Sagebrush Steppe
SageSTEP
Treatment Evaluation Project

- **Introduction**
- **Short-term Results: Sage-Cheat Experiment**

  James McIver, Oregon State University

- **Short-term Results: Woodland Experiment**

  Bruce Roundy, Brigham Young University

- **Economic Viability of Sagebrush Steppe Treatments**

  Kim Rollins, University of Nevada - Reno

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Joint Fire Science Program

A collaborative research project among:

Oregon State UNIVERSITY OSU

BYU BRIGHAM YOUNG UNIVERSITY

University of Nevada, Reno

UtahState UNIVERSITY

U.S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT

University of Idaho

USGS science for a changing world

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

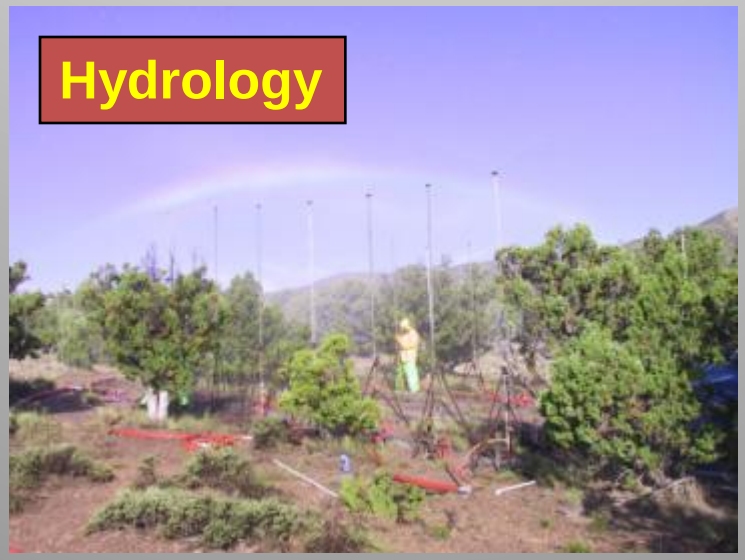
U. S. DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION

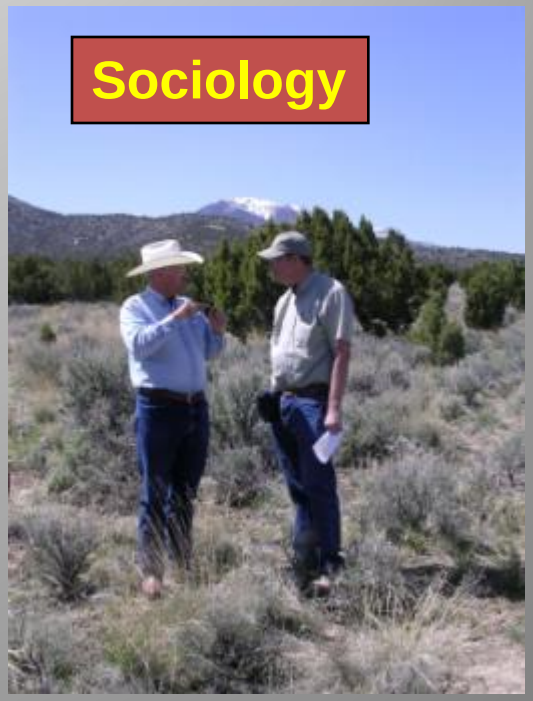
USDA ARS

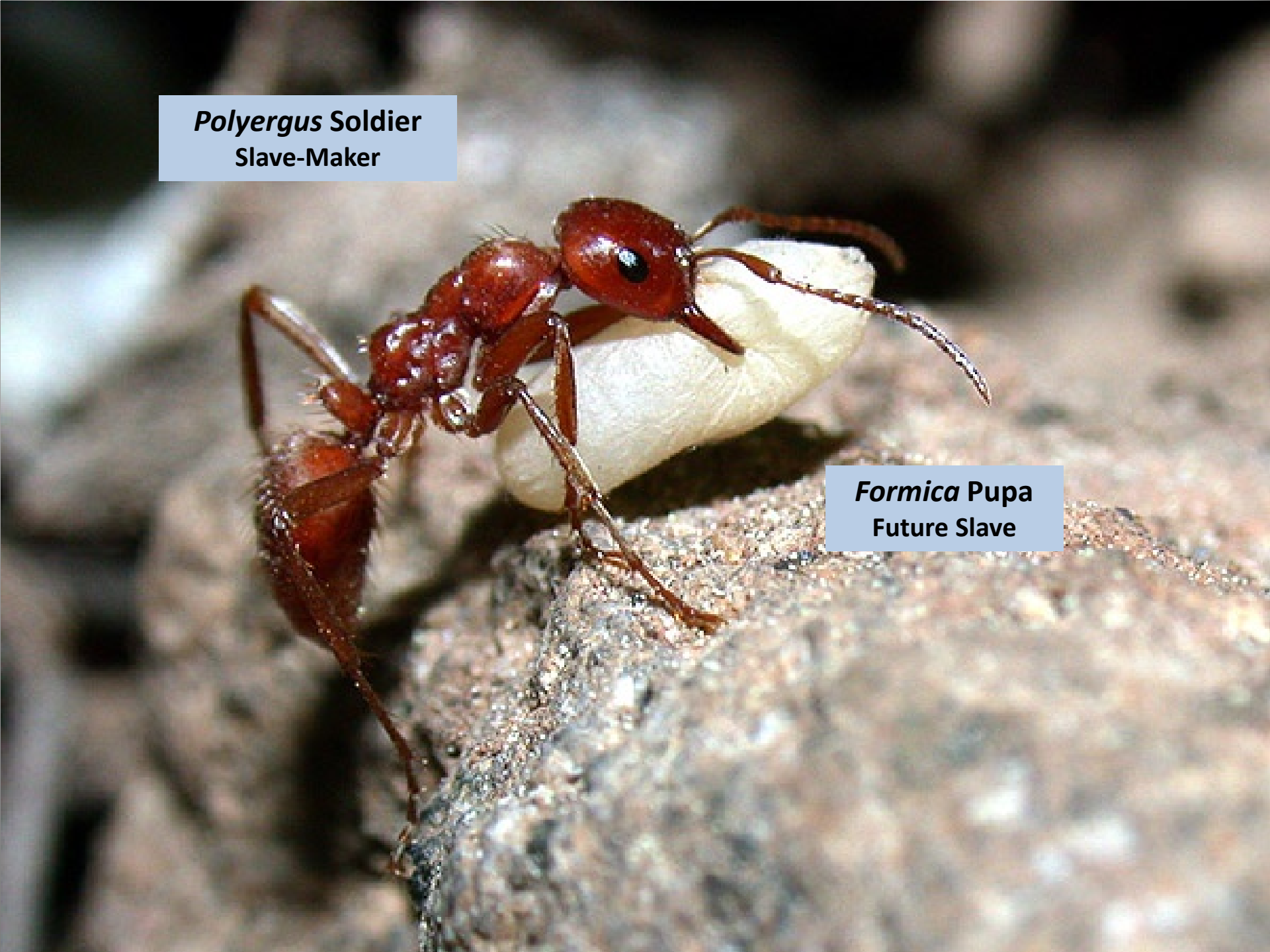
U.S. FISH & WILDLIFE SERVICE DEPARTMENT OF THE INTERIOR

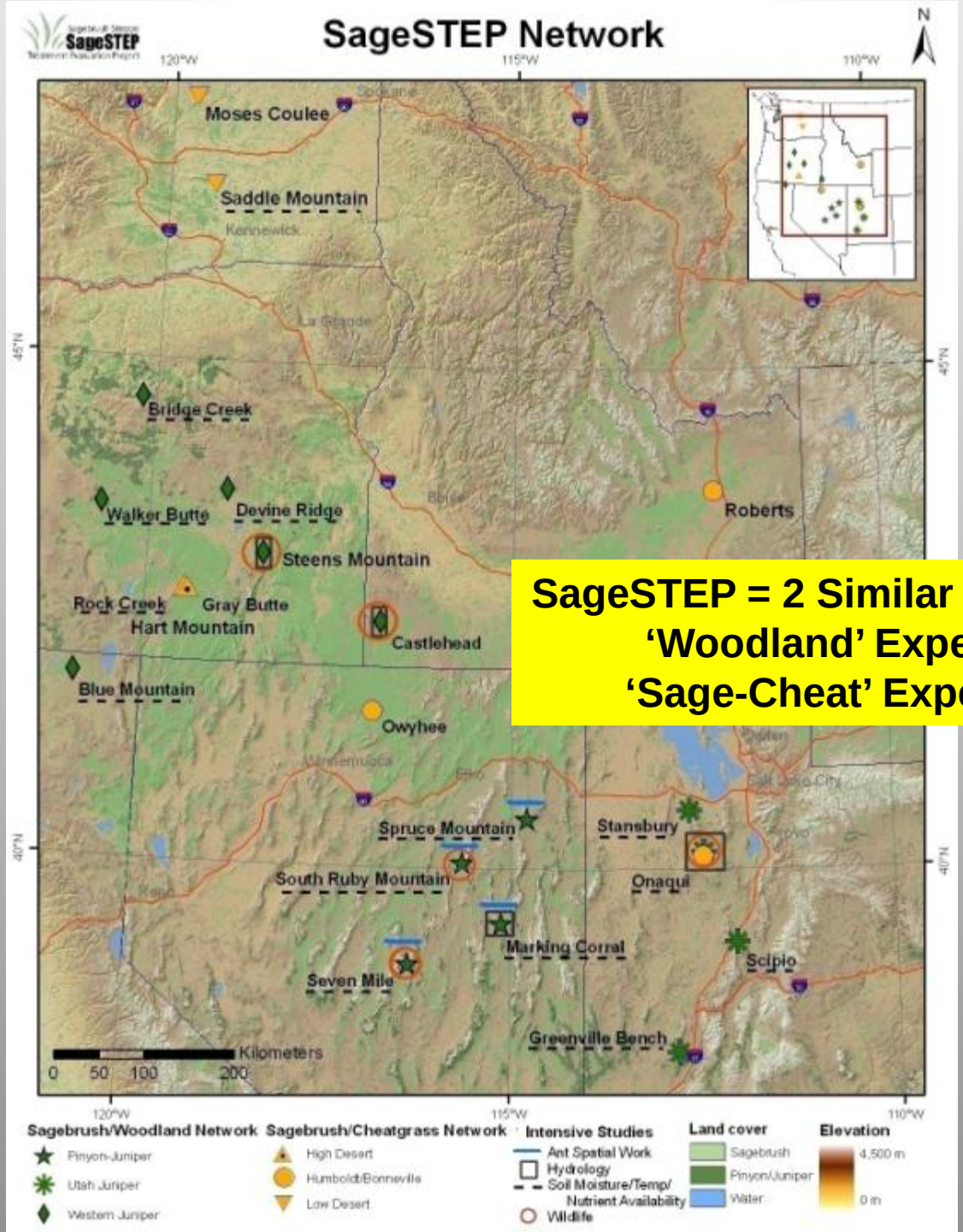
The Nature Conservancy SAVING THE LAST GREAT PLACES ON EARTH

Fully Interdisciplinary Approach





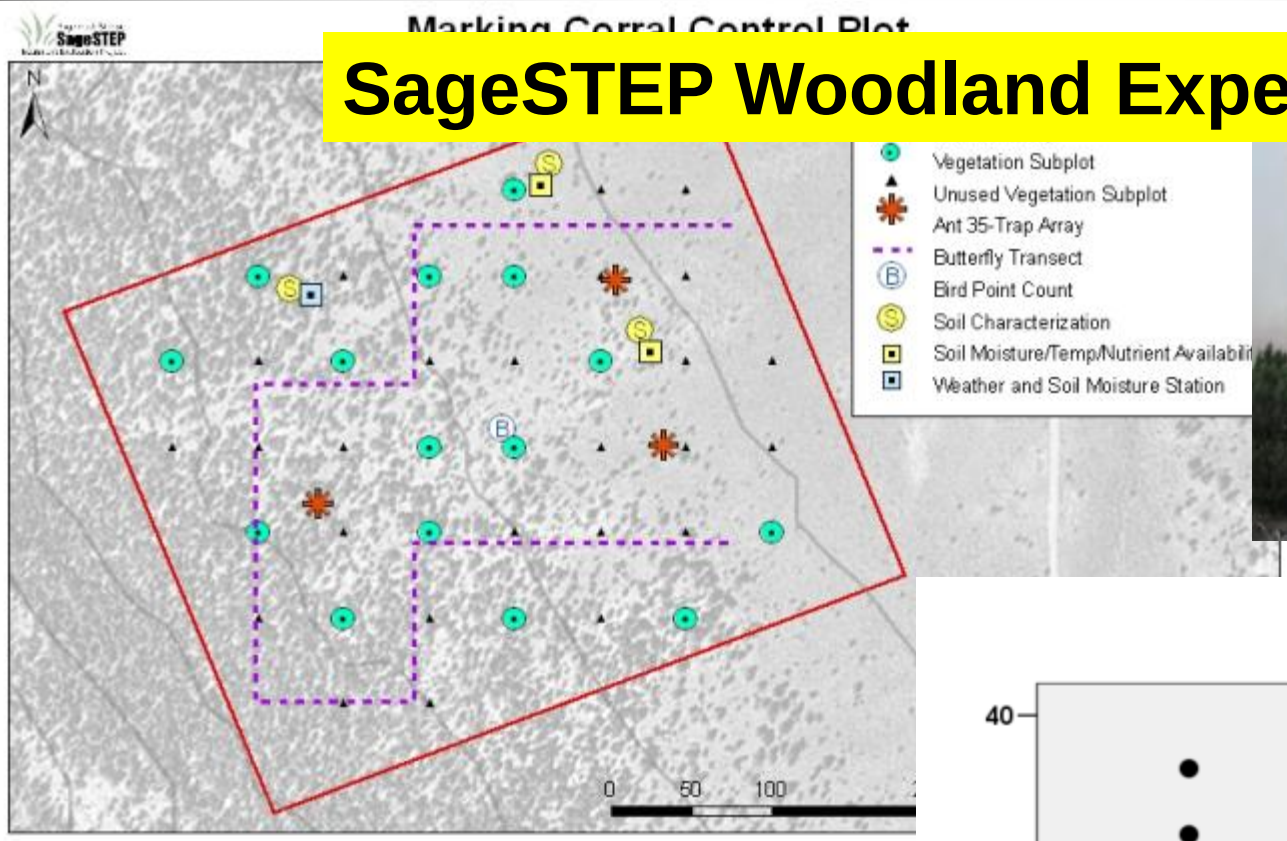

Polyergus Soldier
Slave-Maker
Formica Pupa
Future Slave

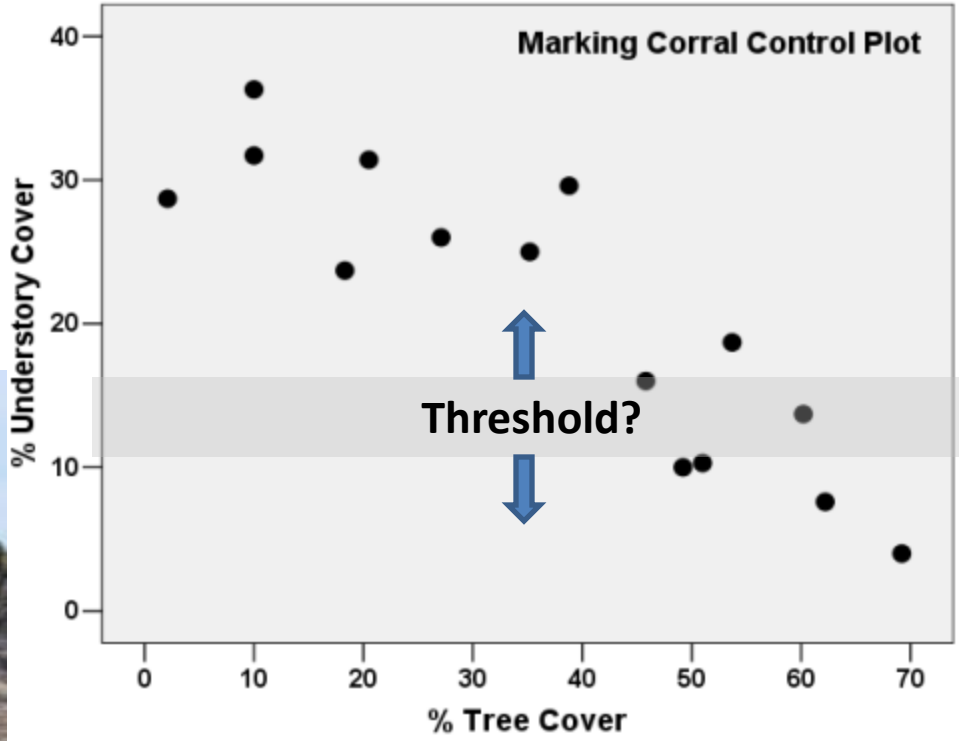


SageSTEP = 2 Similar Experiments
'Woodland' Experiment
'Sage-Cheat' Experiment'

Shoshone Mts. -- 2005

SageSTEP Woodland Experiment





Tree-less Wyoming Big Sage – The Problem

Fuel Reduction & Rangeland Practices

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Sage-Cheat Experiment

- Four treatments/site (fire, mow, herbicide & control)
  - 18 pre/9 post-treatment subplots/trmt (30x30 m)
  - Plateau nested within each treatment
- Response variables
  - Foliar cover using line-point intercept
  - Basal gaps among perennial plants

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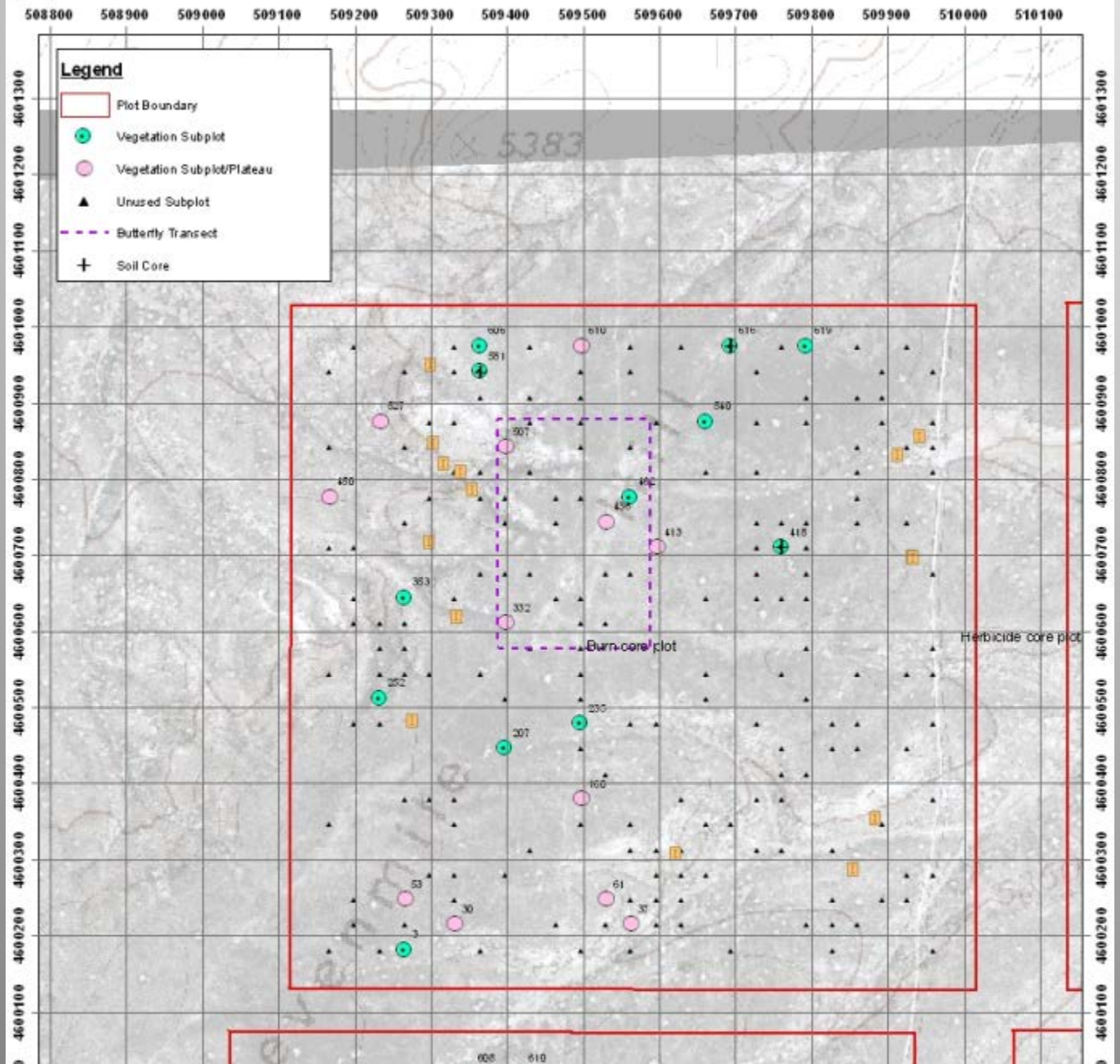
Datum/Projection (display units): NAD 83 UTM Zone 11N (meters)

Owyhee Cheatgrass Burn Core Plot

DeLorme Gazetteer
p. 22 grid F1
Benchmark Gazetteer
p. 34 grid E2



Thresholds of resilience

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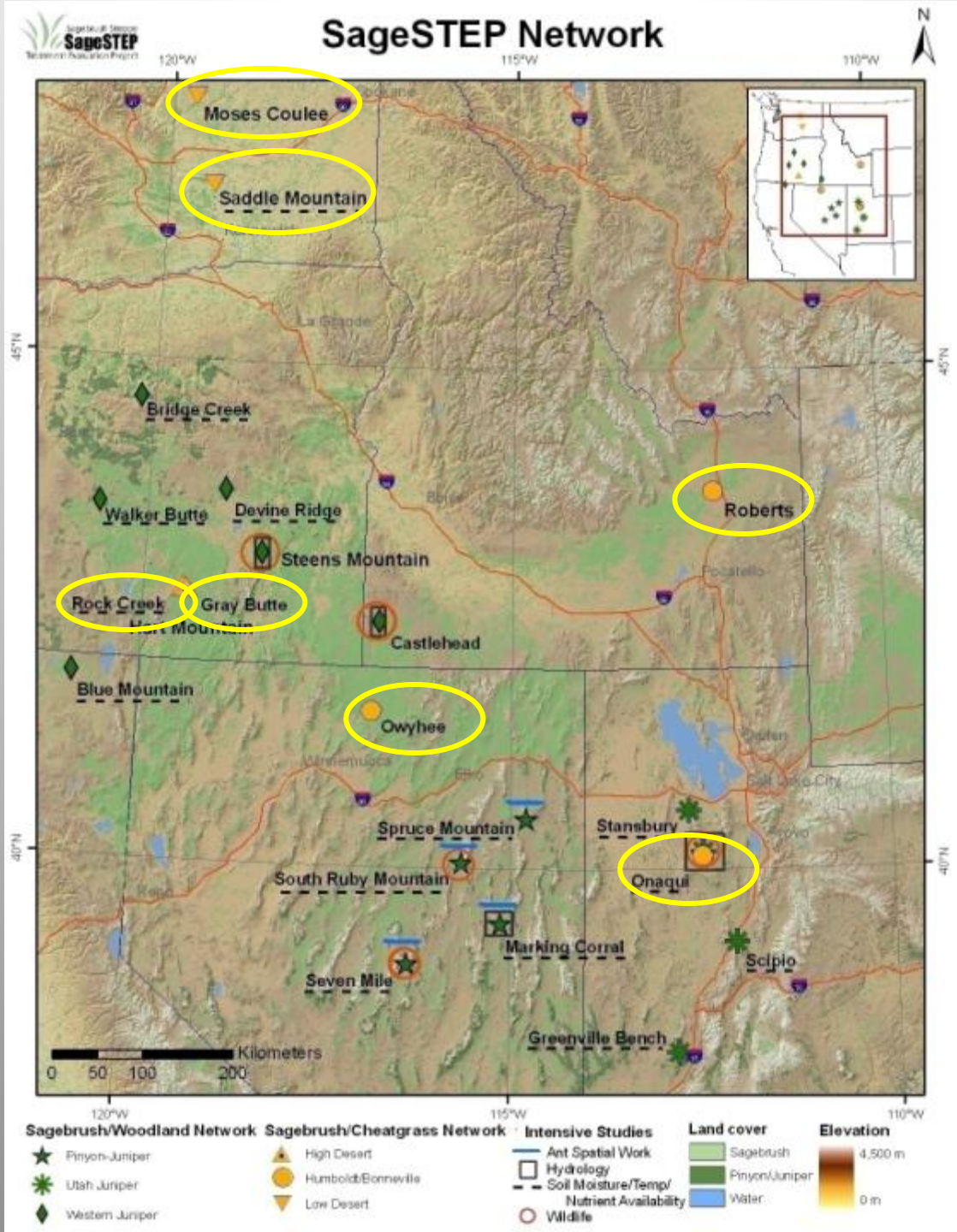
SageSTEP Network
N
120°W
115°W
110°W
45°N
40°N
Moses Coulee
Saddle Mountain
Bridge Creek
Walker Butte
Devine Ridge
Steens Mountain
Rock Creek
Gray Butte
Castlehead
Blue Mountain
Owyhee
Roberts
Spruce Mountain
Stansbury
South Ruby Mountain
Onaqui
Marking Corral
Scipio
Seven Mile
Greenville Bench
Kilometers
0 50 100 200
Sagebrush/Woodland Network
Pinyon-Juniper
Utah Juniper
Western Juniper
Sagebrush/Cheatgrass Network
High Desert
Humboldt/Bonneville
Low Desert
Intensive Studies
Ant Spatial Work
Hydrology
Soil Moisture/Temp/
Nutrient Availability
Wildlife
Land cover
Sagebrush
Pinyon/Juniper
Water
Elevation
4,500 m
0 m

Research Questions & Preliminary Results

What plant community elements change with fuel treatments?

How does the annual herbicide Plateau influence response to treatment?

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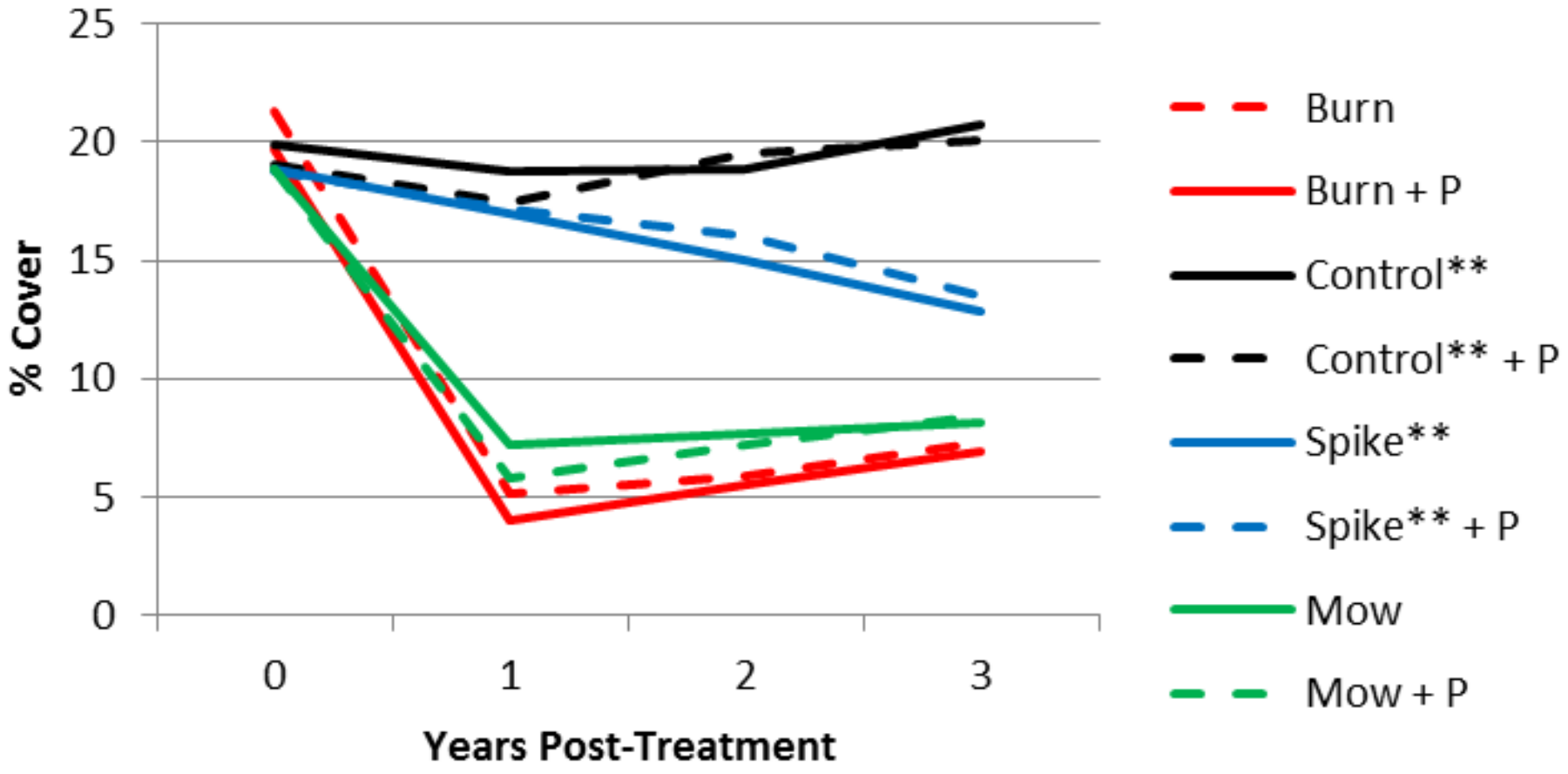
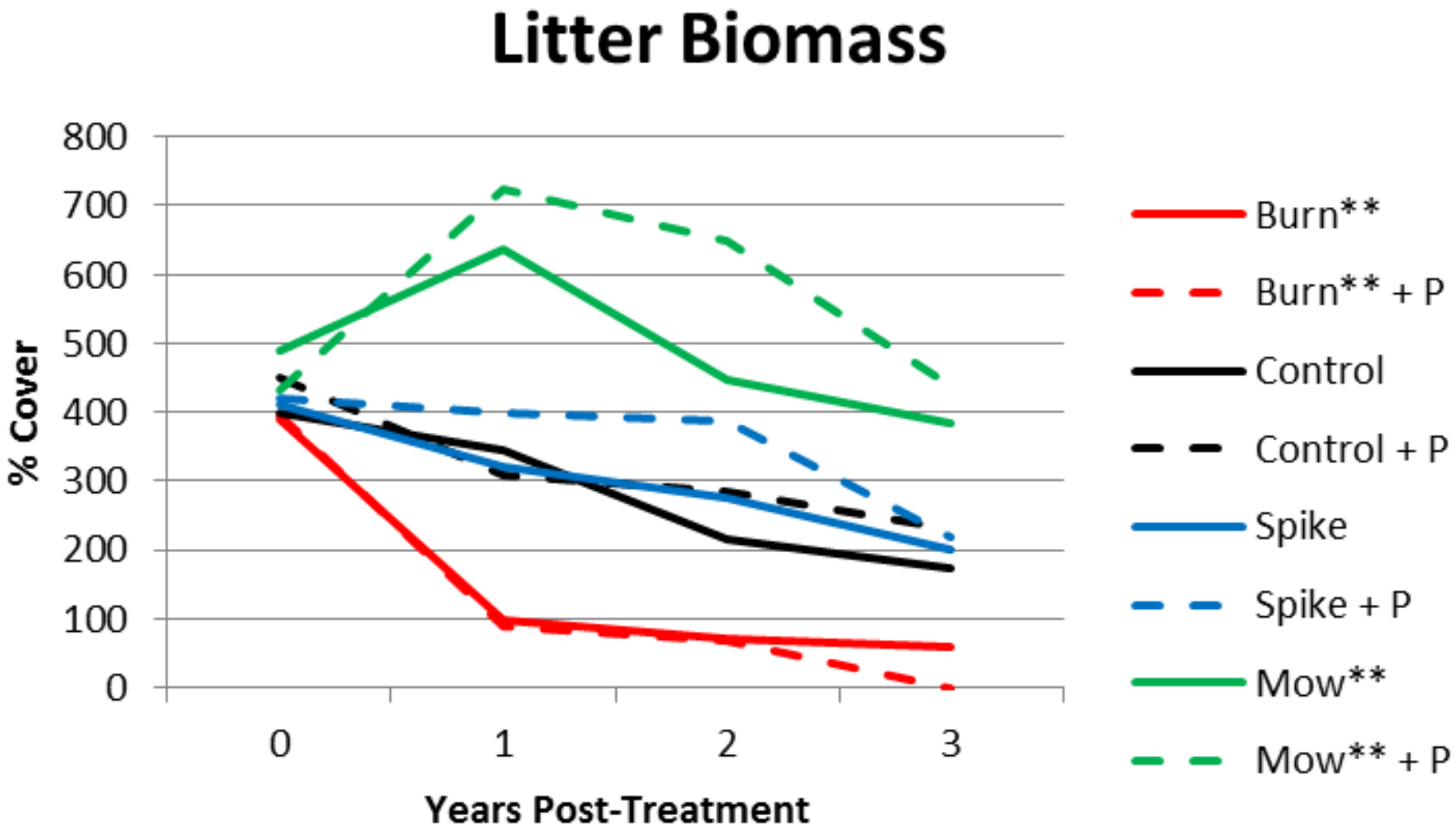
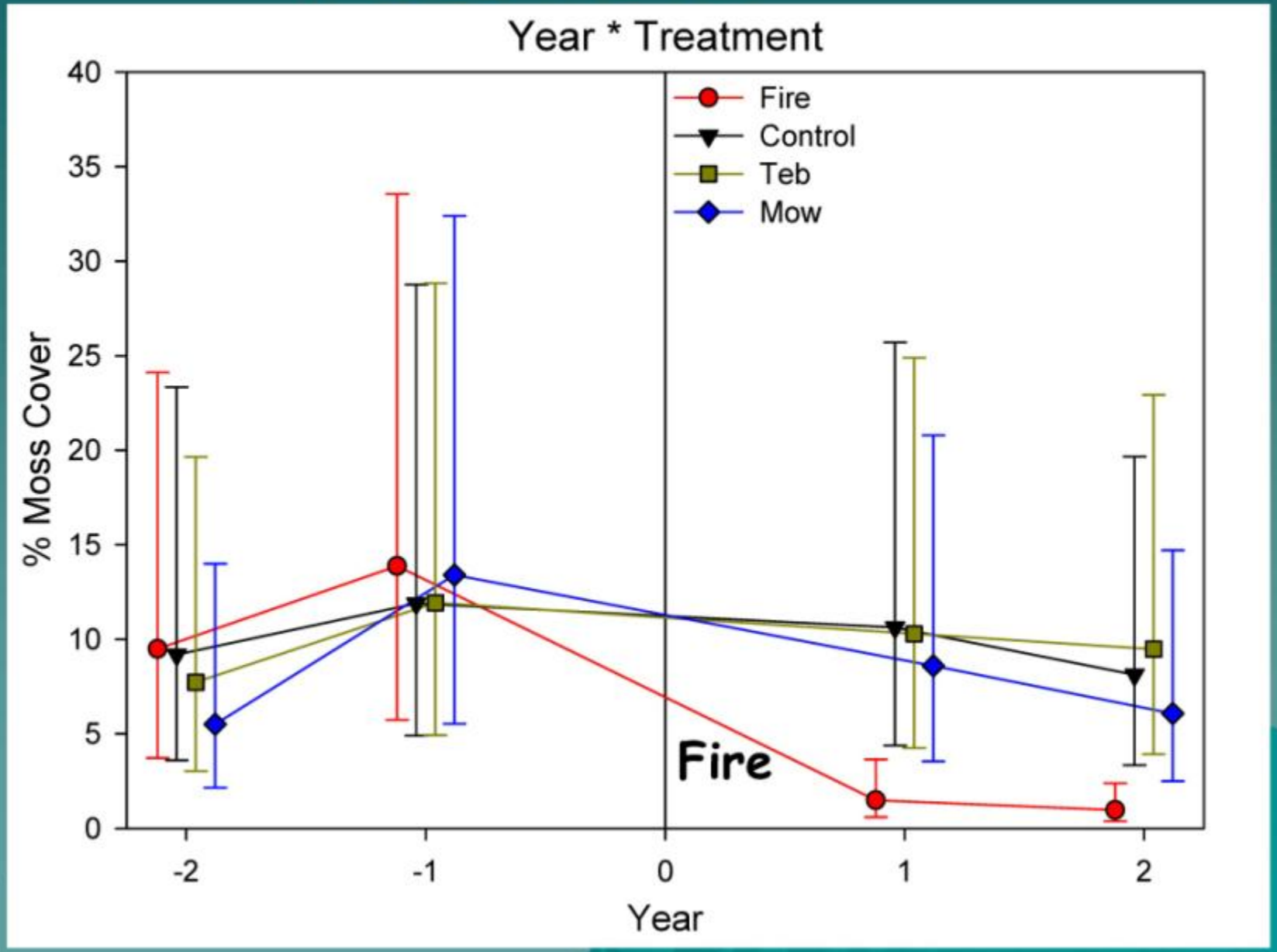
Wyoming Big Sagebrush




Litter Biomass
800
700
600
500
400
300
200
100
0
% Cover
0
1
2
3
Years Post-Treatment
Burn**
Burn** + P
Control
Control + P
Spike
Spike + P
Mow**
Mow** + P

Moss Cover



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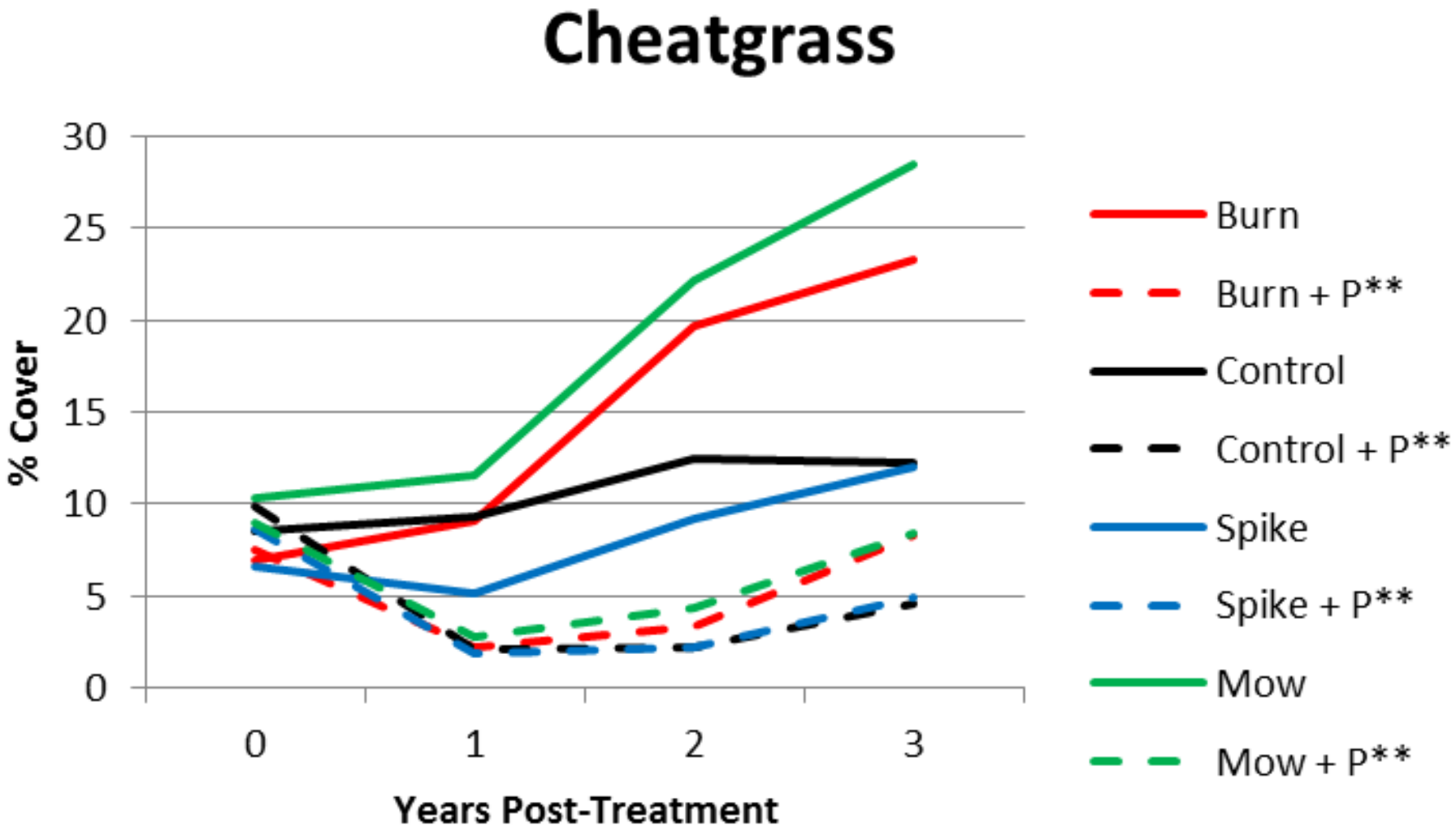
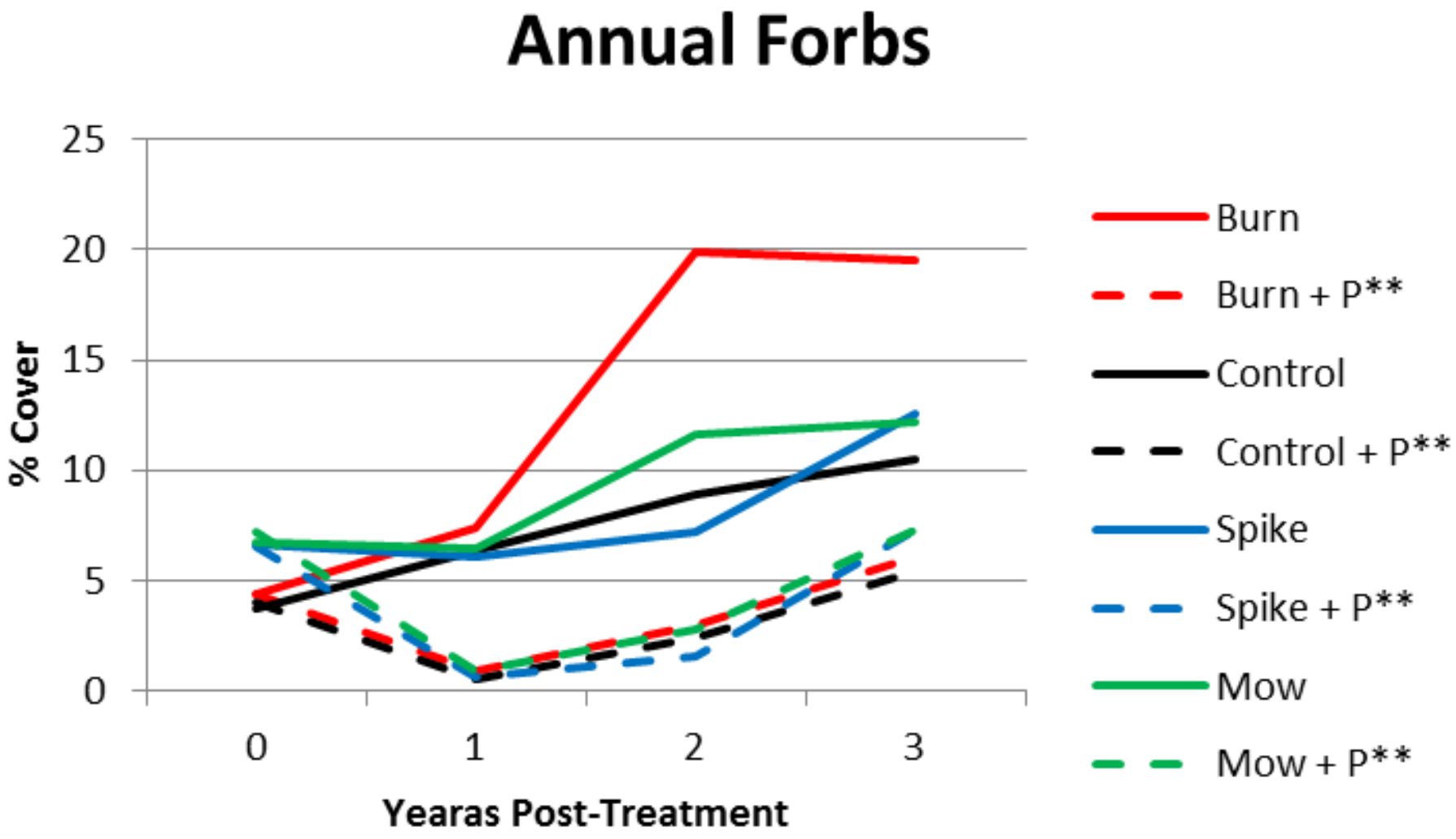
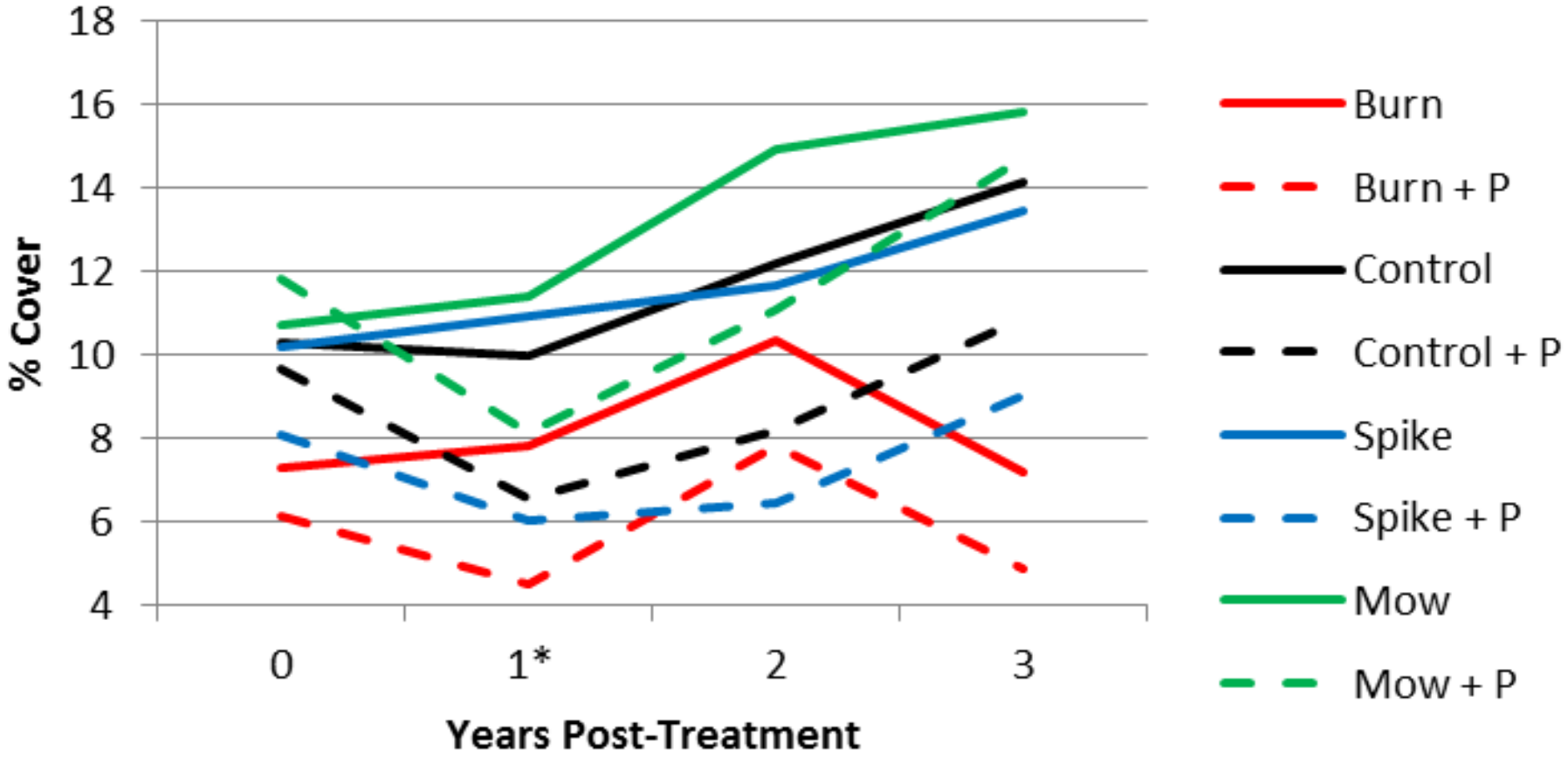

Cheatgrass
% Cover
30
25
20
15
10
5
0
0
1
2
3
Years Post-Treatment
Burn
Burn + P**
Control
Control + P**
Spike
Spike + P**
Mow
Mow + P**

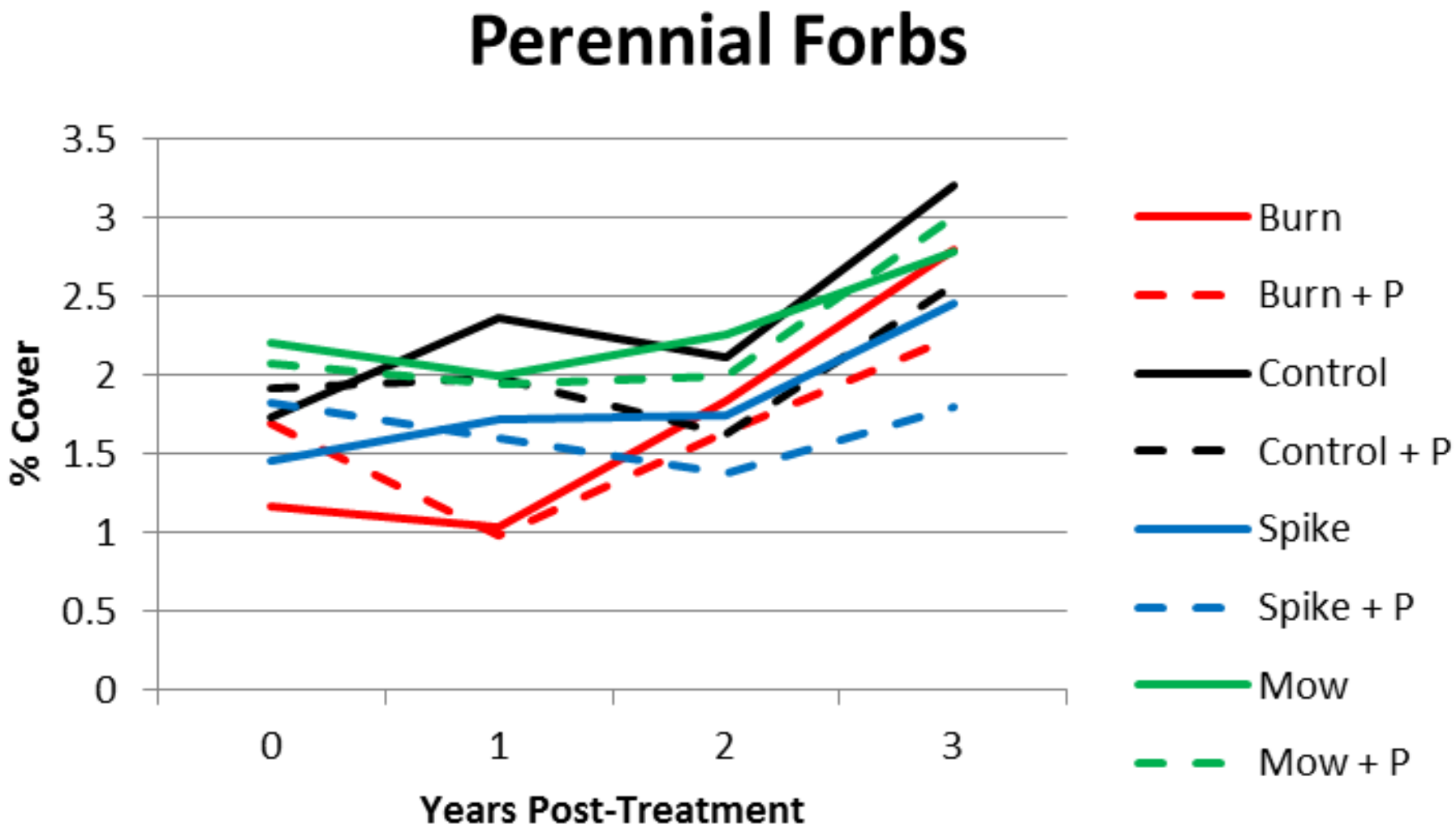
Roberts sage-cheat
Mow 206
7/08/09 T-15/0m
ROBERTS Site
2 Years After Burning
No Plateau

Roberts sage-cheat
Mow-Plateau 265
7/08/09 T-15/0m
ROBERTS Site
2 Years After Burning
+ Plateau

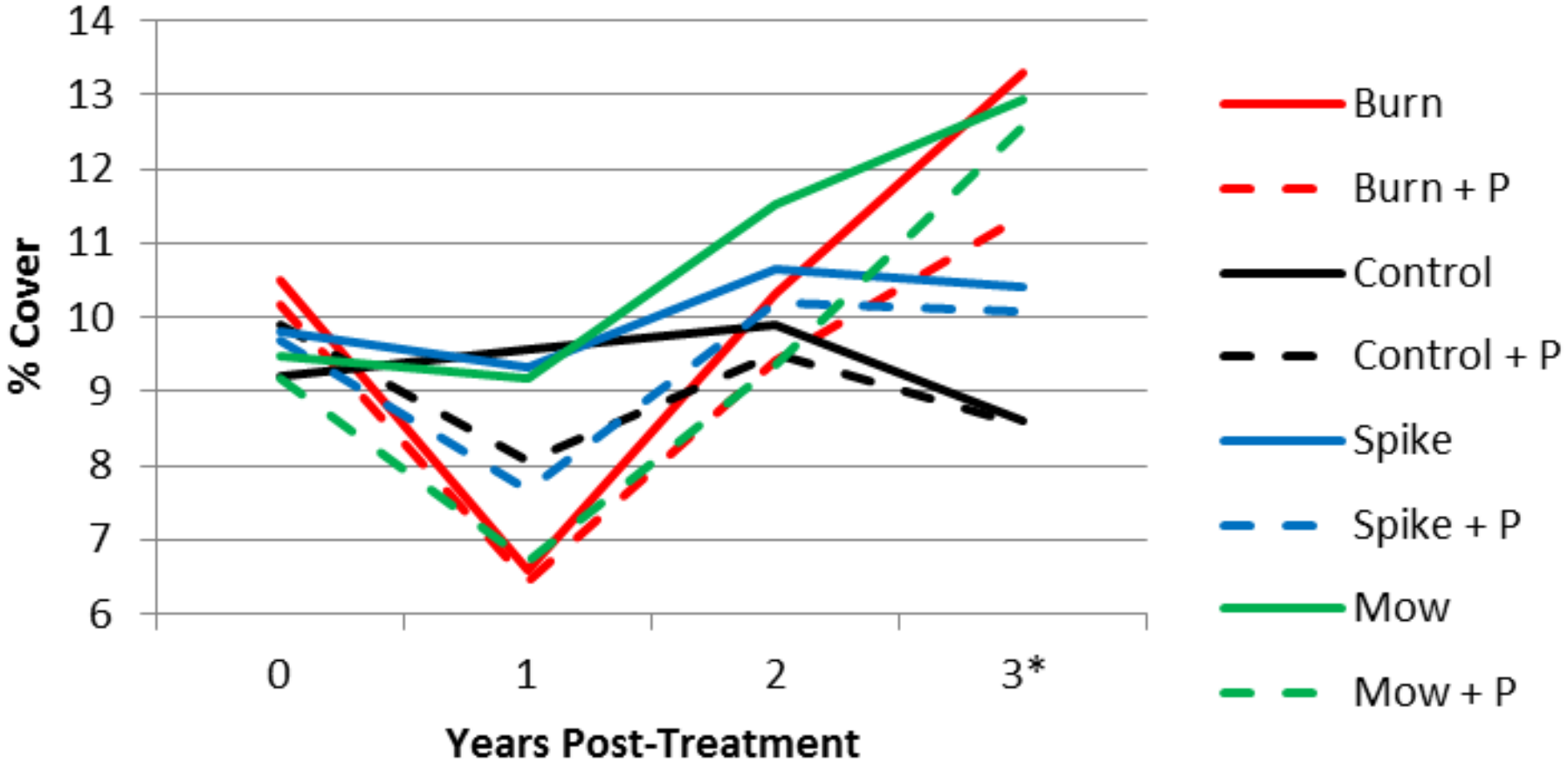

Annual Forbs
25
20
15
10
5
0
% Cover
0
1
2
3
Yearas Post-Treatment
Burn
Burn + P**
Control
Control + P**
Spike
Spike + P**
Mow
Mow + P**

Perennial Grasses (Short)

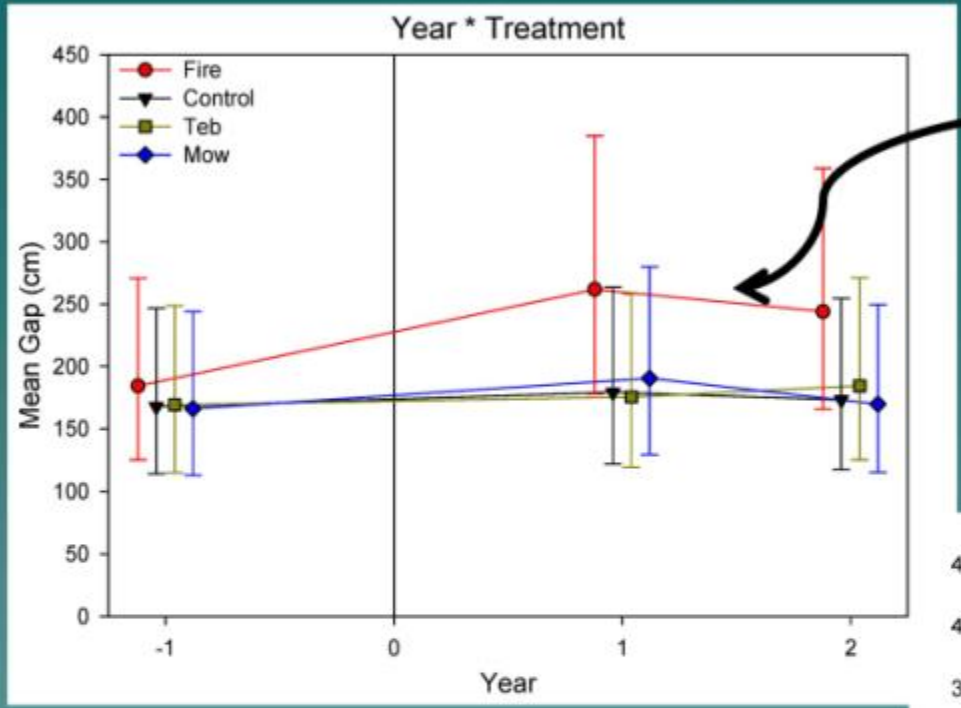



Perennial Forbs
3.5
3
2.5
2
1.5
1
0.5
0
% Cover
0
1
2
3
Years Post-Treatment
Burn
Burn + P
Control
Control + P
Spike
Spike + P
Mow
Mow + P

Perennial Grasses (Tall)

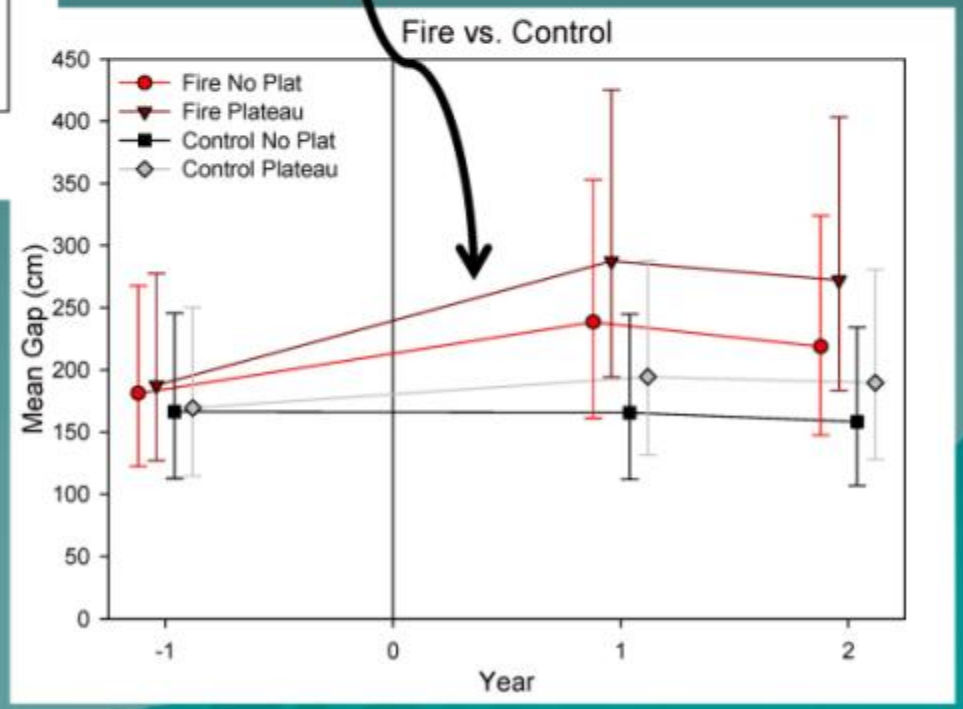


Basal Gaps by Treatment



Fire

Fire + Plateau



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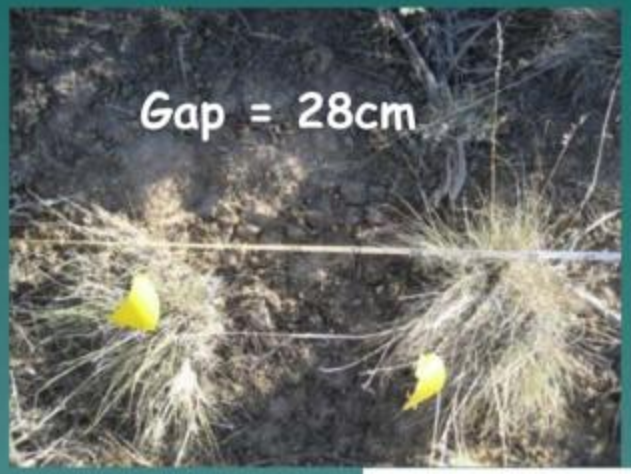
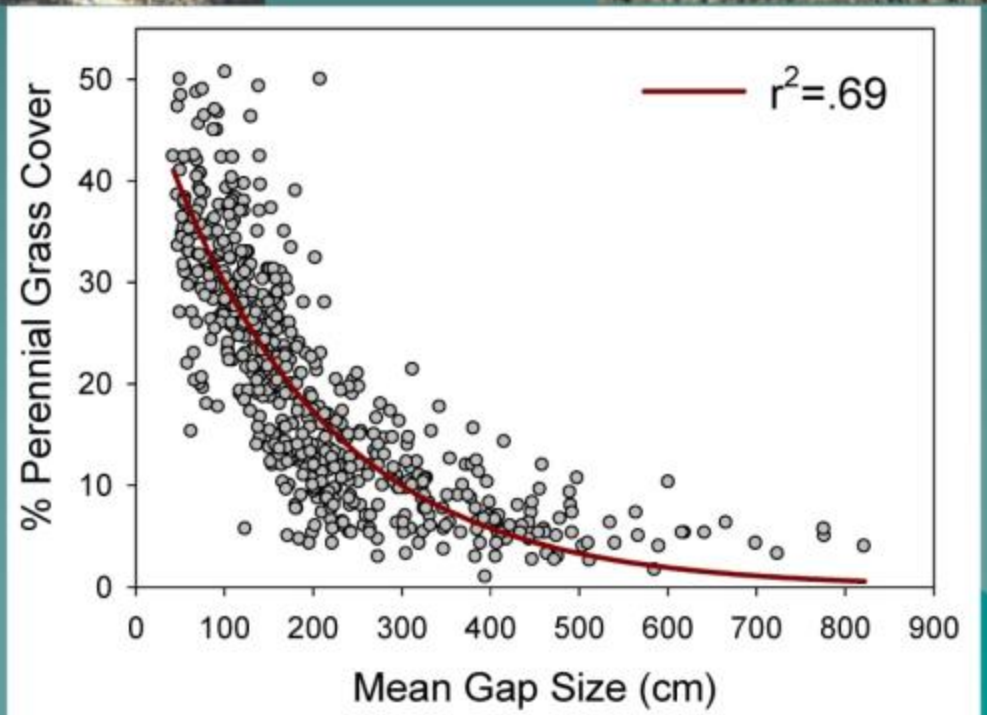
Basal Gap Size vs. Perennial Grass Cover





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Fuel Treatment Preliminary Conclusions

Decreases

- Fire
  - Shrubs
  - Perennial grasses
  - Mosses, Litter
- Mowing
  - Shrubs
- Plateau
  - Cheatgrass
  - Perennial grasses
  - Annual forbs

Increases

- Fire
  - Basal gap size
  - Bare ground
- Mowing
  - Cheatgrass
  - Perennial grasses
- Plateau & Fire
  - Bare ground
  - Basal gap size

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sagestep.org

- Funding:
  - USDA-USDI Joint Fire Sciences Program
  - US Geological Survey
  - Oregon State University & Utah State University
- Treatment Applications
  - BLM, USFWS, & USGS
- Site Selection
  - BLM, USFWS, BOR, TNC, & USFS
- Housing
  - USFWS, TNC, USDA ARS NGBER
- Field Assistants
  - Field crew members with USGS, OSU & USU

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