
# WESTCARB Phase II Kickoff

## *Terrestrial Pilots: Afforestation and Reducing Emissions from Uncharacteristically Severe Wildfires*

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## Phase II Terrestrial Sequestration Overview

- Objectives
- Shasta County Pilot
  - Afforestation
  - Fuel treatments to reduce uncharacteristically severe fires
  - Conservation management on timberlands
- Lake County Pilot
  - Fuel treatments to reduce uncharacteristically severe fires
  - Assess sequestration potential for hybrid poplars
- Additional Characterization Activities
  - Enhanced fire analysis
  - Sequestration potential of fast-growing species
  - Improved baseline methodologies for conservation and fire

## Phase II Objectives: Terrestrial Sequestration

- Validate afforestation potential for rangelands
  - Determine baselines
  - Use plantings of native species across suitable rangeland site classes to establish sequestration potential on rangelands
  - Determine growth rates and establishment costs for fast-growing species adapted for dry sites
- Develop and implement methodology for determining credits for reducing emissions from uncharacteristically severe fires
  - Assess sequestration benefits and costs for implementing new fire management methods
  - Achieve market recognition of methodology for measuring and reporting carbon benefits from changing fire management
- Implement project to reduce emissions through conservation and sustainable management of forest lands



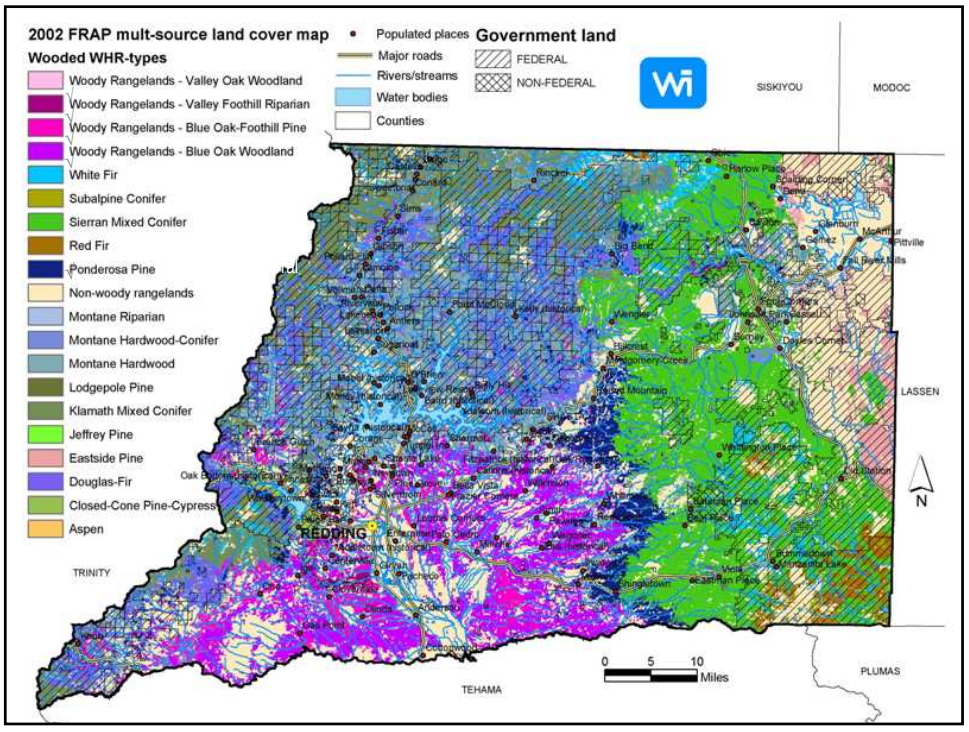
## Shasta County Partners

- Western Shasta RCD
- WM Beaty and Associates
- Pacific Forest Trust
- Wheelabrator Shasta
- California Climate Action Registry
- Climate Trust
- California Department of Forestry and Fire Protection
- California Energy Commission
- California Forest Products Commission
- US Forest Service
  - Pacific Southwest Research Station
  - Pacific Northwest Research Station (Pacific Wildland Fire Sciences Laboratory, FERA)
  - Shasta Trinity National Forest
- National Park Service
  - Whiskeytown National Recreation Area
  - Lassen Volcanic National Forest
- Bureau of Land Management
- Pacific Gas & Electric
- Bascom Pacific LLC

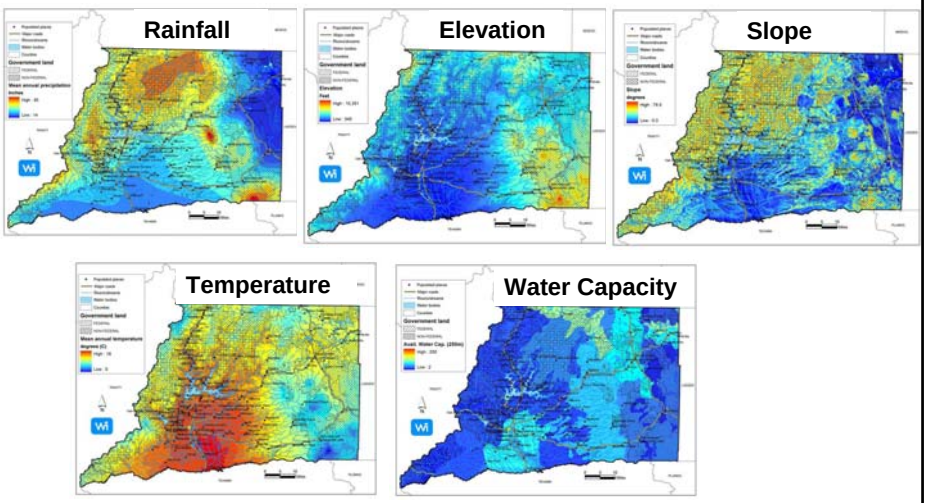
## Validate Afforestation Potential of Rangelands

- Classify lands according to potential for afforestation
- Set criteria for distribution of pilot plantings
- Prepare plan for planting
- Convene technical panel to review choices
- Review site history and take initial field measurements (baseline)
- Collect data on establishment and maintenance costs





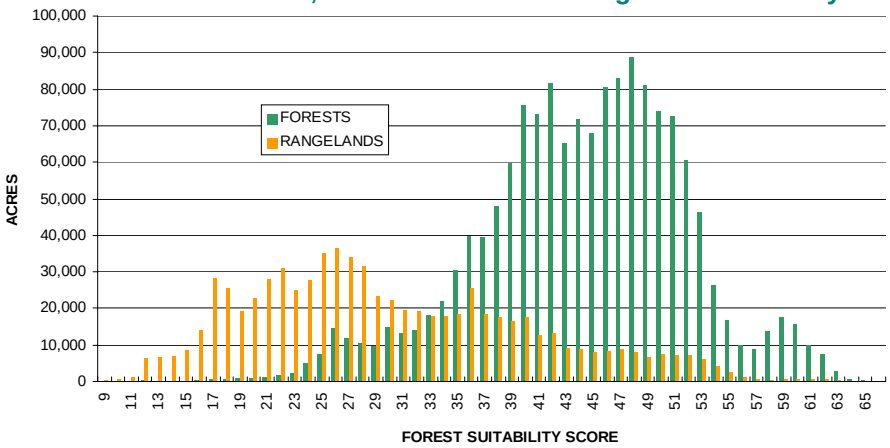
## Inputs for Classification



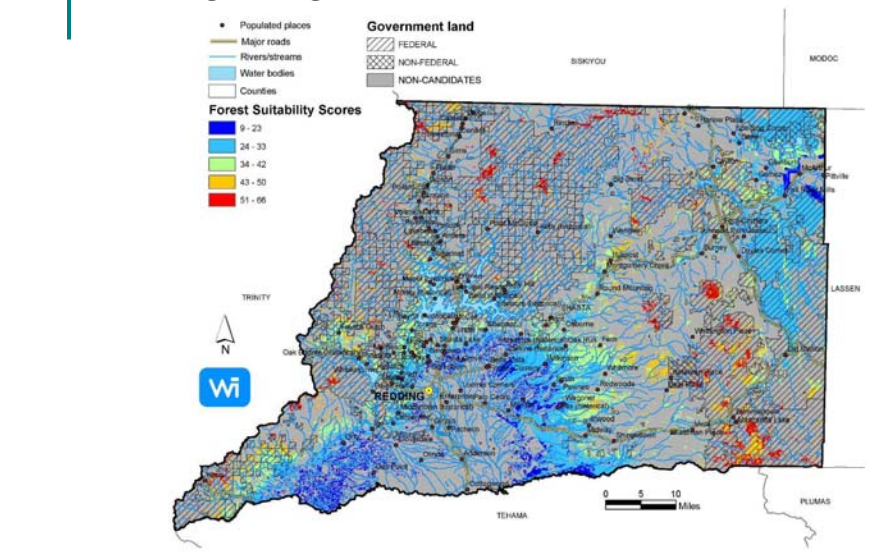



## Shasta County Forest Suitability

**Overlap of rangeland classes in Shasta County (with canopy closure <40%) that have the same biophysical characteristics as current forests ~550,000 acres or 73% of rangelands in county**

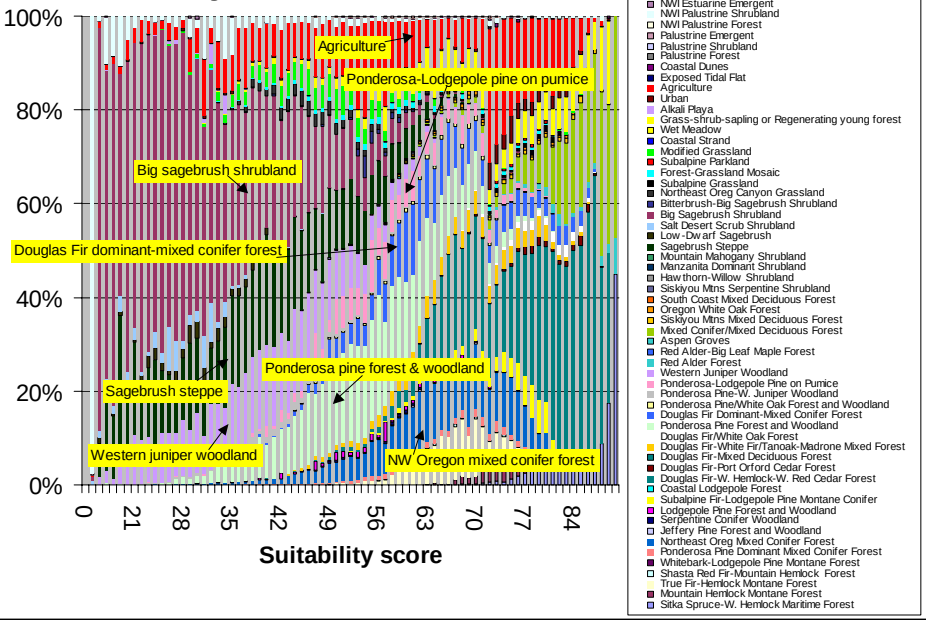


## Existing Rangelands Suitable for Forests






## Species Mix for Various Suitability Scores



## Site History and Initial Carbon Stocks






## Tree Selection

- Work with private and public partners
- Review science concerning range of expected climate changes in Shasta County
  - Reduced snow pack and change in timing of peak water availability
  - Greater variability in quantity and distribution of rainfall
  - Changes in temperature patterns
  - Changes in pest and disease vectors
- Review native species and assess suitability for afforestation of rangelands
  - Assess establishment and maintenance costs
  - Special attention to dryer sites with variable rainfall
- Convene technical review panel

## Lake County Partners

- Lake County Resources Initiative
- Oregon Department of Forestry
- Oregon State University
- Greenwood Resources
- California Climate Action Registry
- Climate Trust
- Oregon Forest Resources Institute
- Collins Company
- Jeld-Wen Timber and Ranch
- US Forest Service, Fremont National Forest
- Bureau of Land Management



## Develop Methodology for Fire Credits from Reducing Hazardous Fuels

- Convene technical panel to identify available data and relevant models that assess the effect of fire on carbon stocks
- Review and test relevant models
- Prepare draft methodology
- Review pilot site characteristics
- Collect field data from chronosequenced sites
- Use field data to validate methodology

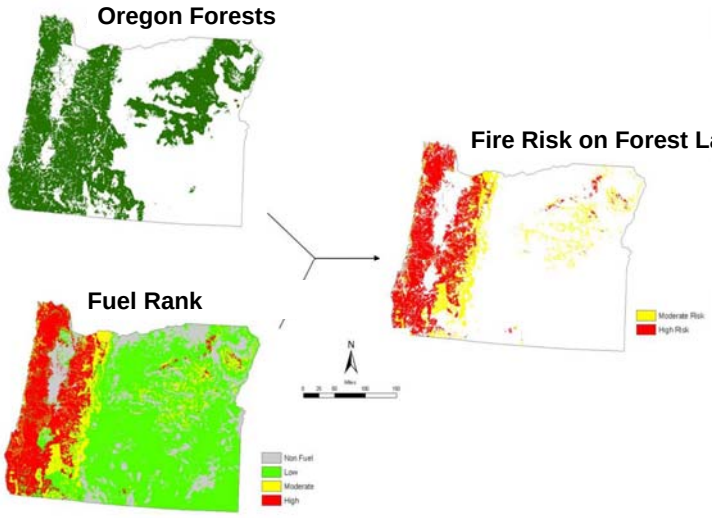
## First Challenge—Setting Baseline

2004 French Gulch Fire

- Assign fire risk and set rules to predict intensity
- Quantify loss of carbon stocks due to fires of different intensities
- Predict fire return intervals
- Determine existing carbon stocks on lands at risk



## Fire Risk

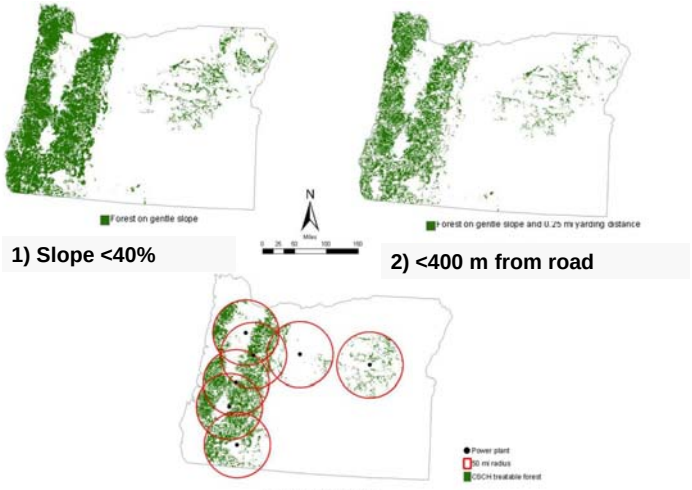


## Fuel Treatments to Reduce Uncharacteristically Severe Fires

- Review and classify lands where fuel treatments will occur
- Design measurement and monitoring plan
  - Measure overall carbon stocks
  - Measure removals of hazardous fuels
- Select and carry out fuel treatments
  - Transport fuels to biomass energy facility
  - Collect data on transport and treatment costs
  - Analyze carbon benefits from biomass energy component



## Suitability of Sites for Fuel Treatment

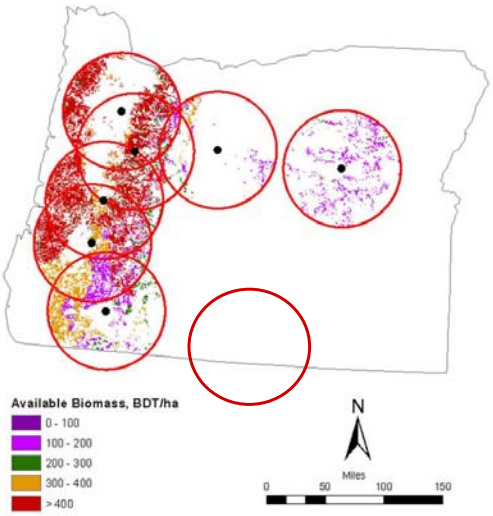



**1) Slope <40%**

**2) <400 m from road**

**3) Within 50 miles of power plant**

## Available Biomass Fuels Near Power Plants




Lake County does not currently have a biomass energy plant. The Oregon Solutions Project is trying to identify sufficient fuel to attract a private investor to build a plant.





## Additional Characterization

- Extend fire analysis to other sites
  - Collect field data from chronosequenced sites to improve accuracy of emission estimates across various forest types found in the region
  - Review opportunities for new sites where forest lands are at moderate to severe risk of fire on lands with <40% slope within 400 meters of existing roads and sufficient potential fuel within 50 miles

## Additional Characterization Activities

Evaluate sequestration potential for fast-growing species

9 years diameter growth

- ***Douglas Fir*** 4 dry t/acre/yr ~50 year rotation
- ***Hybrid Poplar*** 10 dry t/acre/yr 6–8 year rotation

*Source: Jon Johnson Associate Professor*
*Washington State University*



## Forest Conservation

Photo: Tim Pearson, Winrock International

- Stop forest conversion to non-forest
- Maintain working forest lands
- Sierra Mixed Conifer (150 year old forest)
  - **575 $tCO_2$/acre**
- Redwood (150 year old forest)
  - **730 $tCO_2$/acre**

## Achieve Market Recognition and Validation

- Climate Trust
- California Climate Action Registry



## Outreach

- Stakeholder meetings
- California Forest Products Commission
- Oregon Forest Resources Institute