

2019 FBRI/WFCA Silviculture Cost Survey Results

A Presentation for the
3rd Annual PNW Forest Vegetation Management Conference
Wilsonville, Oregon
December 4 & 5, 2019

Dan Opalach, PhD
Senior Forest Biometrician
Forest Biometrics Research Institute



Economic Results of a PNW Silvicultural Cost Survey: Are you swimming above or below the Financial Waterline?

2016 PNW Reforestation Council Annual Meeting

James D. Arney, Ph.D.

Forest Biometrics Research Institute

Portland, Oregon

October 4, 2016



Thank You!

- ▶ *Dr. Jim Arney*
- ▶ *Mr. Richard Zabel*
- ▶ *Ms. Melinda Olson*
- ▶ *Mr. Brock Purvis*
- ▶ *The 53 Respondents!!!*

Any screw ups are all mine...



2019 Silviculture and Harvesting Cost Survey

The Forest Biometrics Research Institute and Western Forestry and Conservation Association are surveying Pacific Northwest foresters on the operating costs for growing and harvesting trees. We are looking to collect average costs for site prep, planting, brush control, precommercial thinning, and harvesting/hauling. All answers will be anonymous, grouped into averages, and not tied to any specific ownership.

The compiled survey results will be available to anyone who requests them at the end of the survey. In addition, we plan to compare the 2019 survey data with data collected from two prior surveys. Survey respondents who have made a request for results, will also receive this cost trend analysis.

We hope you will take the time to contribute information to this valuable set of data to establish a current baseline for operational forestry costs. If you have any questions regarding this survey, please contact Dan Opalach at (971) 940-2409 or dan@forestbiometrics.org.

Cost Categories in the Survey

- ▶ **Annual Operating Expense**
 - Staff, Buildings, Roads, Overhead
- ▶ **Site Preparation**
 - Herbicide, Mechanical, Prescribed Burning
- ▶ **Planting**
- ▶ **Brush Control**
 - Herbicide, Manual, Mechanical
- ▶ **Pre-Commercial Thinning**
- ▶ **Commercial Thinning**
- ▶ **Harvesting Operations**
 - Clearcut, Selection

Costs to be covered during today's presentation

Summary by Region

► 53 Organizations Responded to the 2019 Survey

- Not everyone provided responses to every question
- Breakdown by Region:

Region	Count	Acres
Westside Oregon or Washington	37	3,231,296
Idaho-Montana	9	1,923,053
Eastside Oregon or Washington	3	289,543
Northern California	4	115,496
Grand Total	53	5,559,388

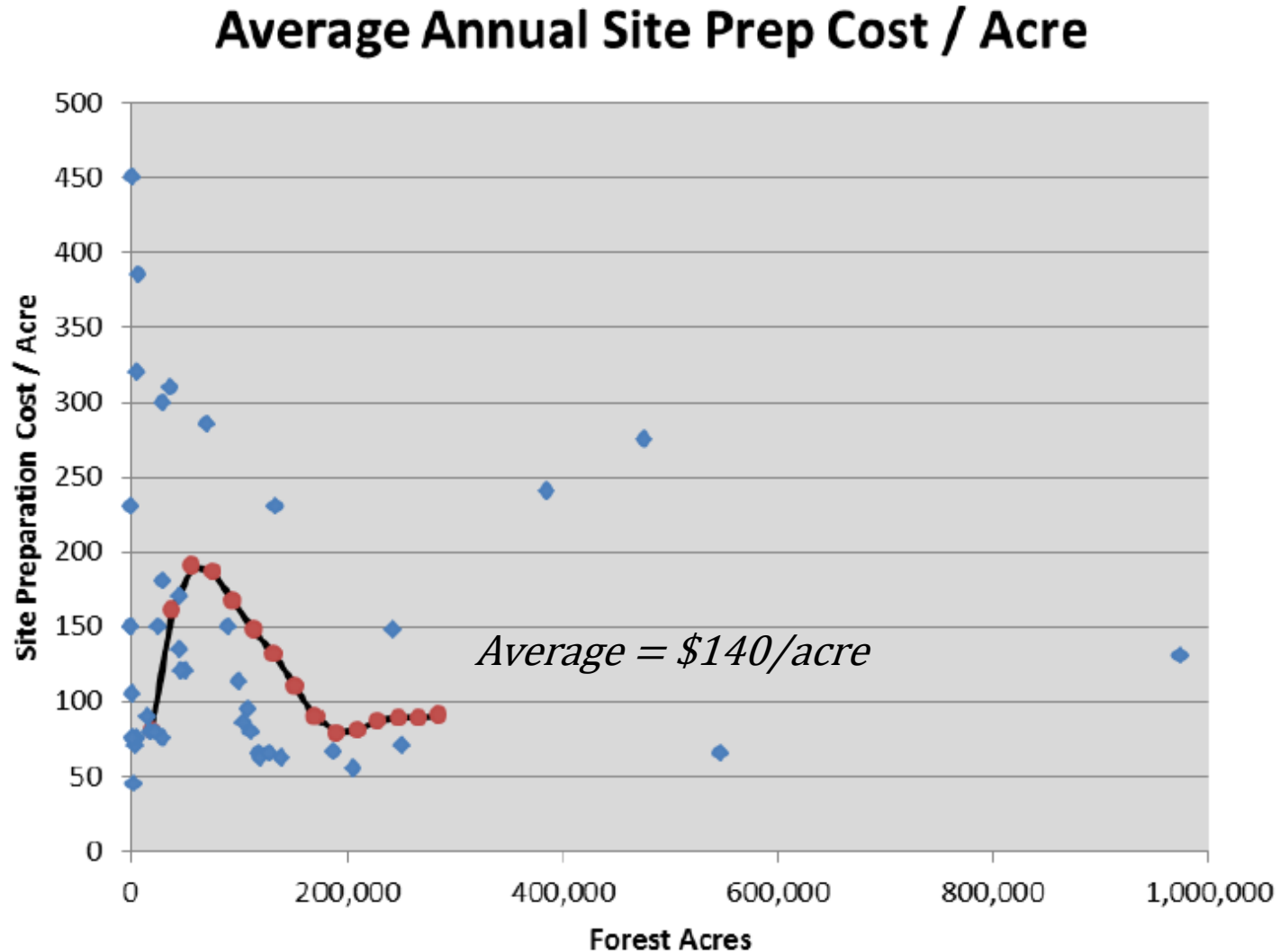
58 organizations covering 5,969,000 acres contributed to the 2016 survey

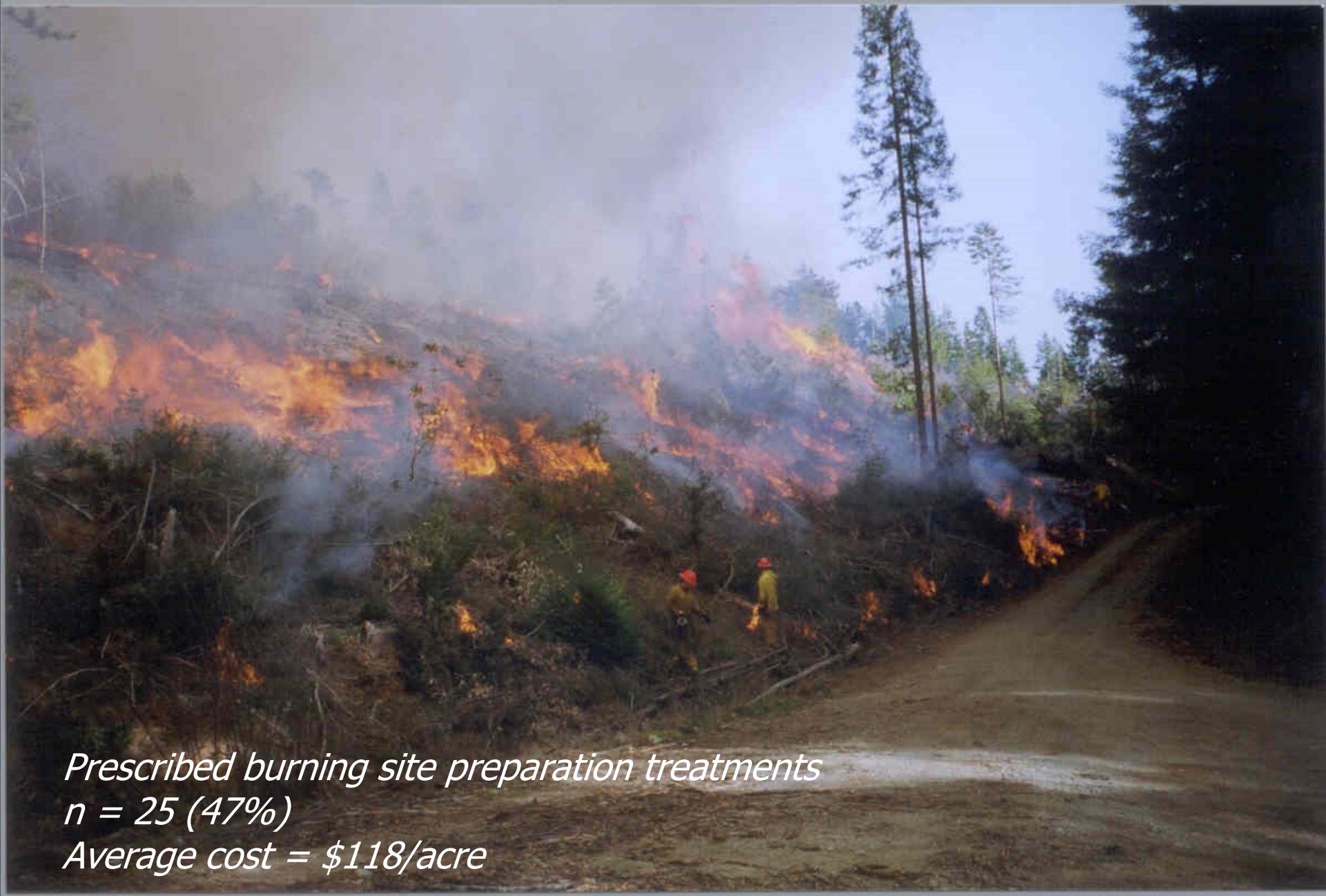
Responses by Ownership Category

Ownership Category	Count	Acres
Private	34	3,971,649
Public-non-federal	8	1,072,662
Mgt service/Consulting firm	7	274,306
Tribal	3	169,771
Non-governmental organization	1	71,000
Grand Total	53	5,559,388

Site Preparation Costs

2016 Survey Results





*Prescribed burning site preparation treatments
n = 25 (47%)
Average cost = \$118/acre*

Mechanical site preparation treatments

n = 32 (60%)

Average cost = \$191/acre



*Herbicide site preparation treatments
n = 40 (75%)
Average cost = \$91/acre*

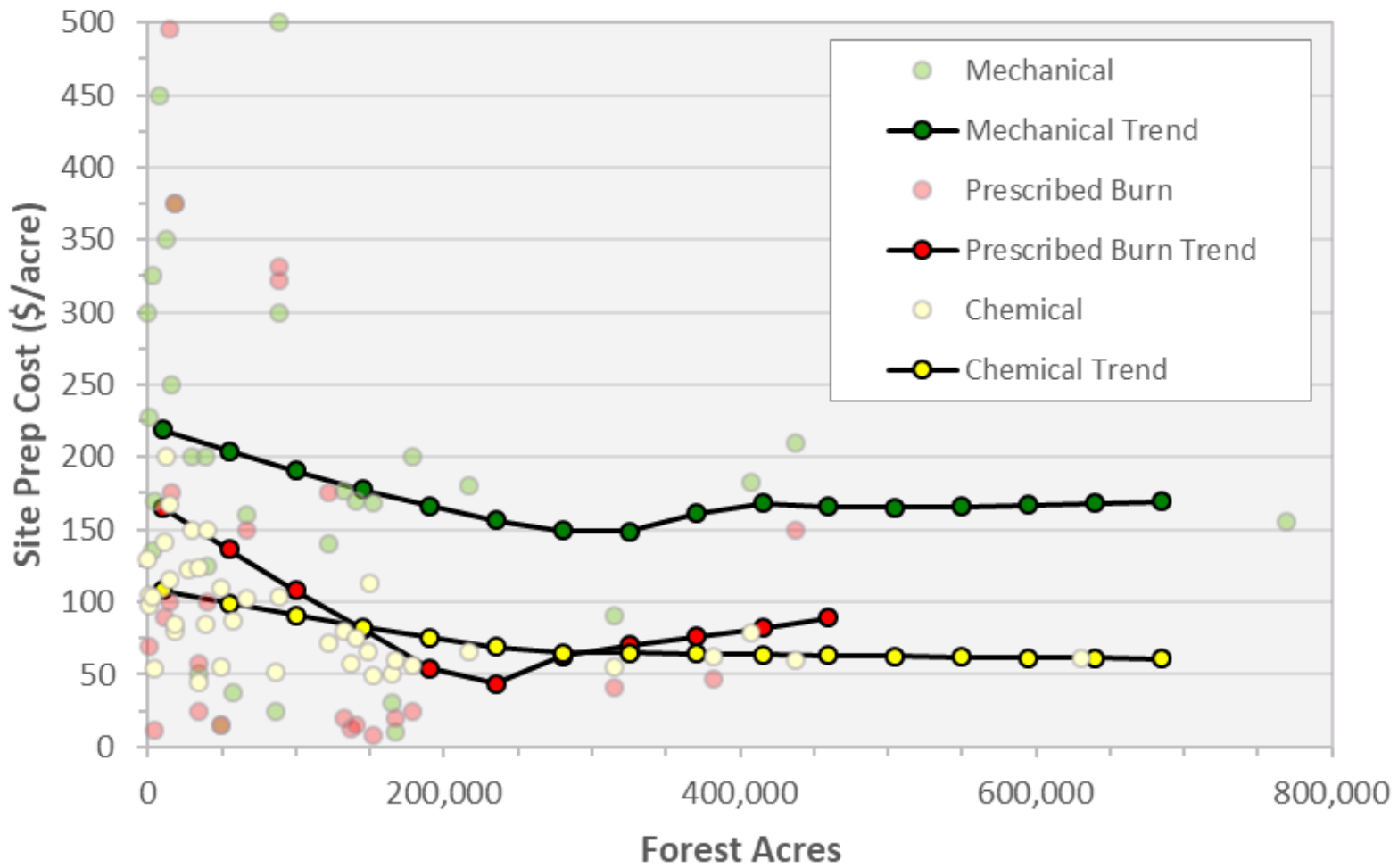


Site Preparation Costs

Site Preparation Method	Sample Size	Average Cost (\$/acre)
Prescribed burning	25	\$118
Mechanical treatments	32	\$191
Herbicide applications	40	\$91

- ▶ **There is lots of variation in the data**

Site Prep Cost (\$/acre) by Method



Reforestation Costs

(\$/acre)

Reforestation Cost = **Planting Cost** + **Seedling Cost**

Planting Cost

- **Includes planting labor, supplies, storage, transportation**

Seedling Cost

- **Includes the nursery, seed**

Reforestation Costs

(\$/acre)

The 2019 survey asked respondents to provide information for

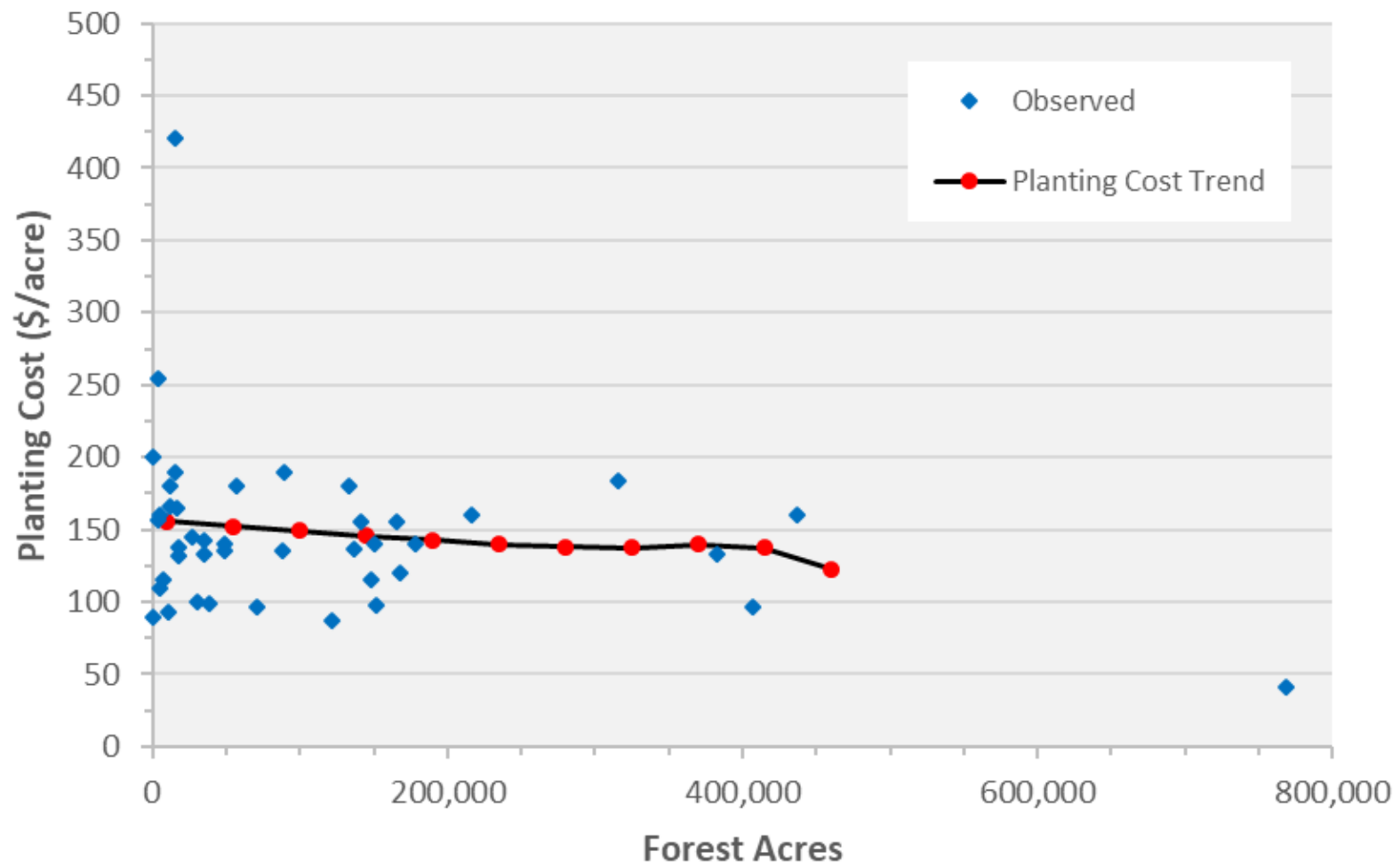
- **Clearcut units (n=42)**
- **Selection units (n=12)**

Planting Cost

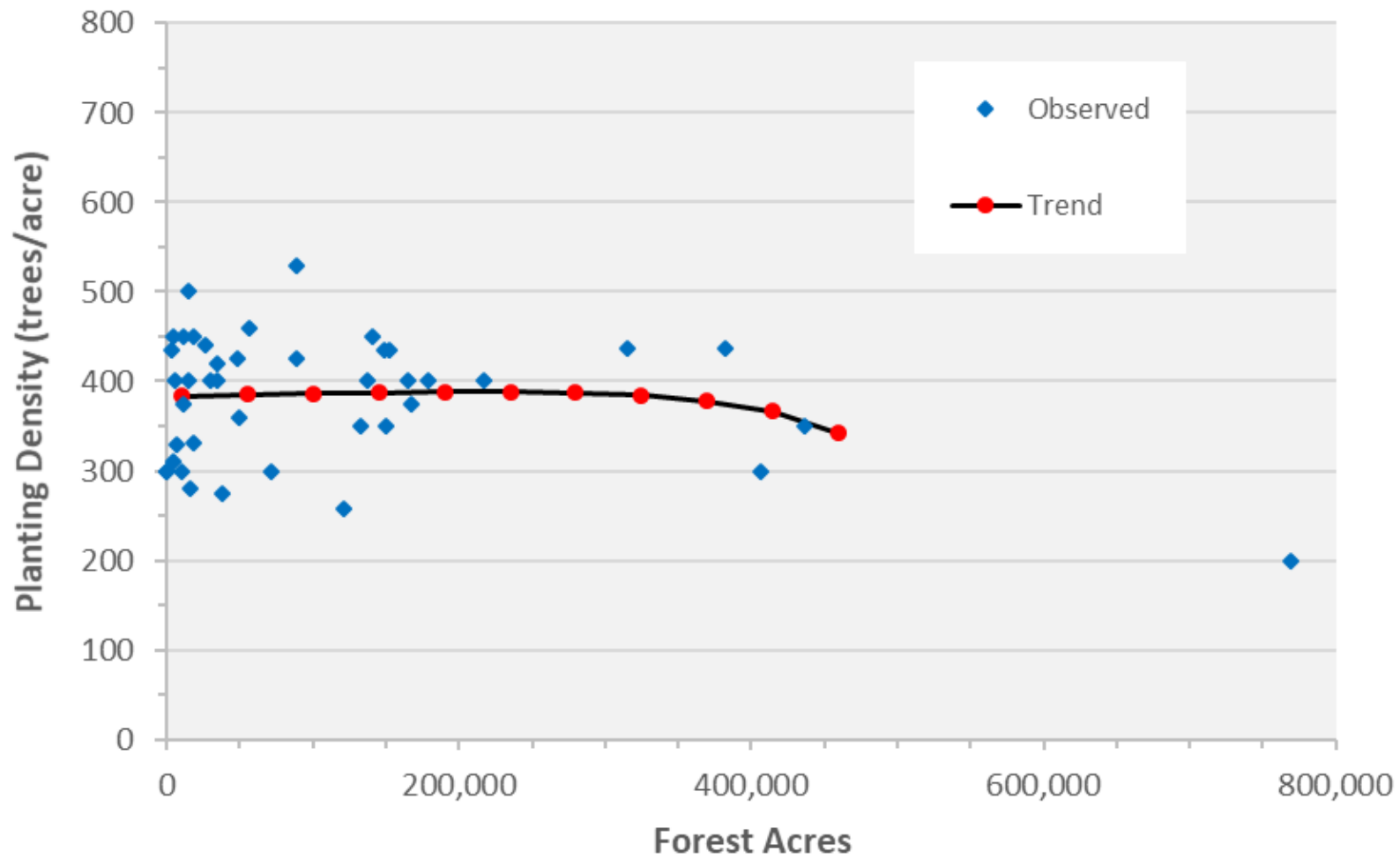
- Includes planting labor, supplies, storage, transportation



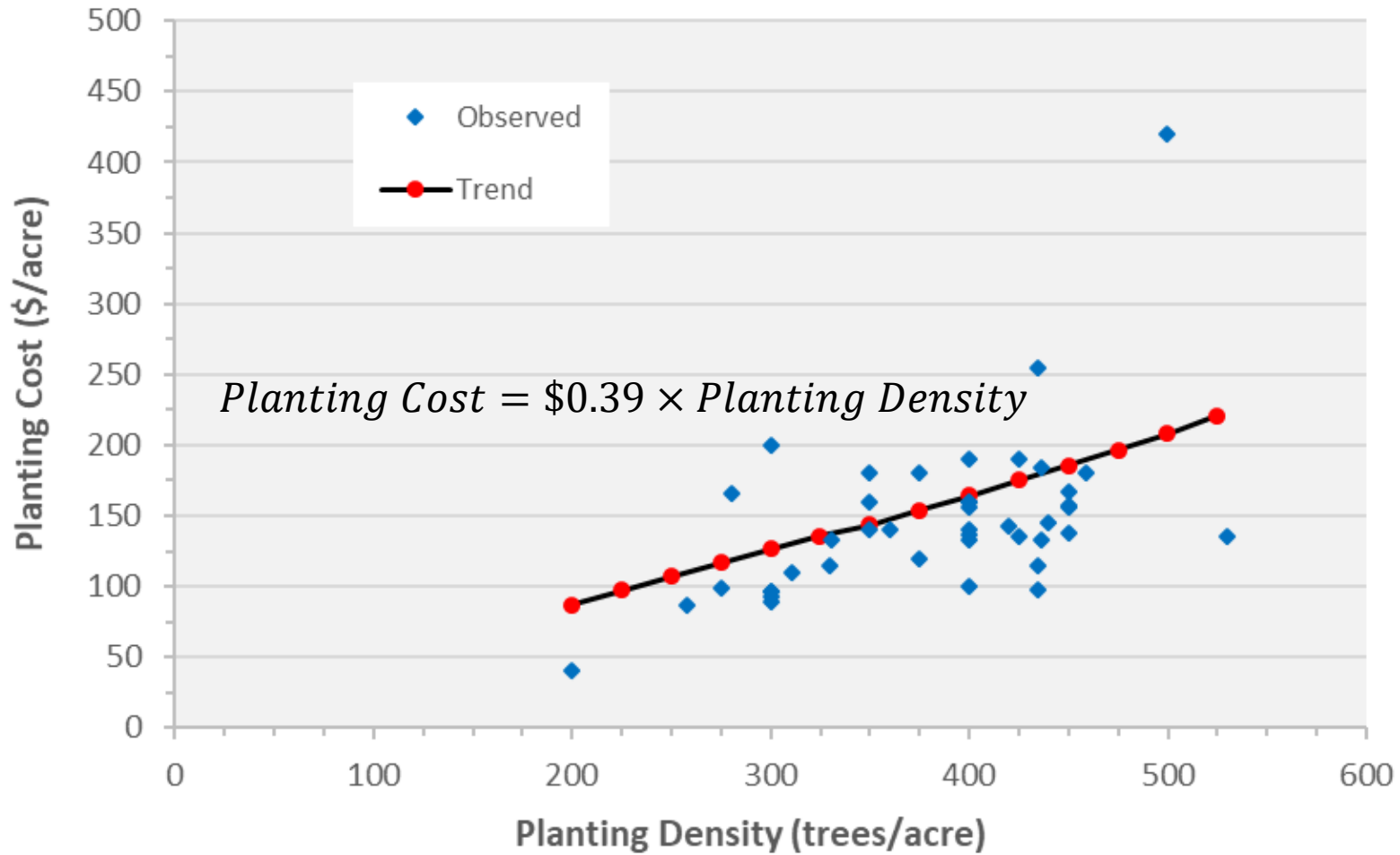
Planting Cost (\$/acre)



Planting Density (trees/acre)



Planting Cost (\$/acre) Clearcut Units





Seedling Cost—

Glenn Lehar at the Green Diamond containerized nursery in Korbek, California, holding a redwood clone

A photograph showing a small Ponderosa pine seedling in a styro plug, placed on reddish-brown soil. A large, dried pine cone is positioned next to the seedling for scale. The background shows more soil and some dry pine needles.

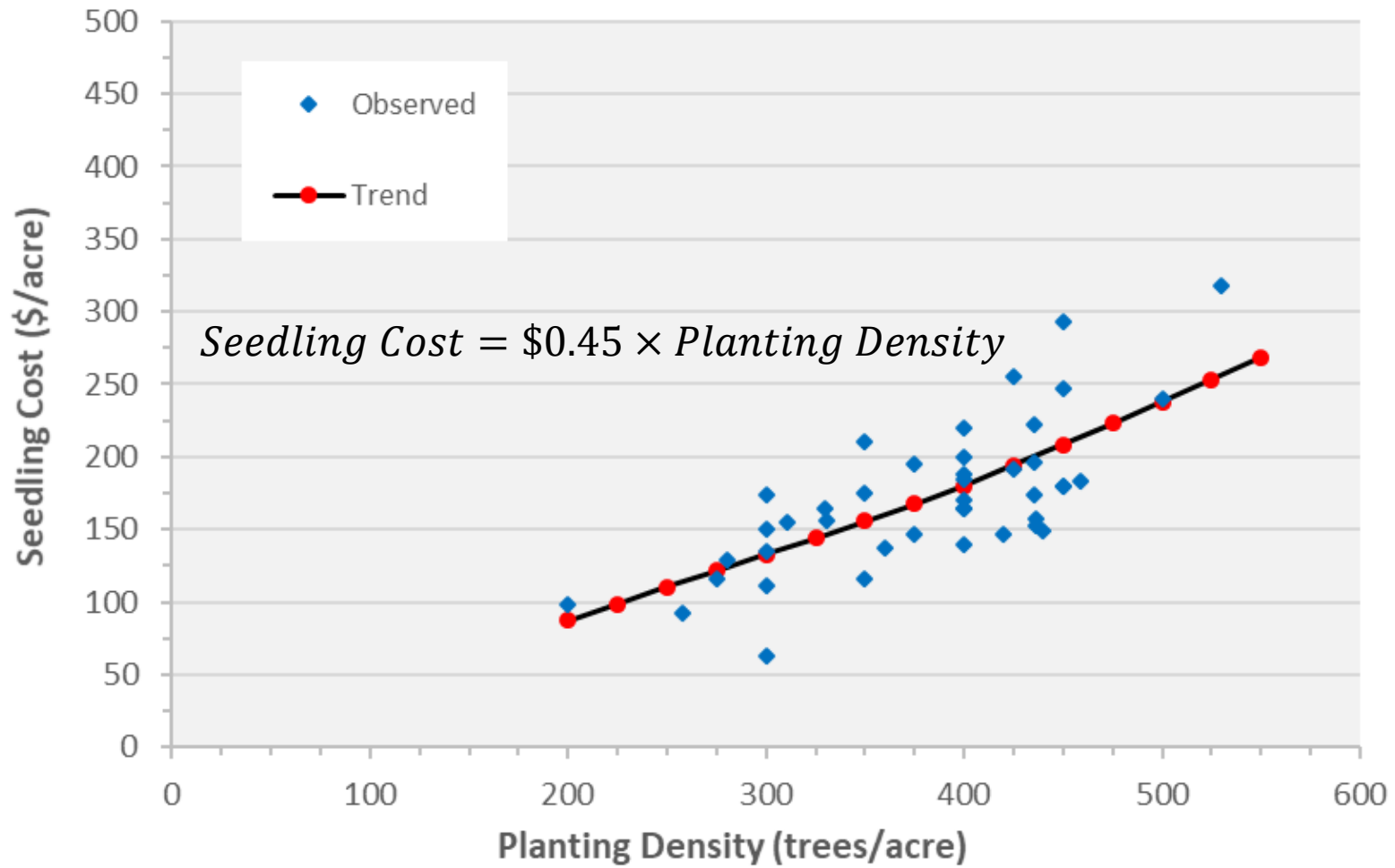
Seedling Cost—

Ponderosa pine styro 10D plug

Blacks Mountain Experimental Forest

Lassen County, California

Seedling Cost (\$/acre)



Reforestation Costs by Silvicultural Method

Silvicultural Method	Average Number of Trees Planted (#/acre)	Average Planting Cost (\$/acre)	Average Planting Cost (\$/tree)	Average Seedling Cost (\$/acre)	Average Seedling Cost (\$/tree)
Selection	224	\$123	\$0.55	\$106	\$0.47
Clearcut	383	\$148	\$0.39	\$172	\$0.45
<i>Difference</i>			\$0.16		\$0.02
<i>Percent</i>			42%		5%

Brush Control After Planting

(\$/acre)

- ▶ **Treatments to reduce unwanted brush competition after planting**
- ▶ **Methods**
 - **Herbicide**
 - **Manual**
 - **Mechanical**
 - **Nothing**
- ▶ **Respondents were asked to provide information on a “primary” treatment and a “secondary” treatment”**

*Primary treatment
Tanoak treated with imazapyr*



*Secondary treatment
Blueblossom/tanoak treated with triclopyr*

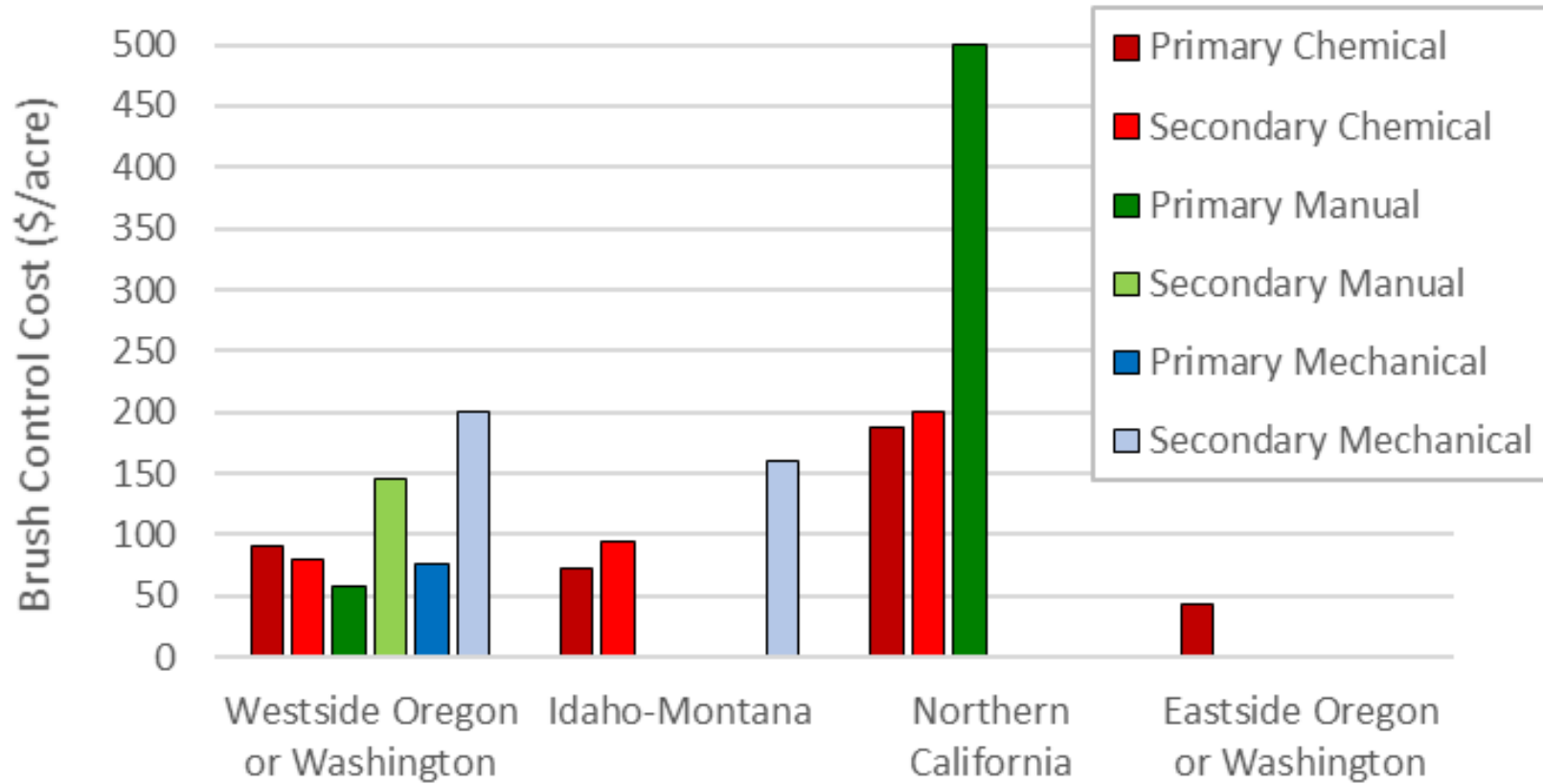


05/13/2009

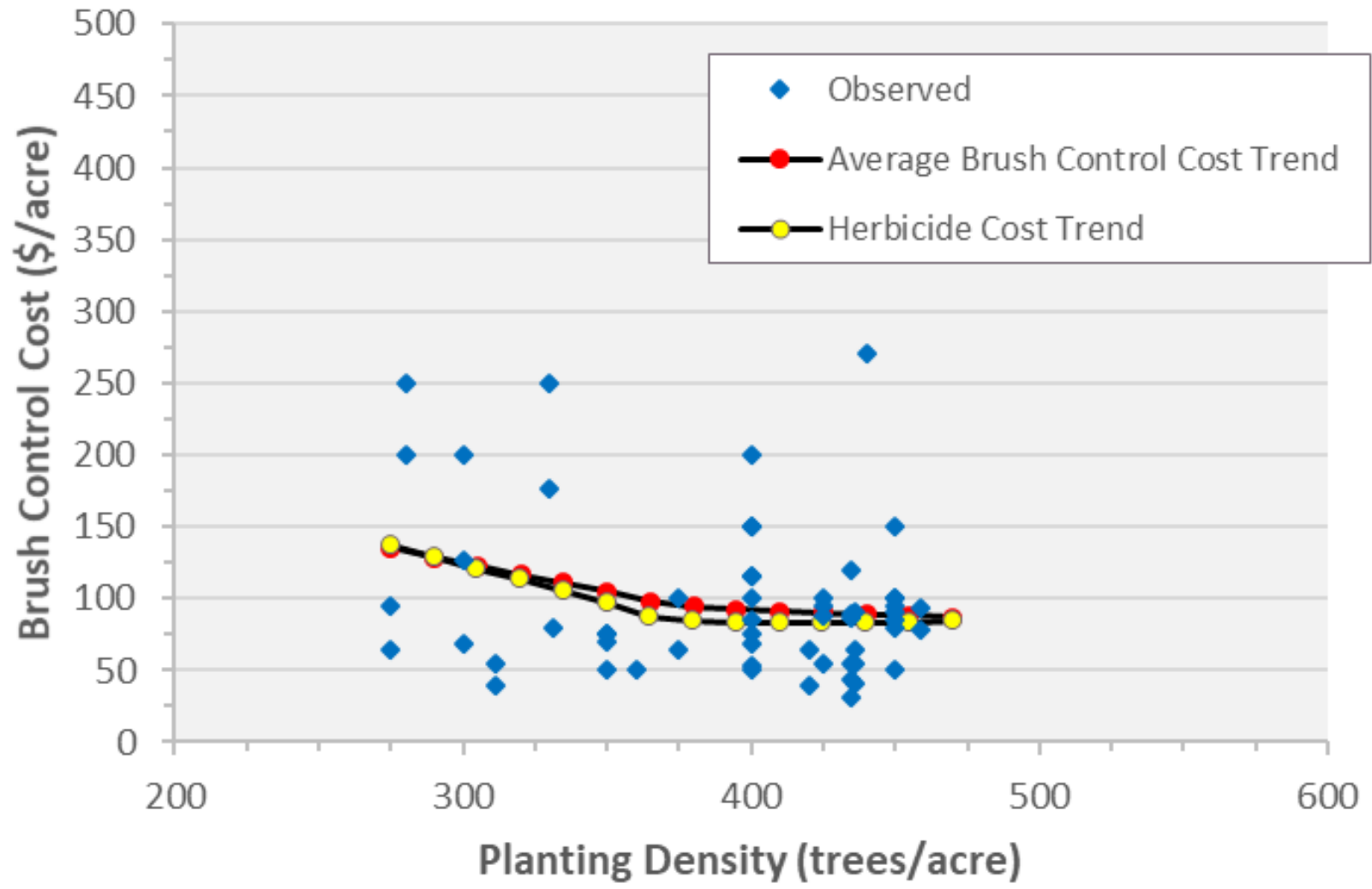
Brush Control Responses

Treatment	Primary	Secondary
Herbicide	35	17
Manual	5	4
Mechanical	3	3
Total	43	24
Percent (n = 53)	81%	45%

Brush Control Treatments - After Planting



Average Brush Control Cost (\$/acre)



Aerial Herbicide Application Cost

- ▶ Respondents were not asked to specify application method
- ▶ In the comments section, however, five respondents indicated that their cost figure was for aerial applications
- ▶ The average for these five data points was

\$62/acre



*Pre-commercial thinning in Ponderosa Pine
Whitmore, California*

*Pre-commercial thinning study in redwood
Jackson Demonstration State Forest
Fort Bragg, California*



Pre-Commercial Thinning

▶ PCT Objectives

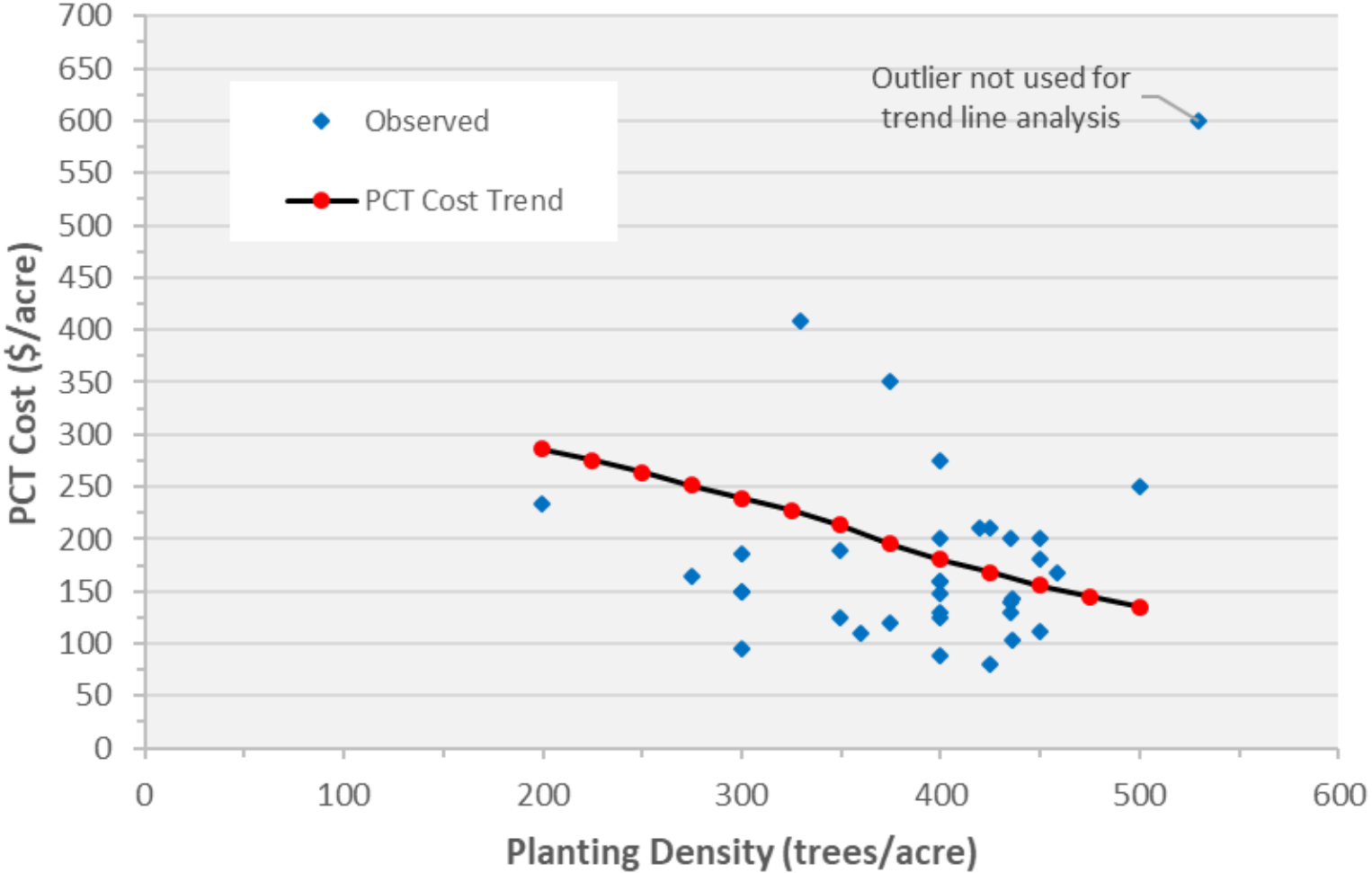
- Reduce Stocking
- Improve Species Composition
- Concentrate Growth on Crop Trees

▶ 39 of 53 Organizations Reported PCT Data

▶ Cost Trend over Time

- Survey 2011 = \$138 /ac to Remove 700 TPA
- Survey 2016 = \$154 /ac to Remove 400 TPA
- Survey 2019 = \$230 /ac to Remove 480 TPA

Pre-Commercial Thinning Cost (\$/acre)



15 years old, manually released twice



The boundary



*15 years old, herbicides, PCT
and 30x the biomass!*



Questions?

