

Experiments in Meadow Restoration at Bunchgrass Ridge

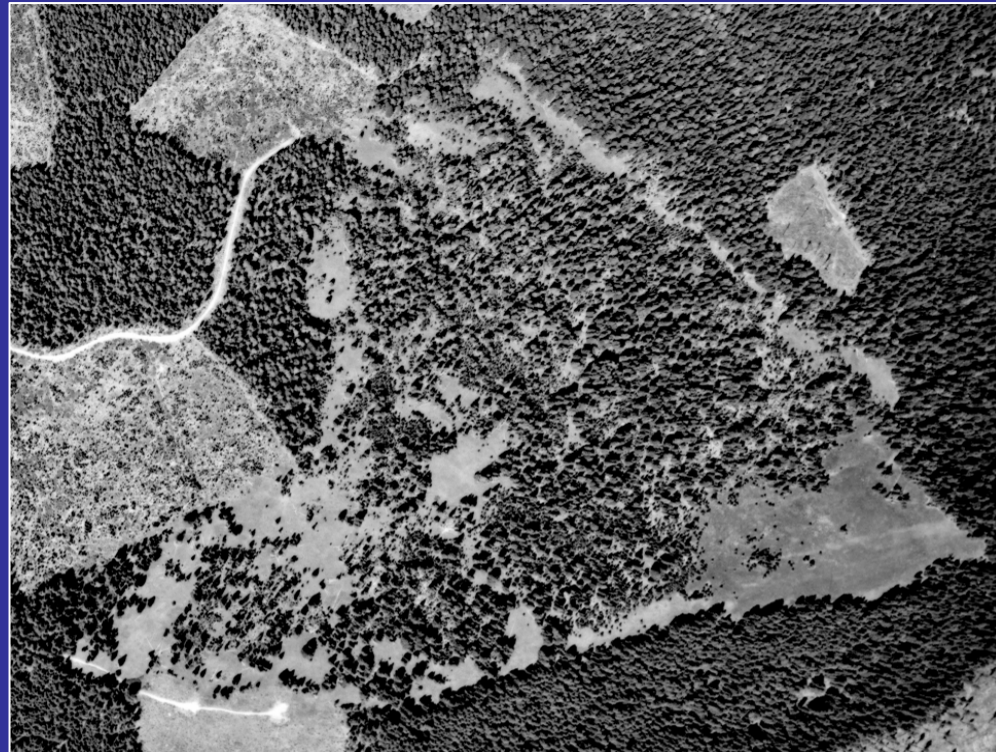


Problem: 20th Century Tree Encroachment

1959



1997



Challenges and Questions

Is meadow restoration possible through tree removal and use of fire?



Challenges and Questions

Is fire necessary for restoration ... or is tree removal sufficient?



If fire is not necessary, how do we dispose of slash (piles)?

What are the consequences of pile burning?

Challenges and Questions

Does the potential for restoration depend on the extent to which tree invasion has progressed?



10 yr

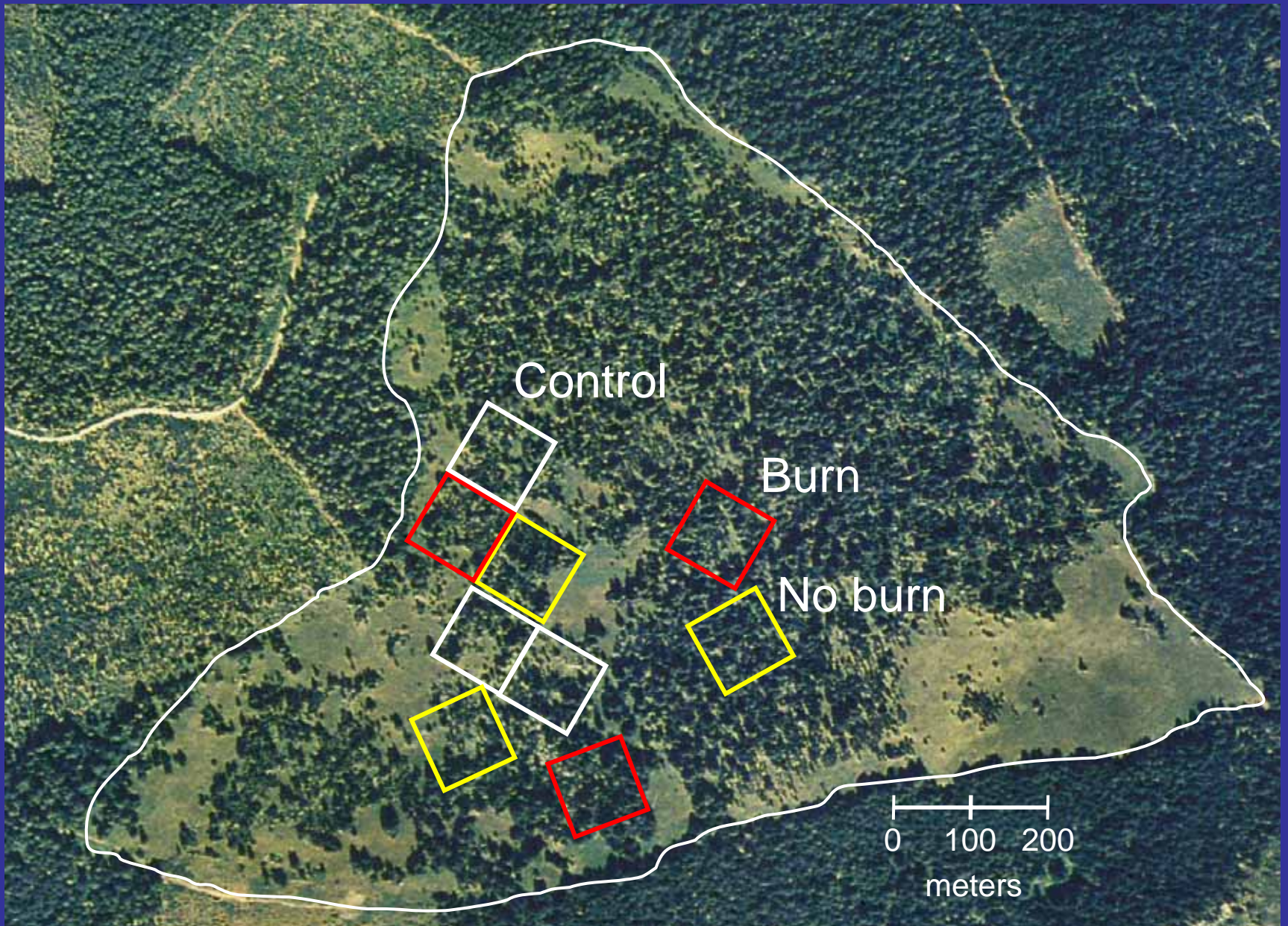


30-50 yr



100+ yr

Experimental Design



Experimental Design



Control



Tree removal +
No burn (pile burn)



Tree removal +
Burn (broadcast)



Is fire necessary for restoration?

Tree Removal



Felling and yarding on snow, Jan-Feb 2006

Burn Treatments

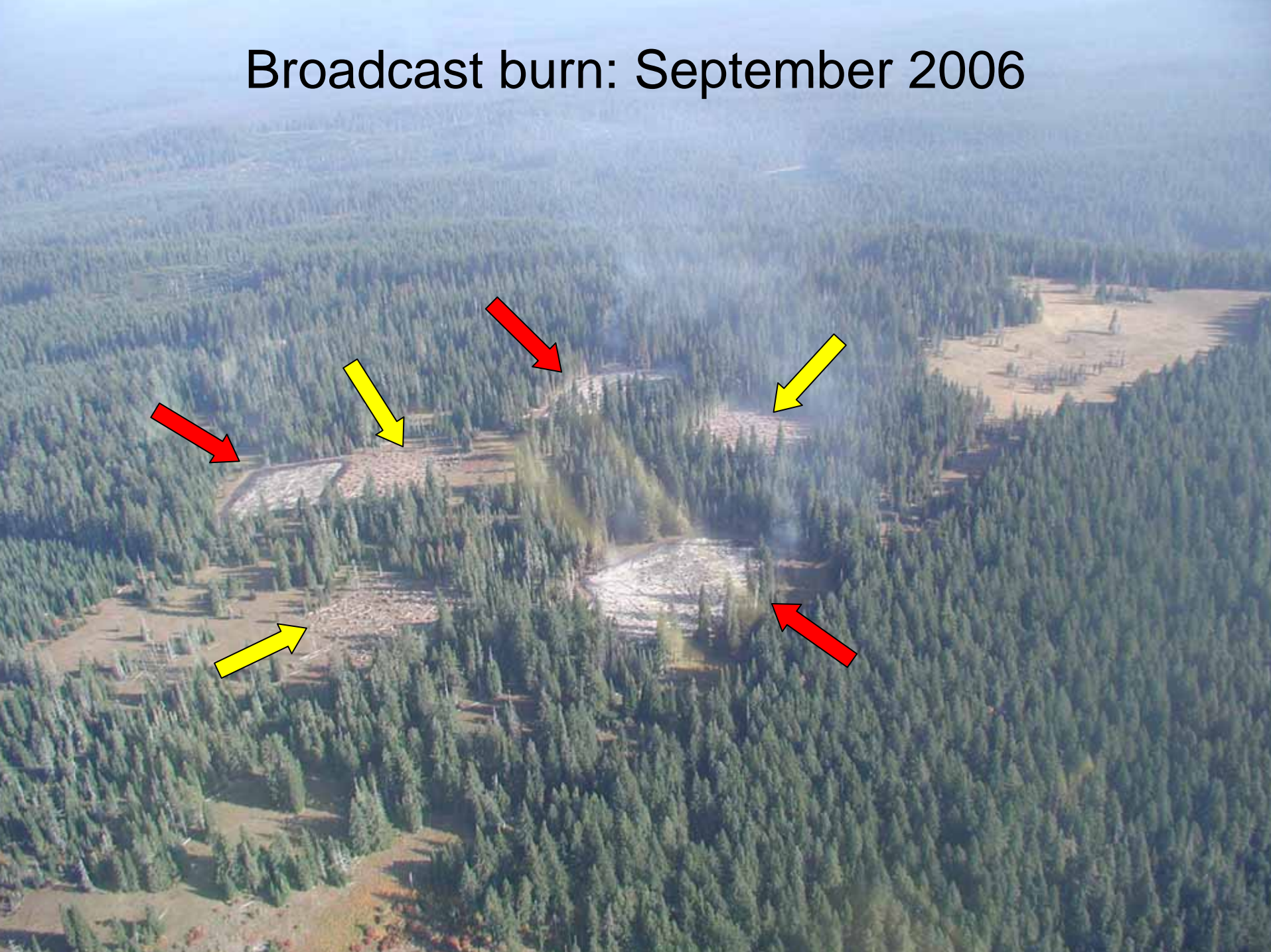


Broadcast burn, Sept 2006



Piles burned, Nov 2006

Broadcast burn: September 2006



Pile burn: November 2006



Post-treatment Conditions

Broadcast burn



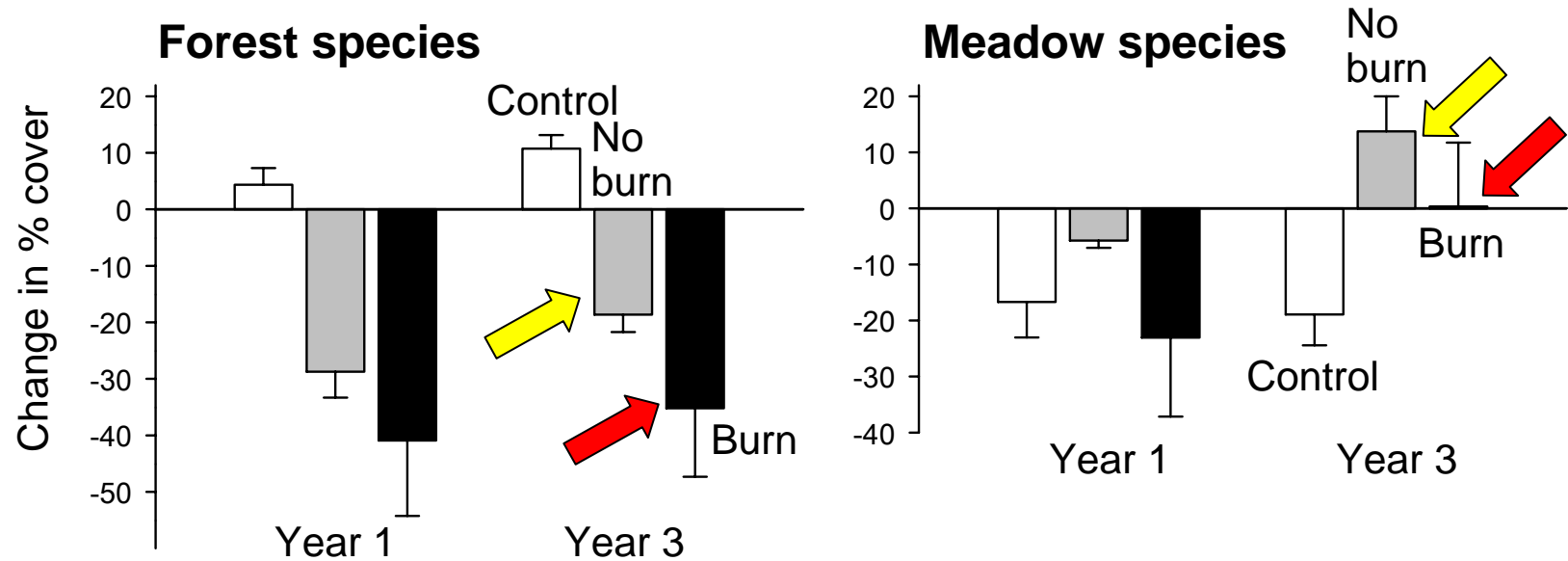
Burn pile scar

Measure of Success?

Replacement of “forest understory” by “meadow” species



Results: Cover of Forest and Meadow Species



Control

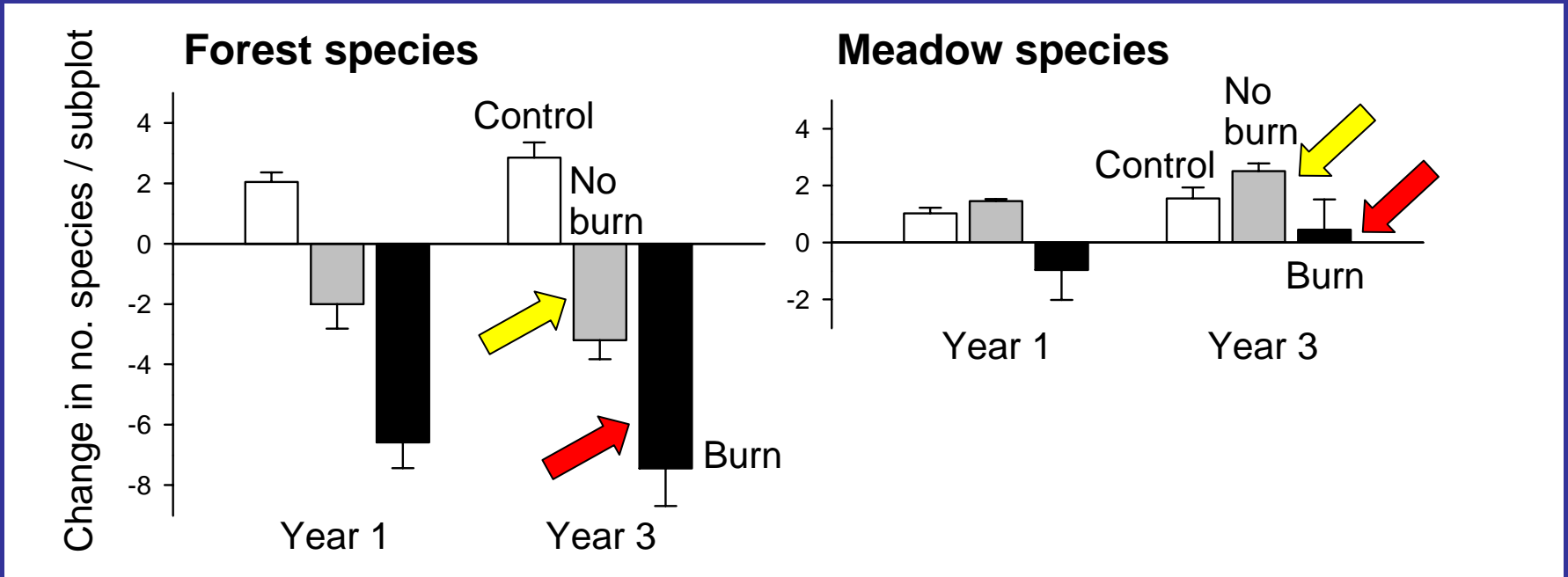


No burn (pile burn)



Burn (broadcast)

Results: Diversity of Forest and Meadow Species



Control



No burn (pile burn)



Burn (broadcast)

How Do Things Look on the Ground?



Year 1

Broadcast burn

Year 3



How Do Things Look on the Ground?



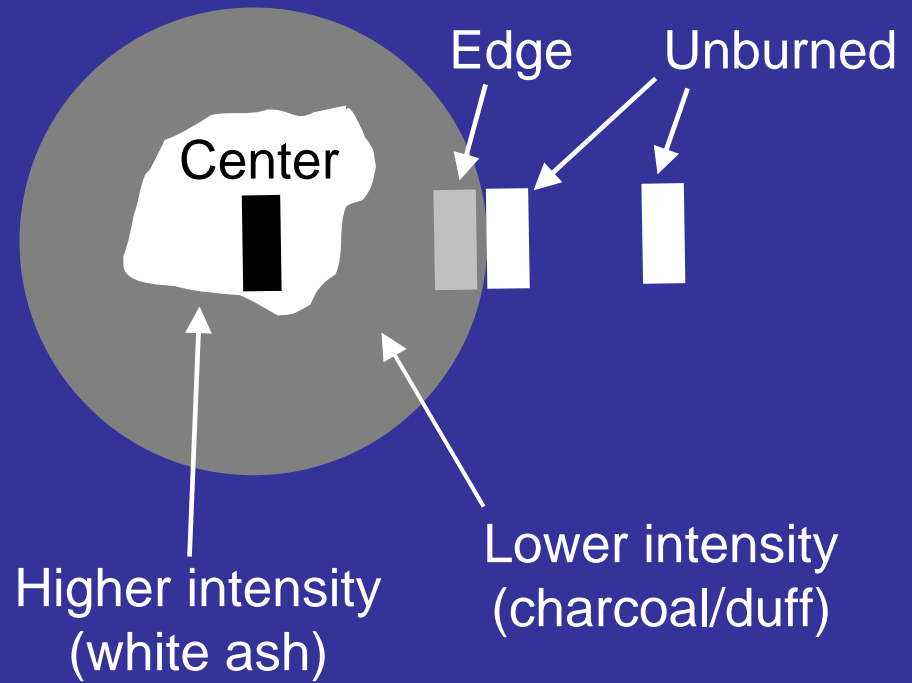
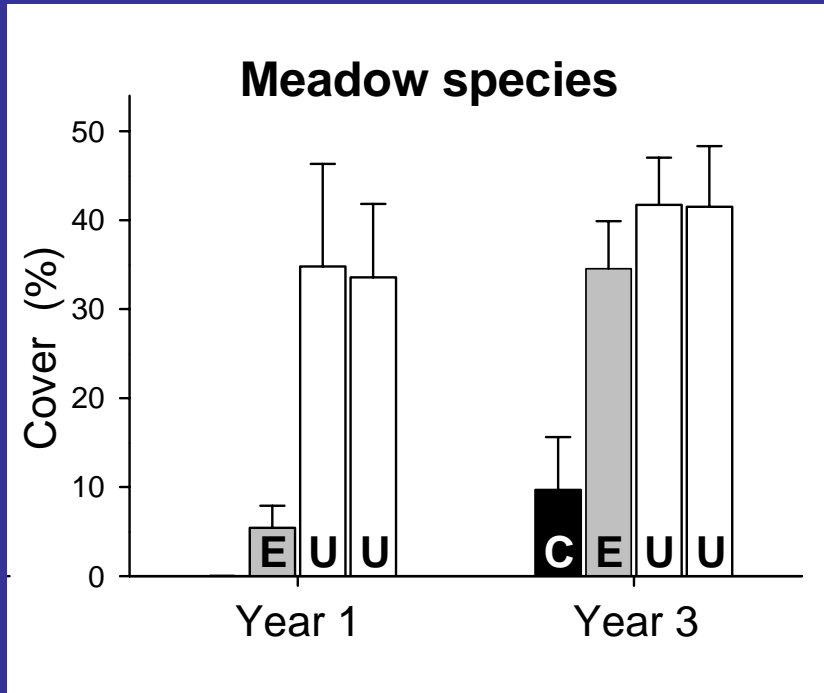
Year 1

No burn (pile burn)

Year 3



Results: Recovery of Burn Piles



How Do Things Look on the Ground?



Year 1

Burn scars

Year 3



gophers



Conclusions

Q. Is restoration possible?

A. Yes. Tree removal with or without burning benefits meadow species at the expense of forest species.

Q. Is fire necessary?

A. No, but burning is more detrimental to forest species than canopy removal alone.

Q. What are the consequences of pile burning?

A. Burn scars show rapid recovery and are short-lived disturbances that are “erased” by the soil-mixing activities of gophers.

Q. Does potential for restoration depend on the extent to which tree invasion has progressed?

A. Yes, but even in the oldest forests treated, responses were positive.

Future of Bunchgrass?

