

Reforestation

Intent

To provide an overview on the objectives and practice of **reforestation** today and big questions that arise in a changed future.

Presenters

Malcolm North – USFS PSW

Jessica Wright – USFS PSW

Joe Sherlock – USFS R5

Marty Gmelin – USFS R5

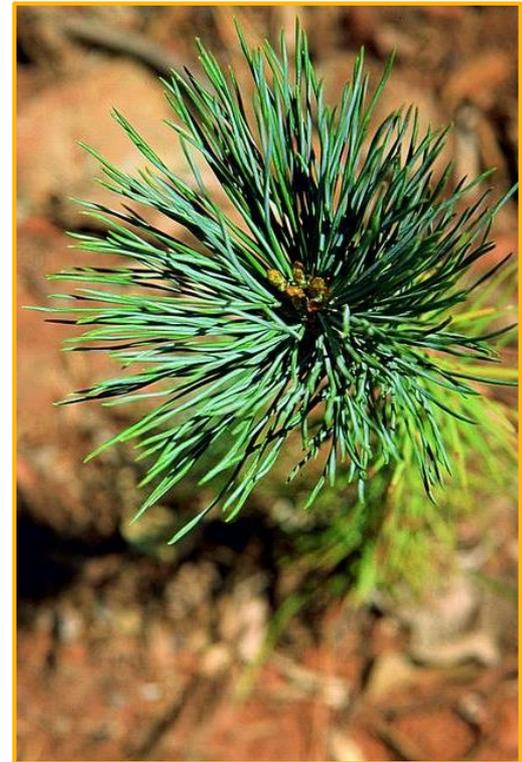
Jodi Axelson – UCCE

Reforestation Through the Lens of Ecology

Dr. Malcom North

Research Ecologist

Pacific Southwest Research Station



Ecological Context

Increasing frequency and severity of **drought** and **wildfire** -

- For increased resilience and resistance:
 - The goal of rapidly growing large trees remains unchanged
 - However spatial arrangement matters
- For better fire resistance, need to manage fuels early and frequently (Rx burn)



40 yr old pine plantation (Plumas NF)



Clumped natural regeneration in an active-fire forest (Yosemite NP)

Ecological Context

Increasing frequency and severity of **drought** and **wildfire**...

- For better drought resilience, need to keep density low and shrub cover separate
- Shrinking budgets = less re-entry/course correction of regeneration plantings
- Experiment with cluster planting in mesic microsites and leave xeric to shrubs?



40 yr old pine plantation (Plumas NF)



Clumped natural regeneration in an active-fire forest (Yosemite NP)

Big Questions

- By topography, what planting density and spatial arrangement foster greater regeneration resilience to drought and fire?
- When and how is prescribed burning best used as a silvicultural tool to increase resilience?
- What cover and distribution of shrubs will provide ecosystem benefits (i.e., habitat, fire heat sink, etc.) without overtaking regenerating trees?



Clump/gap pattern of active-fire forest
(Beaver Creek Pinery)

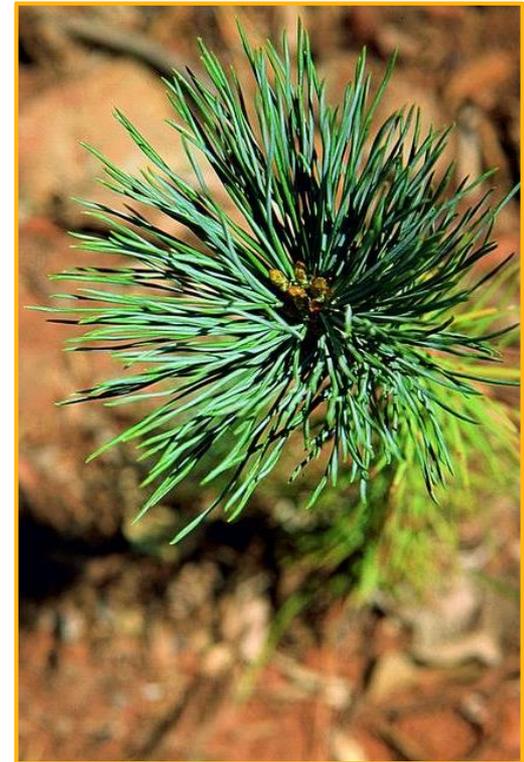


The Role of Genetics in Reforestation

Dr. Jessica Wright

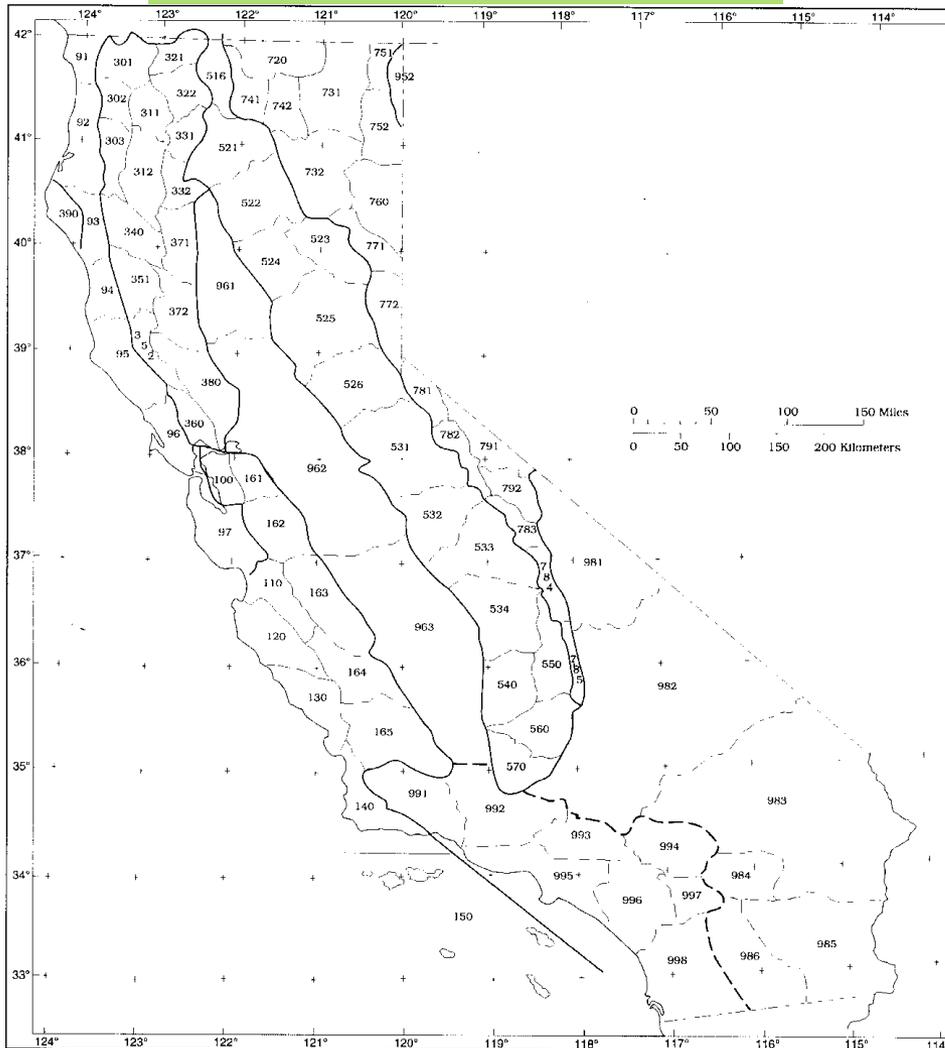
Research Geneticist

Pacific Southwest Research Station



The Present

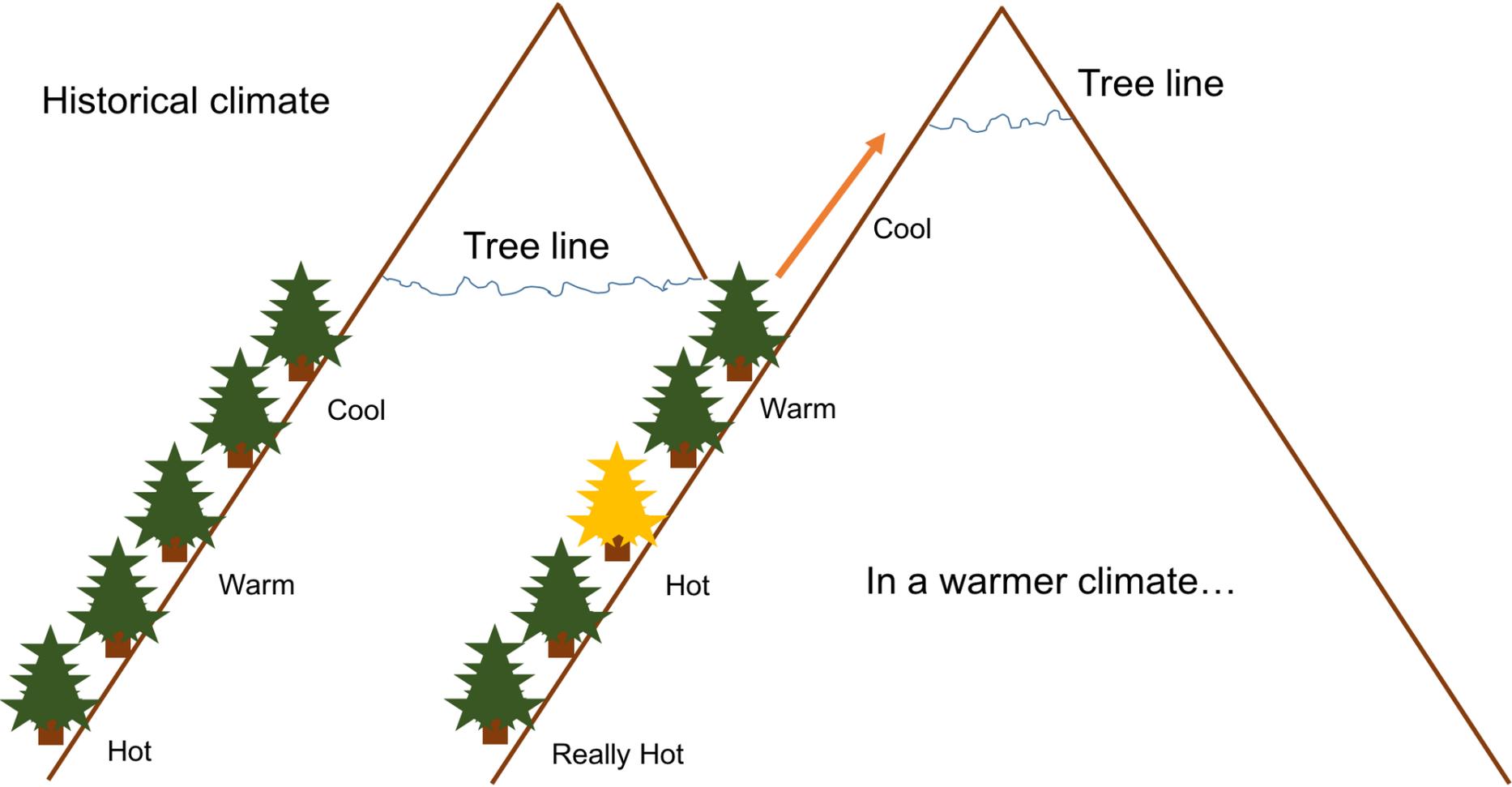
California Seed Zone Map



Forest Service reforestation projects currently utilize **Seed Zones:**

- Pine seeds are moved safely within a 500 foot elevation band within each seed zone
- Determine cone collecting needs for the Region
- Need a good representation from each seed zone and elevation band in the seed bank

The Future



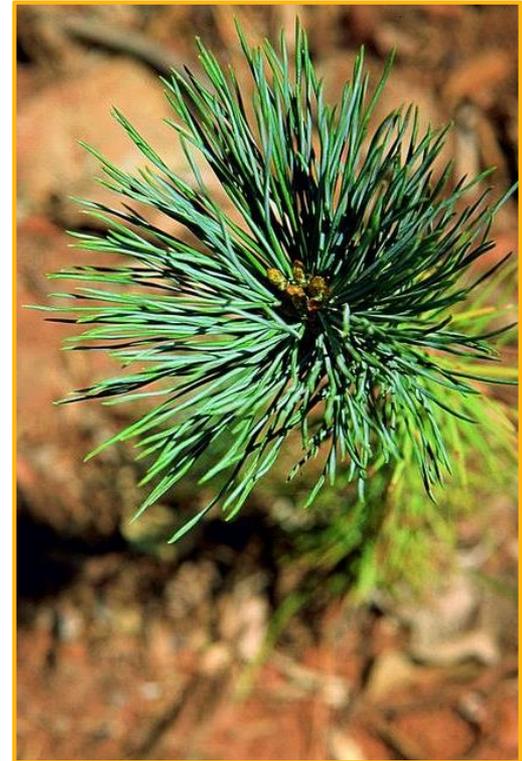
Big Question

Will the California Seed Zone
map work in a changing
climate?

Operational Needs for Successful Reforestation

Joe Sherlock

Regional Silviculturist
USFS Region 5



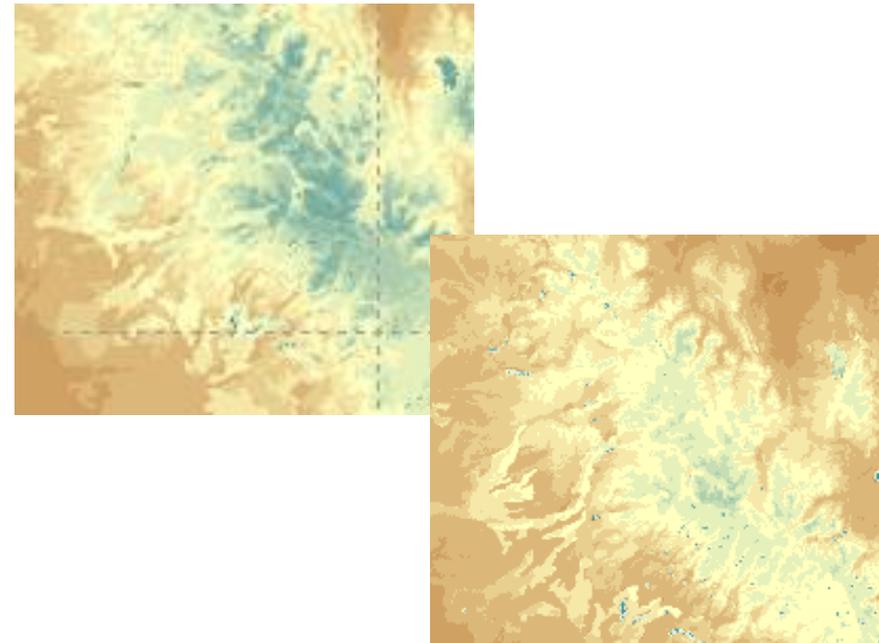
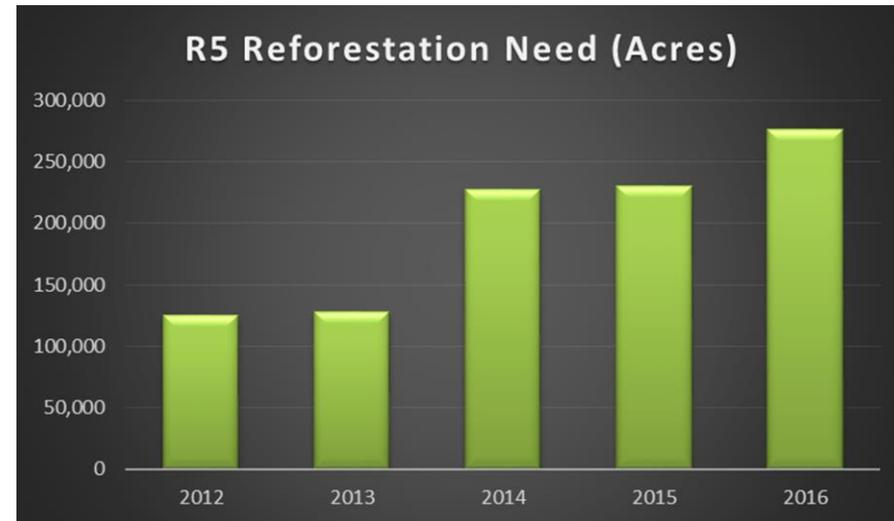
The Problem

Overwhelming numbers

- Reporting to Congress
- Funding gap
- Strategy

The **first priorities**:

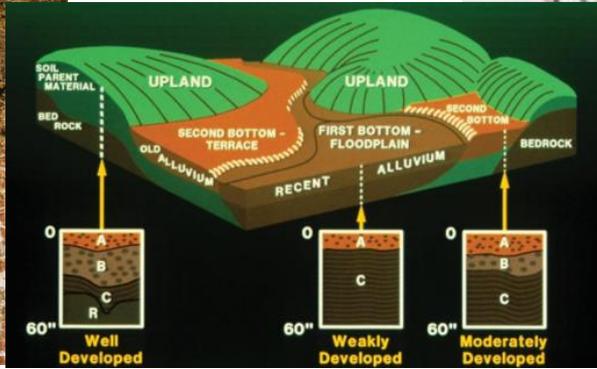
- Desired forests
- Crystal ball
- Hope



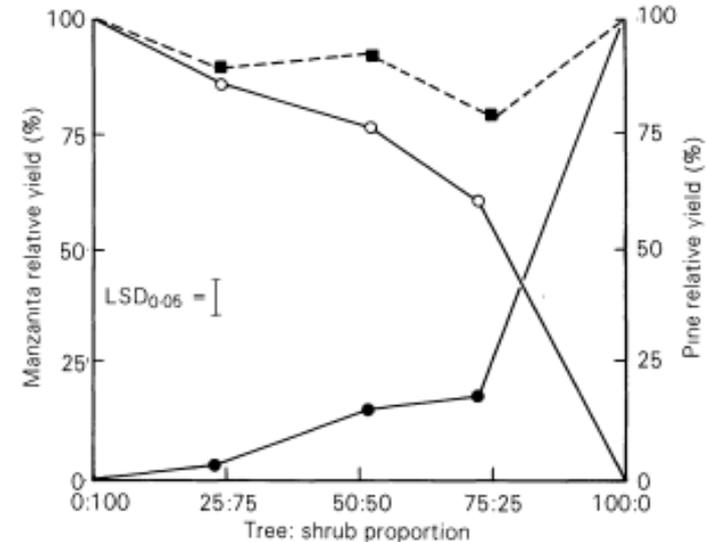
Forest Ecology

Seedlings and Sites -

- Hospitable
- Belowground unknowns
- Seedlings first
- Avoiding problems



L. J. SHAINSKY AND S. R. RADOSEVICH

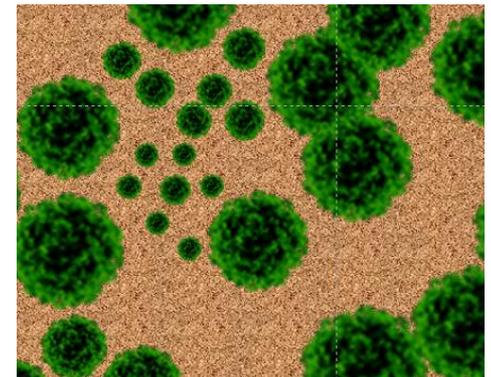
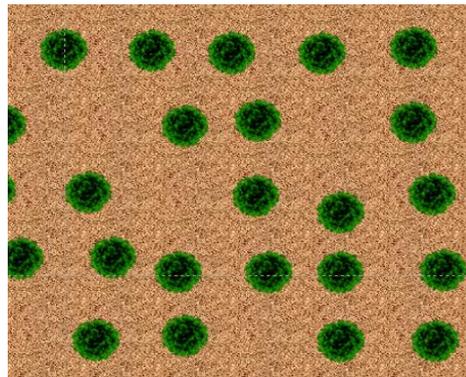
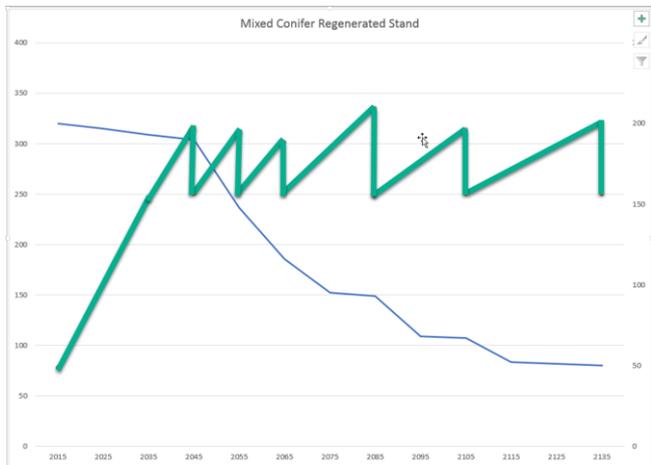
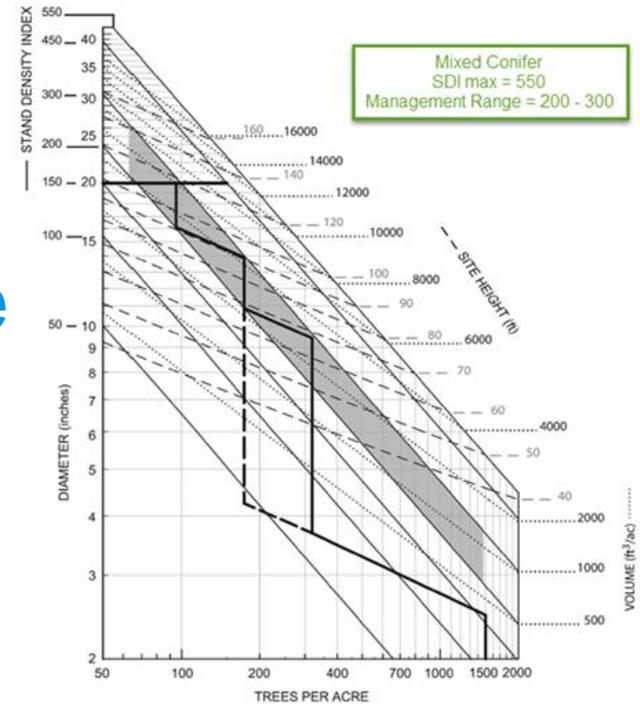


Big Question

What does it take for regenerating stands to thrive and persist?

The Long View -

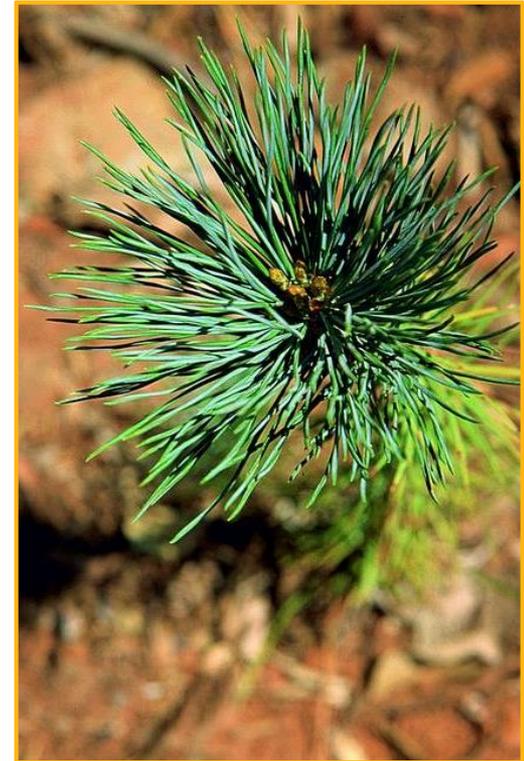
- Inevitable threats
- Incremental pathway to resilience



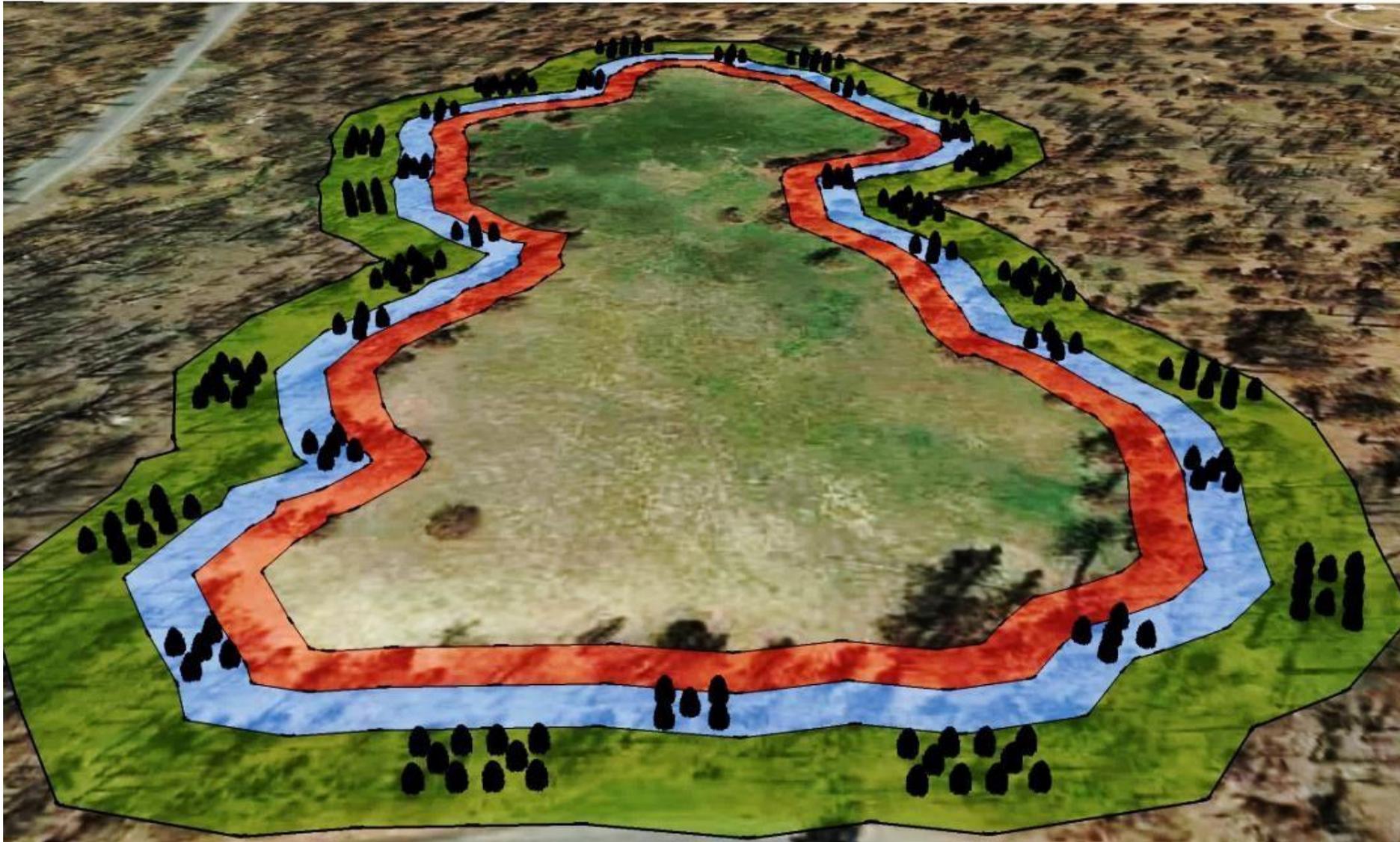
Adjusting Operational Approaches to Reforestation

Marty Gmelin

Forest Silviculturist
USFS Region 5



Landscape Considerations



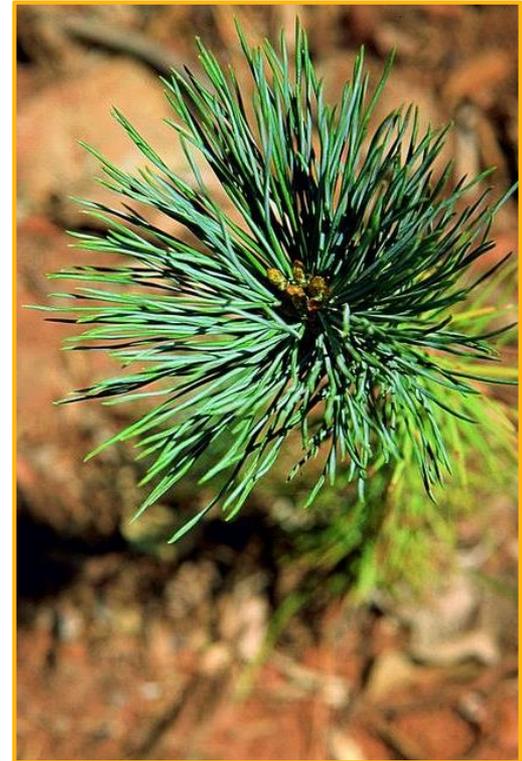
Big Question

How can we reforest in a way that allows for early reintroduction of fire into the landscape - promoting high tree survivorship and providing a way to manage the fire for resource benefits?

Reforestation: Landowner Guidance, Education & Outreach

Dr. Jodi N. Axelson

Cooperative Extension Specialist
University of California Agriculture
and Natural Resources



Tree Mortality Questions

- Trees have died on my property –
now what?
- What mix of species are best **adapted** to my property?
- If I plant **pin**es back what happen in the next drought and bark beetle outbreak?

Challenges

- Landowners need funding to implement reforestation
- Landowners in 0 - 20 acre category fall through the cracks
- Landowners require resources and education to implement

Suggestive vs. Prescriptive?

Big Question

Is reforestation necessary?

Big Questions

- 1) Will the California Seed Zone map work in a changing climate?
- 2) By topography, what planting density and spatial arrangement foster greater regeneration resilience to drought and fire?
- 3) When and how is prescribed burning best used as a silvicultural tool to increase resilience?
- 4) How can we reforest in a way that allows for early reintroduction of fire while promoting high tree survivorship and providing a way to manage the fire for other resource benefits?
- 5) What cover and distribution of shrubs will provide ecosystem benefits (i.e., habitat, fire heat sink, ...) without overtaking regenerating trees?
- 6) What does it take for regenerating stands to thrive and persist?
- 7) Is reforestation necessary, especially for private landowners?