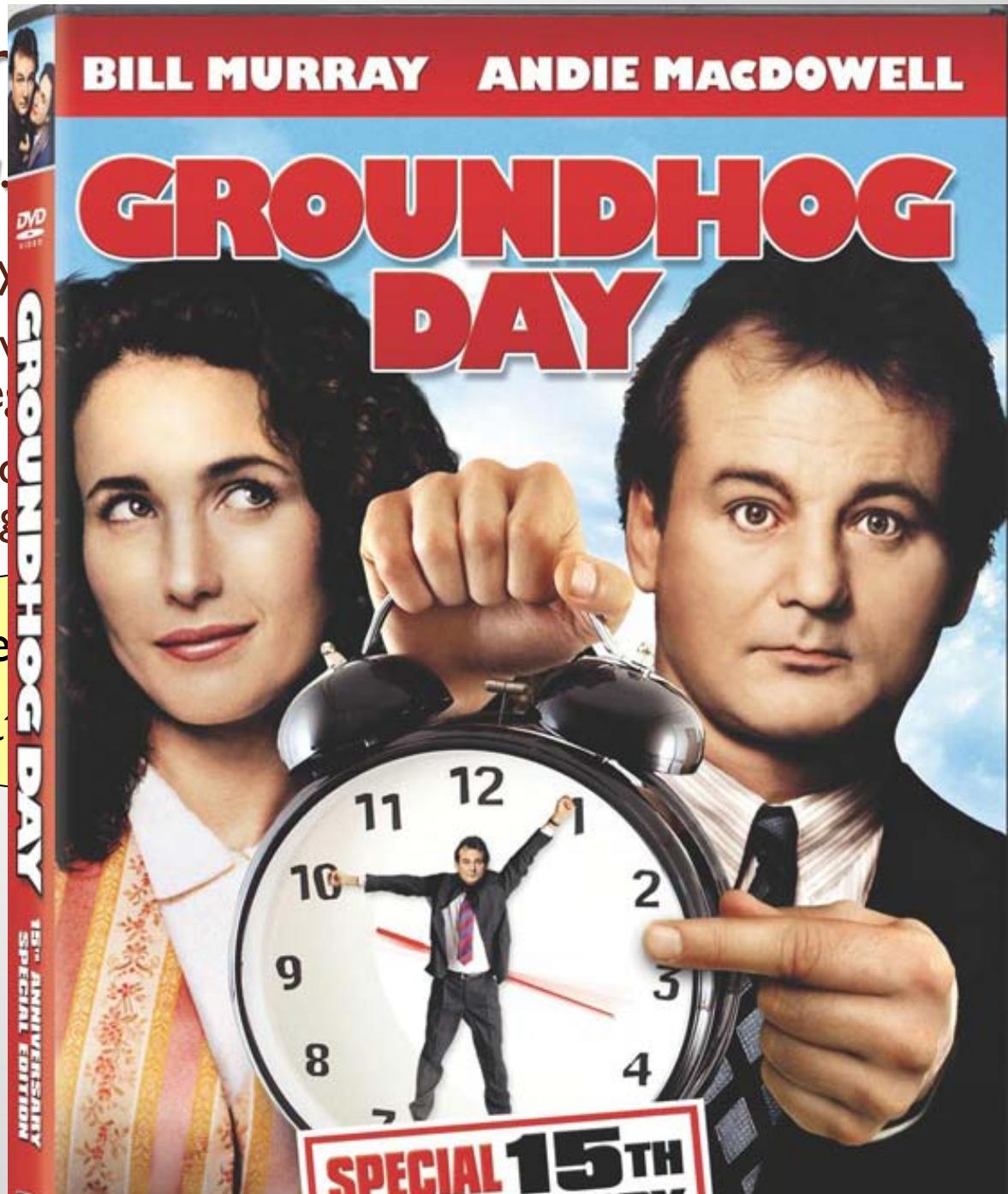
*Develop & test better prescriptions
to meet ecological & social objectives...*



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Fire and Fire Surrogate Study



Forest Science 2010 v.56

Mission Creek





Questions?