

POST-FIRE VEGETATION DYNAMICS

David Hibbs

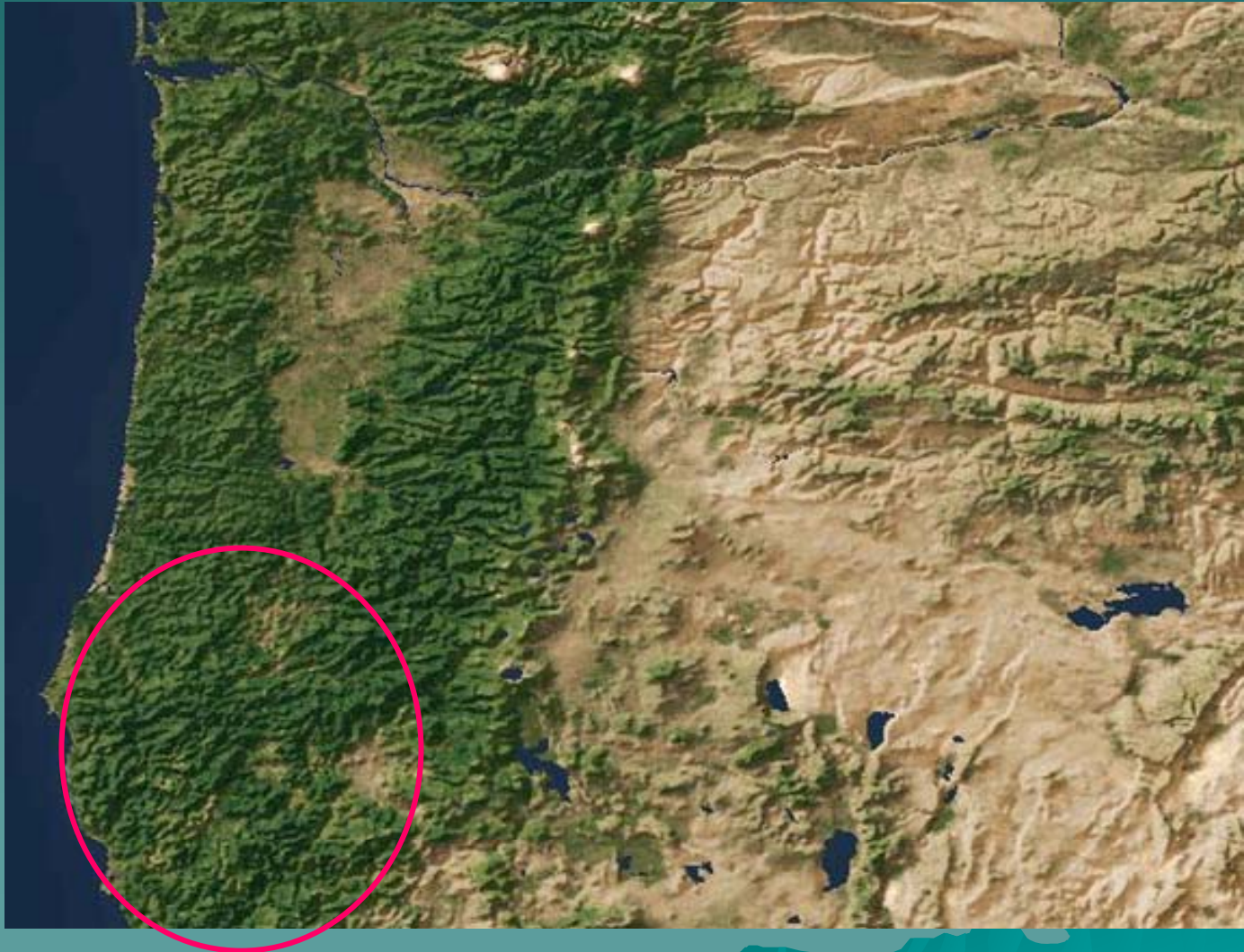


With lots of help from
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Maria Lopez
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Outline

- ◆ Intro
 - the Klamath-Siskiyou region
 - fire in the region
- ◆ Recovery
 - in the first few years
 - after 10 to 20 years
- ◆ On-going work

The Klamath – Siskiyou Region

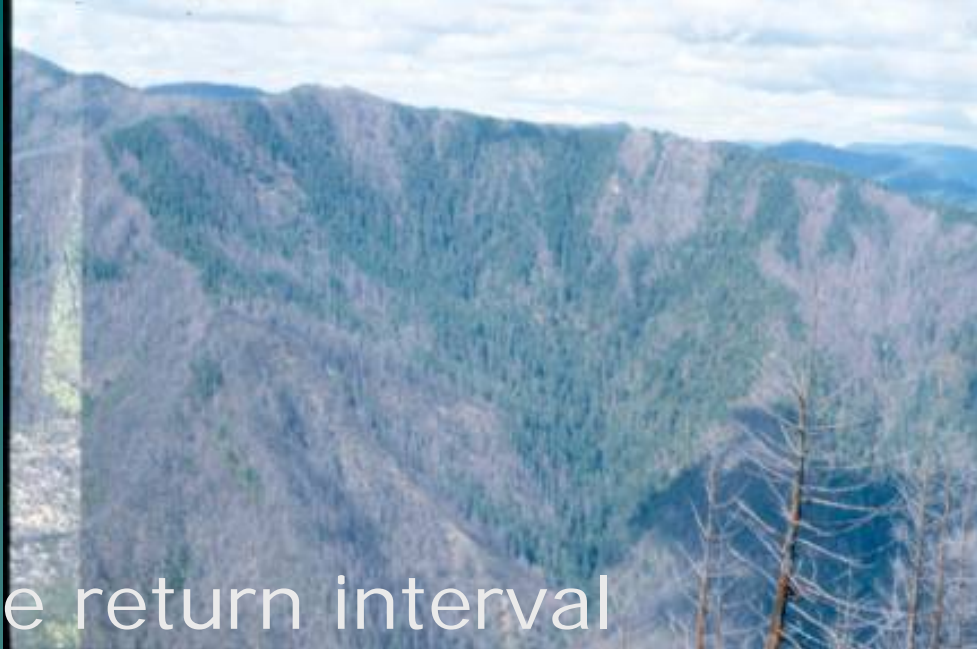




Steep Topography

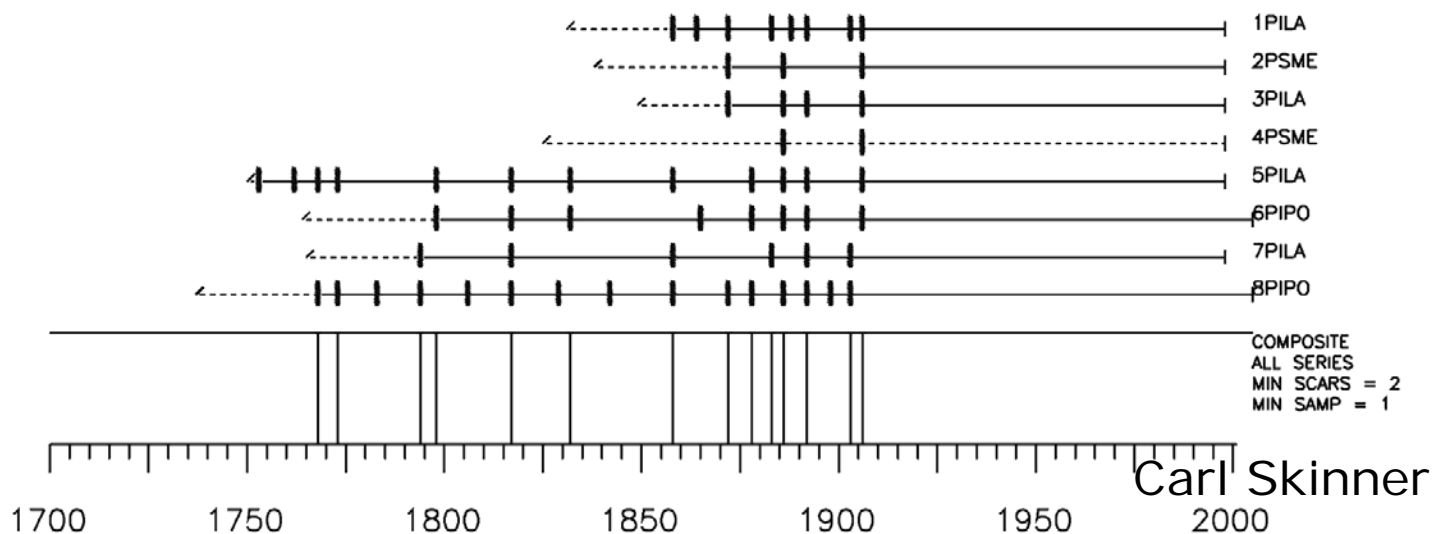
Diverse Vegetation

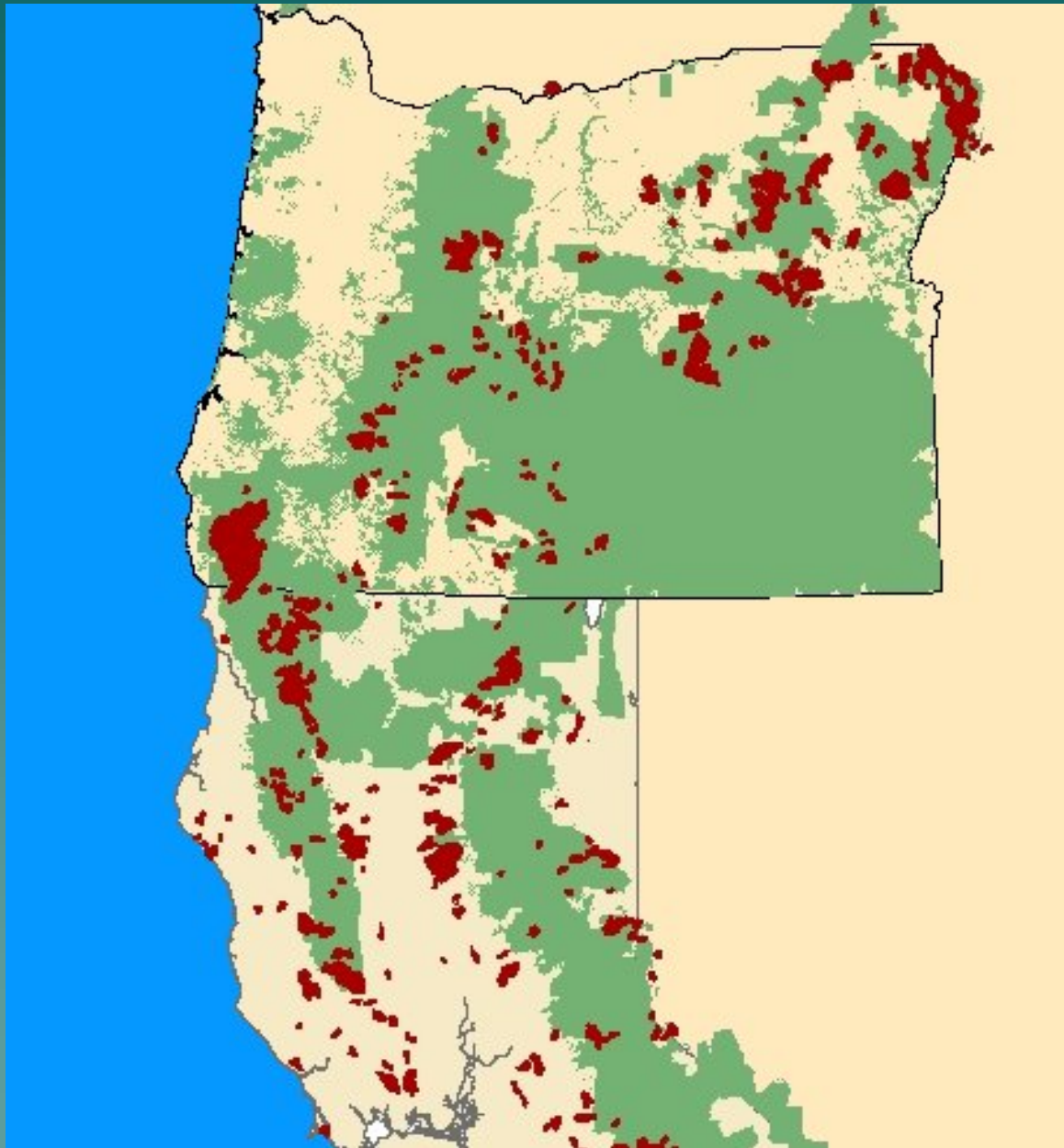




Fire regime

- Historically, a short fire return interval
- Fire suppression effective about 1900
- Now, a mixed severity regime

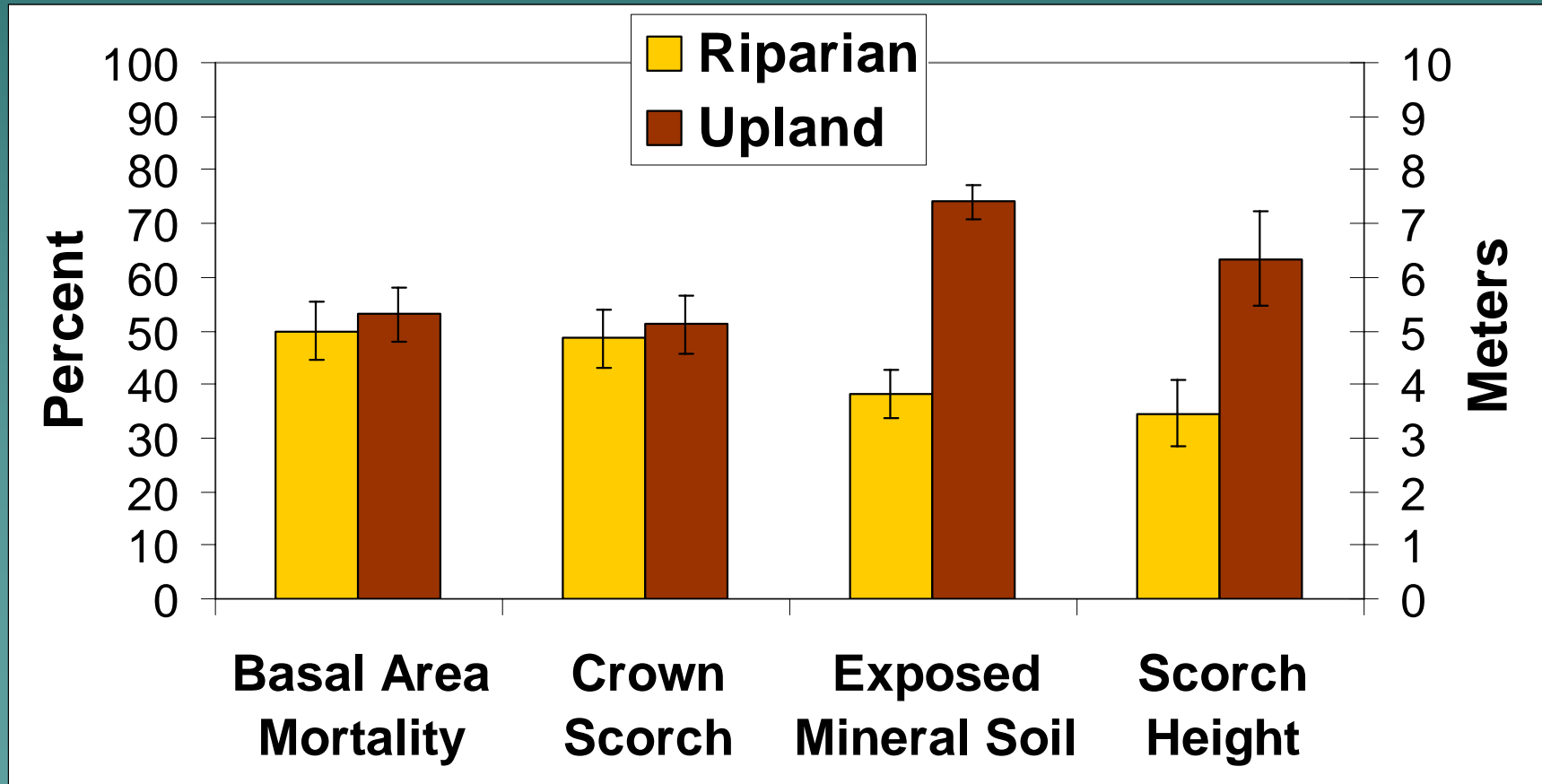




Large wildfires
1970 to 2002
Oregon and
California

Fire in riparian areas

- ◆ Low fire but not high fire is less severe



Fire in riparian areas

- ◆ Adjacency, topography and fuels all contribute to fire severity

Basal area mortality	Exposed mineral soil
Upland fire severity(+)	Upland fire severity (+)
Stem number (+)	Stream gradient (+)
	Hardwood basal area (-)

Riparian

◆ Lots and growing



<u>Species</u>	<u>Avg. % Cover</u>
<i>Acer circinatum</i>	1.0
<i>Gaultheria shallon</i>	5.0
<i>Holodiscus discolor</i>	0.6
<i>Leucothoe davisiae</i>	0.5
<i>Mahonia nervosa</i>	1.2
<i>Quercus sadleriana</i>	0.5
<i>Rhododendron macrophyllum</i>	0.5
<i>Rhododendron occidentale</i>	0.4
<i>Ribes bracteosum</i>	0.4
<i>Rosa gymnocarpa</i>	0.6
<i>Rubus leucodermis</i>	0.4
<i>Rubus parviflorus</i>	0.9
<i>Rubus ursinus</i>	2.2
<i>Vaccinium ovatum</i>	0.4
<i>Vaccinium parvifolium</i>	0.6
<i>Herbaceous spp.</i>	31.7
Total	46.8

Riparian

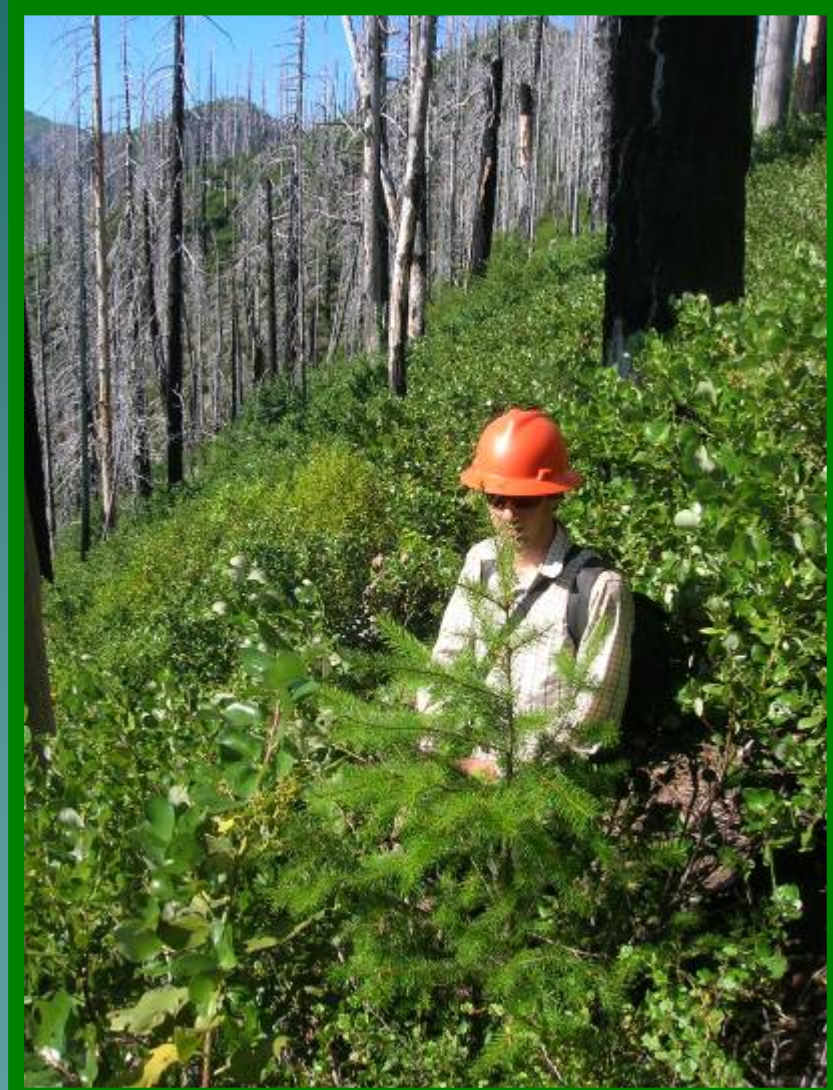
◆ Lots



<u>Species</u>	<u># per ha</u>
<i>Acer macrophyllum</i>	40
<i>Alnus rubra</i>	769
<i>Arbutus menziesii</i>	83
<i>Chrysolepis chrysophylla</i>	80
<i>Cornus nuttallii</i>	203
<i>Lithocarpus densiflorus</i>	777
<i>Quercus chrysolepis</i>	40
<i>Salix spp.</i>	129
<i>Umbellularia californica</i>	29
<i>Abies concolor</i>	23
<i>Chamaecyparis lawsoniana</i>	123
<i>Pinus lambertiana</i>	6
<i>Pseudotsuga menziesii</i>	143
<i>Tsuga heterophylla</i>	11

10 to 20 years Post-fire

- Shrub cover is dense and diverse
- Tree regeneration really is there

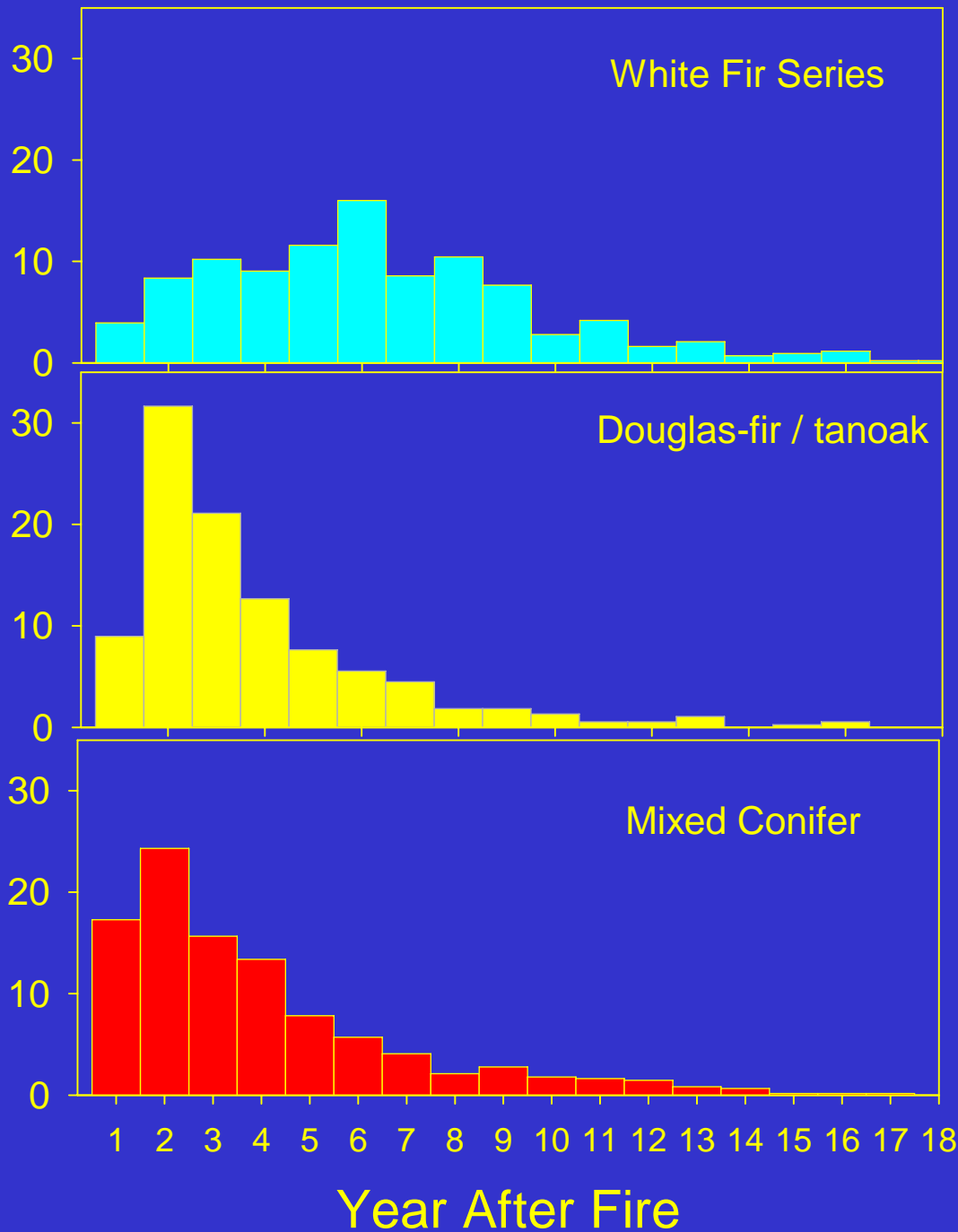


Natural regeneration is abundant

- ◆ Some species effect at dry end of gradient

<u>Forest Type</u>		<u>Conifer regeneration</u>
		Trees / ha
White Fir	n=18	6078
	(±1313)s.e.m.	
Doug/Tanoak	n=20	2448(±603)
Mixed Conifer	n=63	1850(±444)

Relative Frequency



Regeneration
is a gradual
process

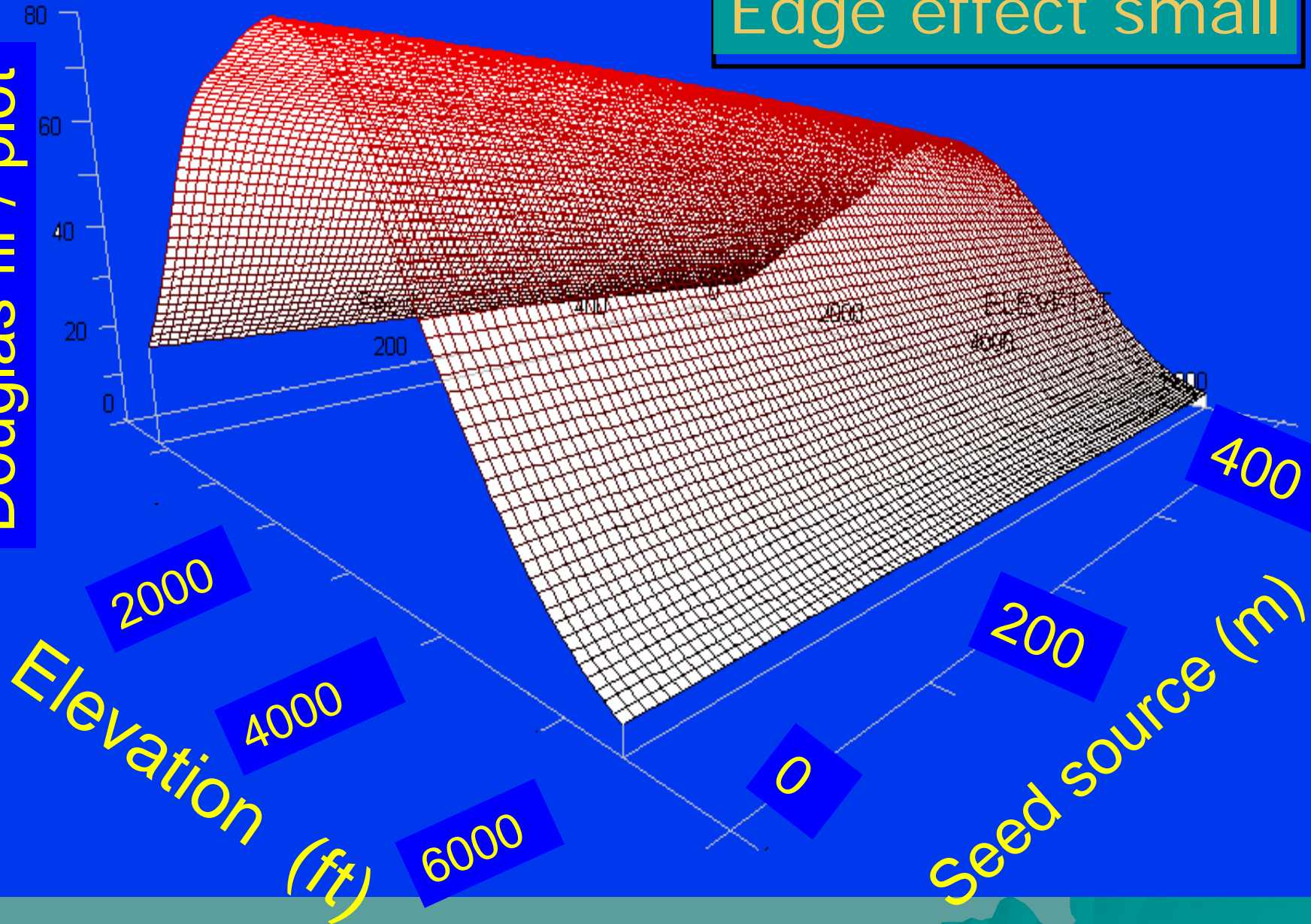
Most conifer regeneration is still within the shrub canopy

- ◆ LCR > 60%
- ◆ Mean height growth > 10 cm/yr



Edge effect small

Douglas-fir / plot

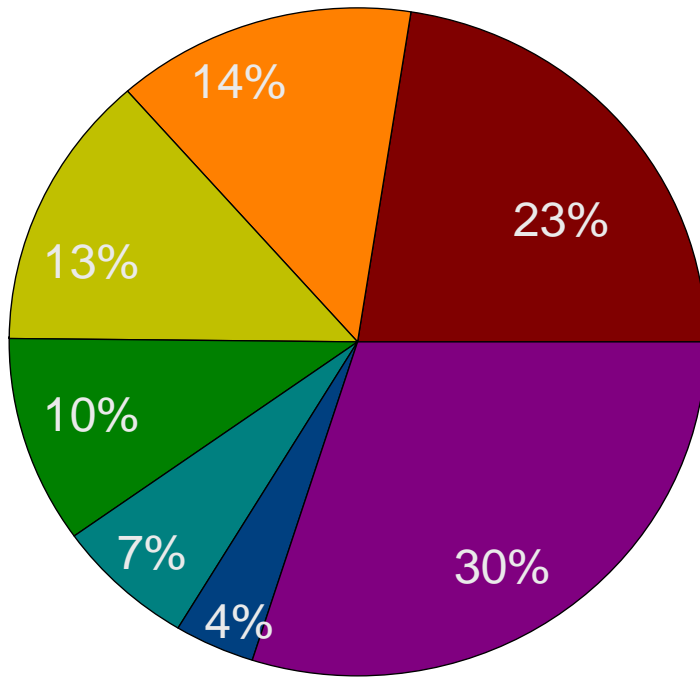


Salvage, burn, plant and cut

- ◆ Dramatic change in shrub community

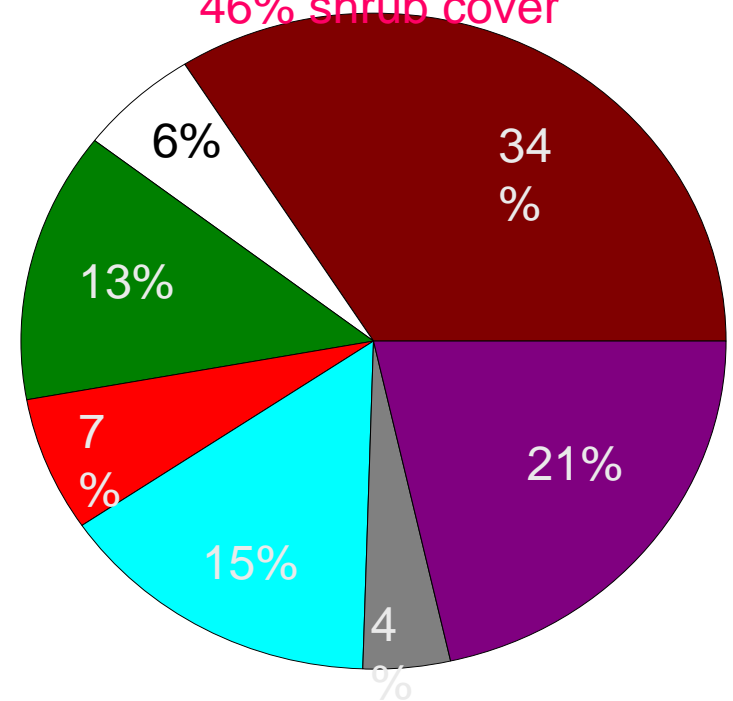
Unmanaged

40% shrub cover



Managed

46% shrub cover



Arctostaphylos viscida

Ceanothus integerrimus

Ceanothus velutinus

Quercus vacciniifolia

Salix scouleriana

Rhus diversiloba

Symphoricarpos mollis

Other spp < 3%

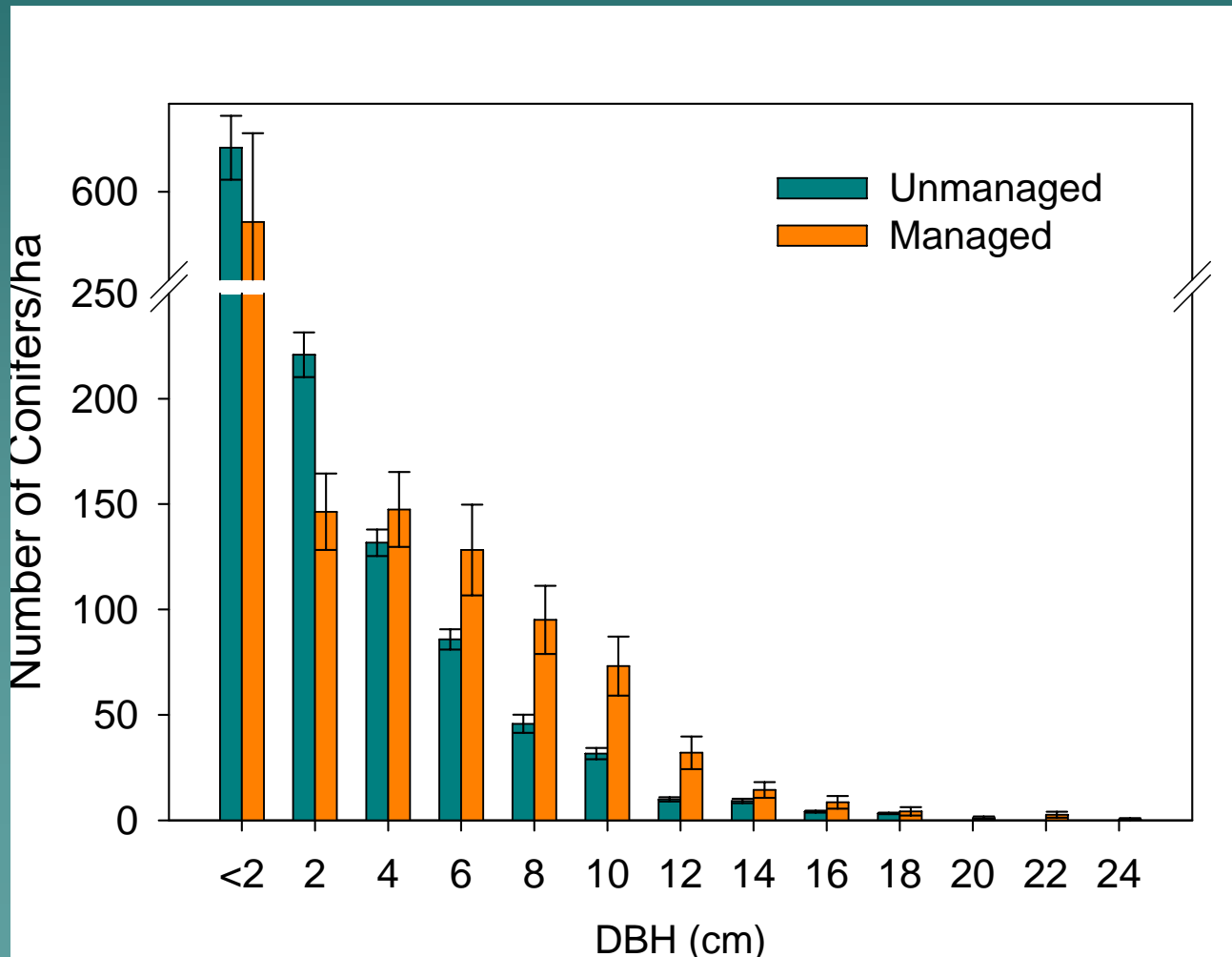
Rubus parviflorus

Berberis nervosa

Corylus cornuta

Salvage, burn, plant and cut

- ◆ More larger trees with management
- ◆ Same total number of trees



Neat conclusions

- ◆ Lots of vegetation comes back very quickly in riparian and uplands
 - Habitat
 - Soil stability
- ◆ Community diversity high
- ◆ Lots of young trees almost everywhere
 - Regeneration is a gradual process
 - Only small effect of seed source distance

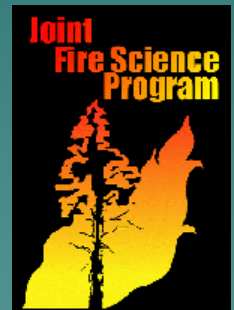
Management does change some community characteristics

- Larger conifer regeneration but significance will vary with objectives
- No snags
- May help with composition and density on drier sites
- Lots more *Ceanothus*
- No change in shrub diversity, cover
- Shortened early successional habitat period?

On-going work

- ◆ Measure role *Ceanothus* plays in post-fire ecosystem N recovery
- ◆ Describe how fire suppression has changed riparian forest vegetation
- ◆ Produce a natural regeneration guide

Credits



USGS Forest and Rangeland
Ecosystem Science Center



College of Agricultural
Sciences and College of Forestry



Fire

Treatments allowed

Treatments not allowed

Options

Natural Regen

Reforestation Option

Natural Regen. Option

Plantation

Site prep for Nat. Regen

How much?
How soon?(when)
Environmental variation (where)

