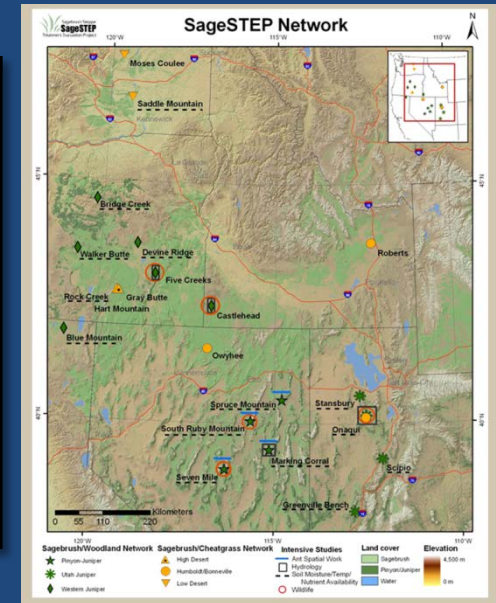
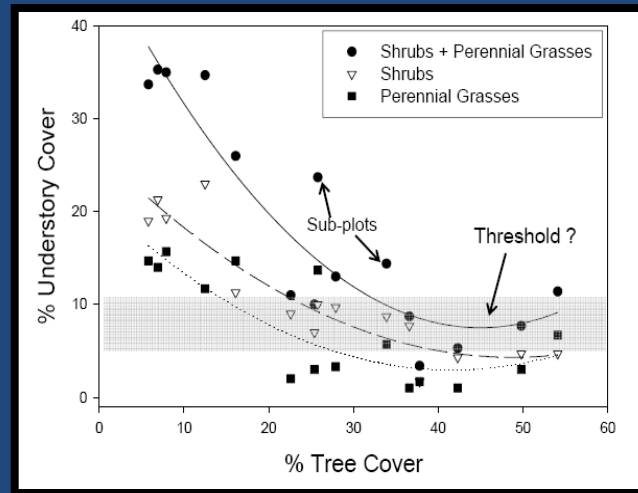




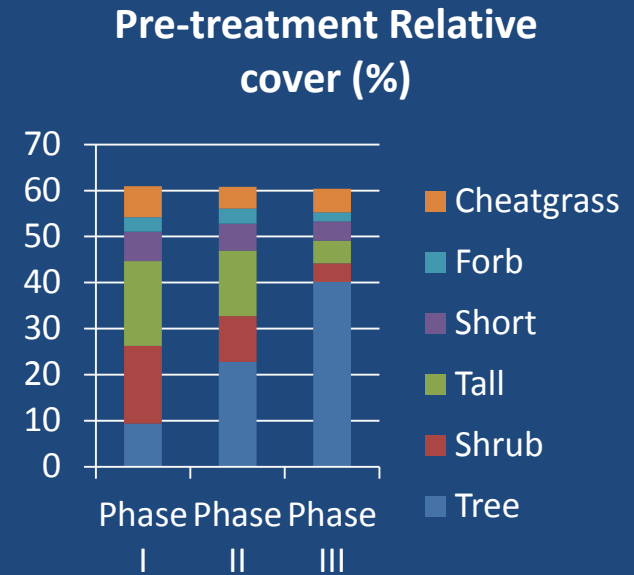
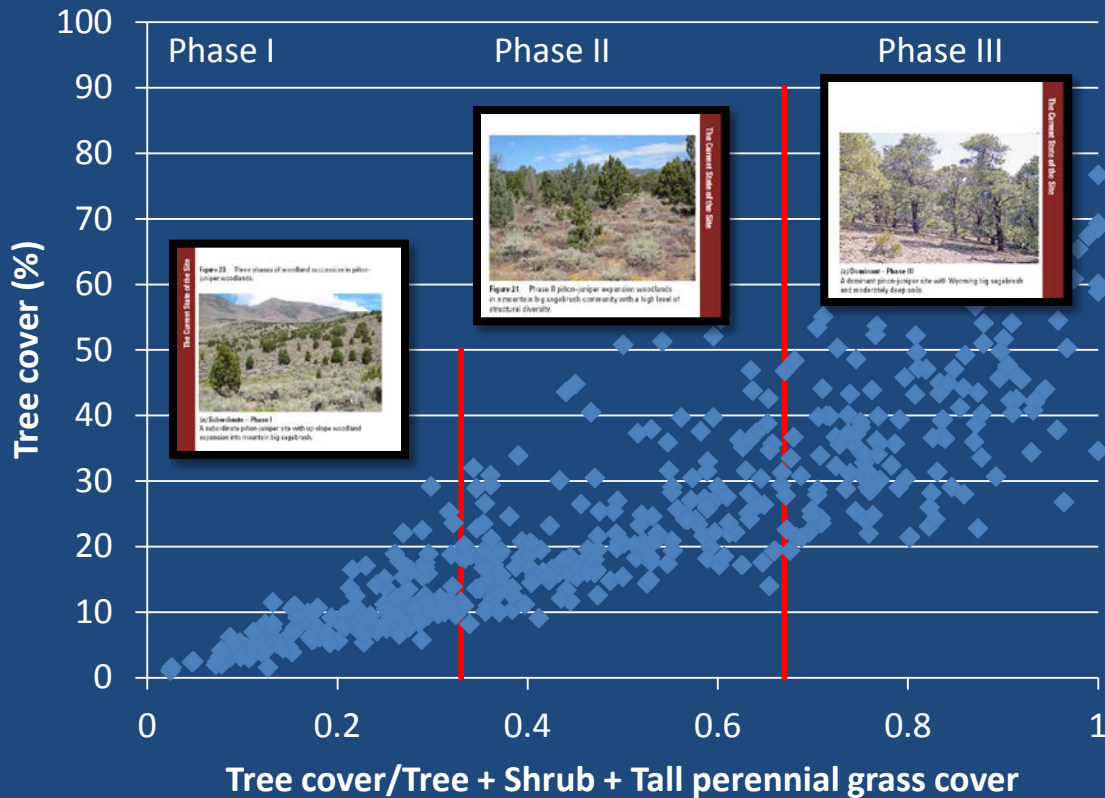
Effectiveness of Fuel Control Treatments In Wooded Shrublands

- How, when, and where we treat

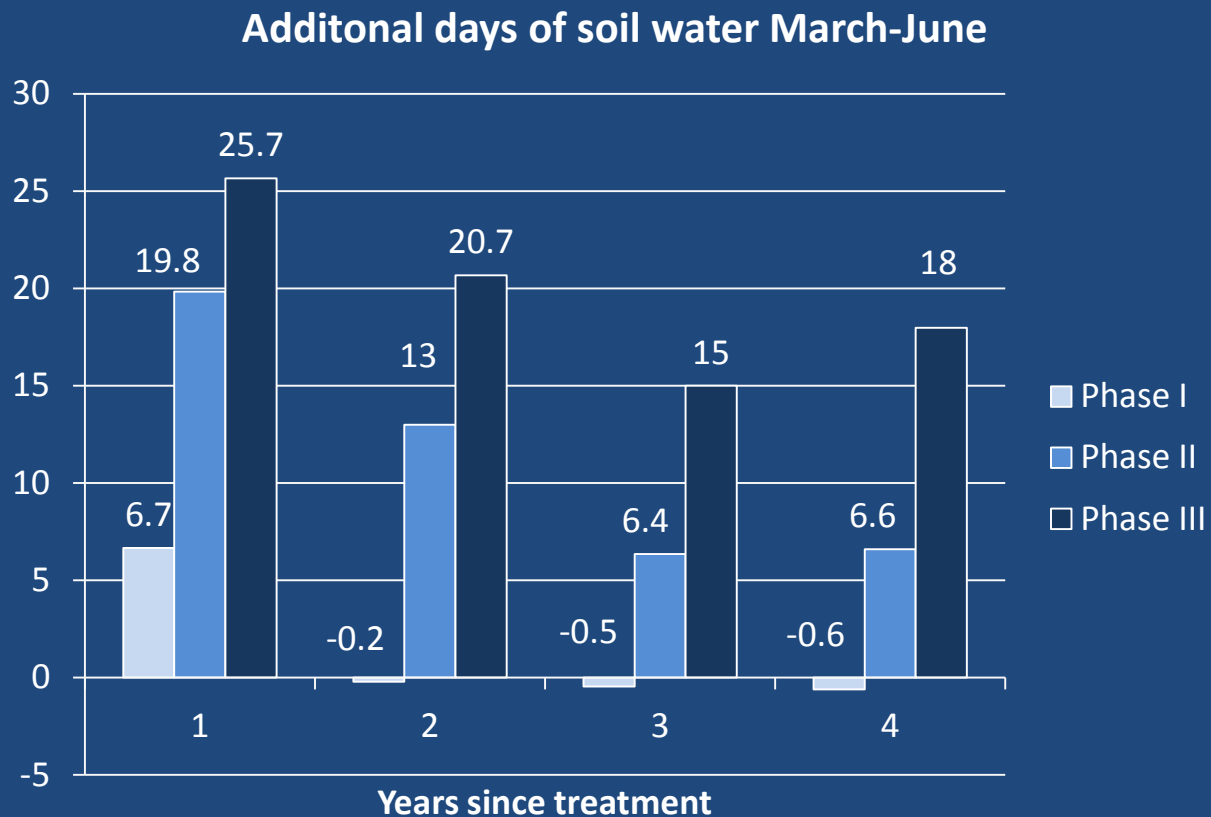
Bruce Roundy, Rick Miller, Robin Tausch, Jeanne Chambers, Kert Young, April Hulet



Phases of invasion: categories along a continuum

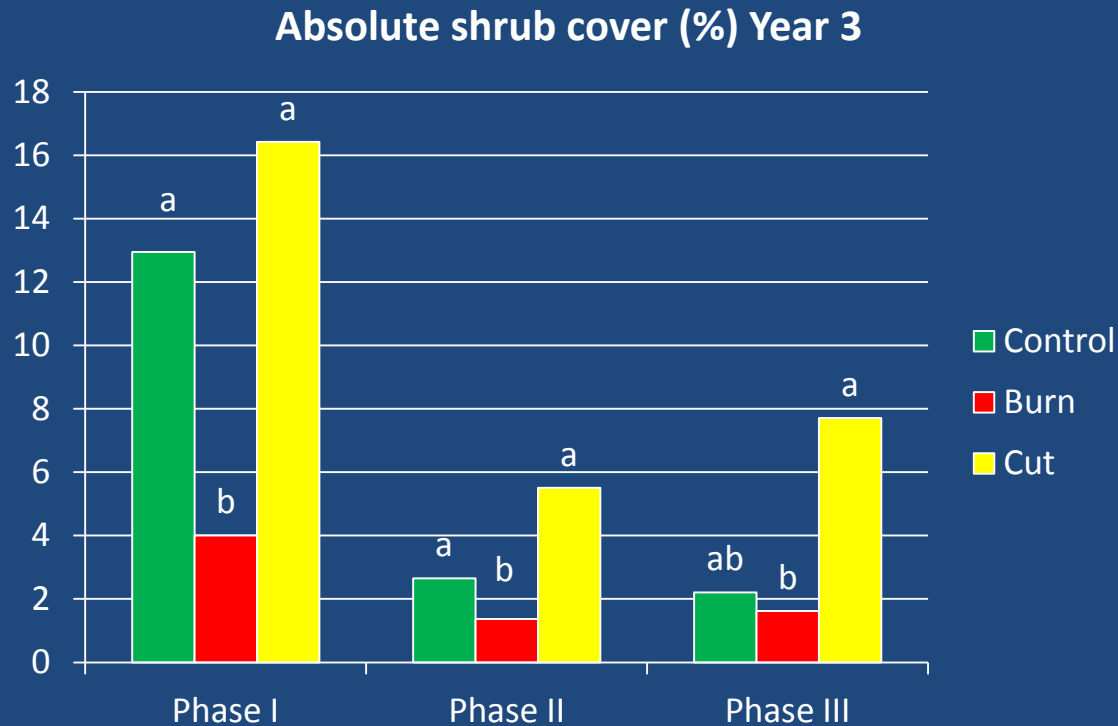


Killing trees increases available soil water



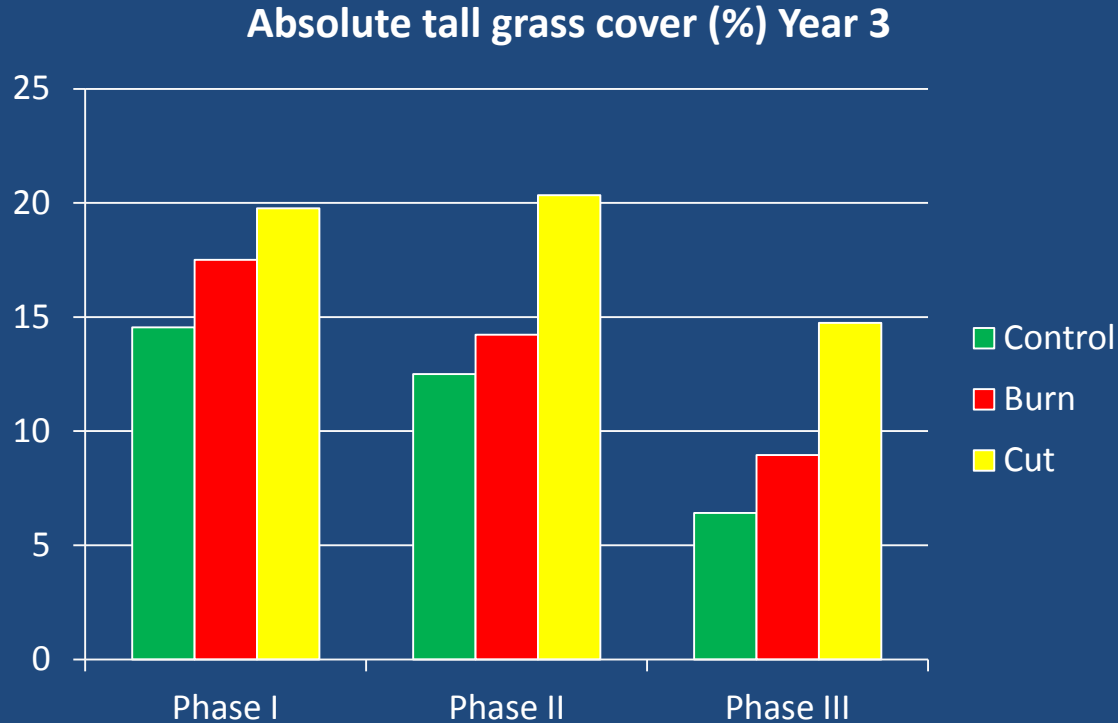
Mechanical leaves shrubs

More to leave in Phase I



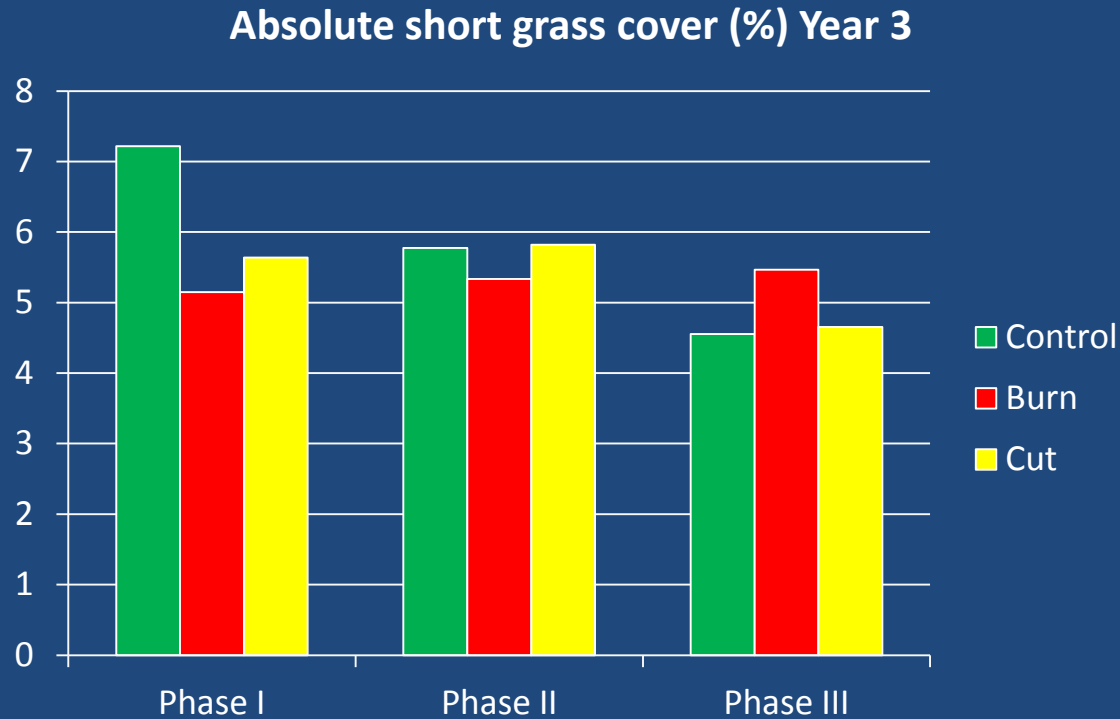
Treatment, Phase , T * P sig

Mechanical benefits tall grasses



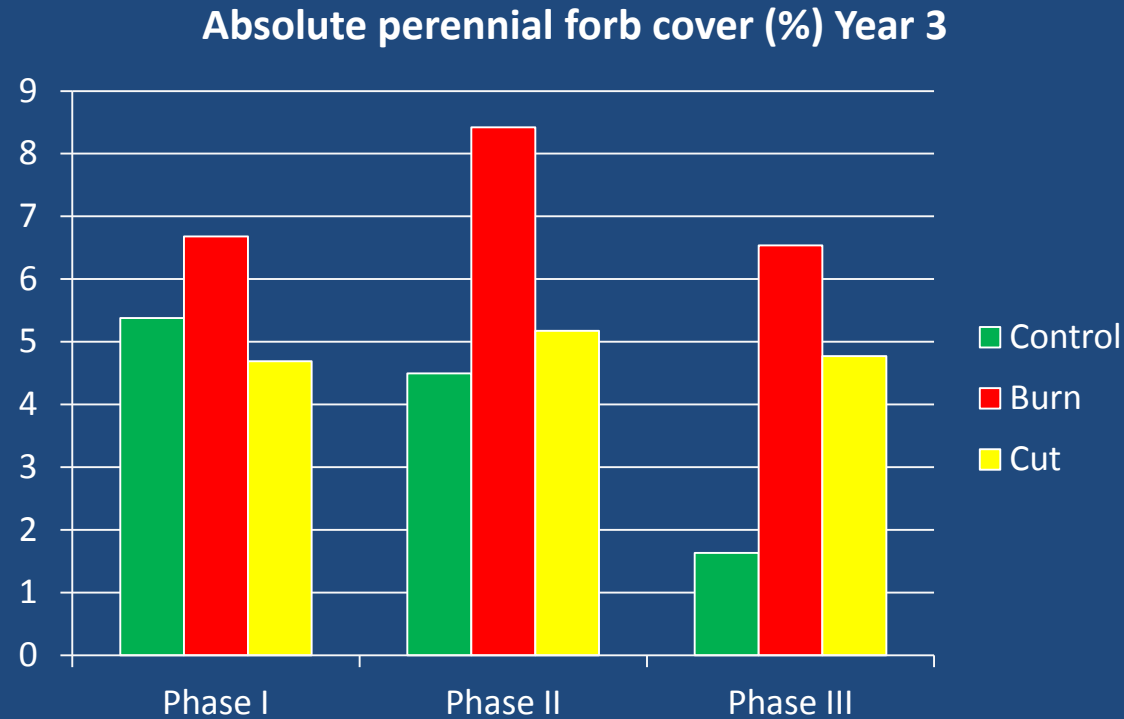
Treatment sig, Cut > Burn = Control

Short grasses less affected



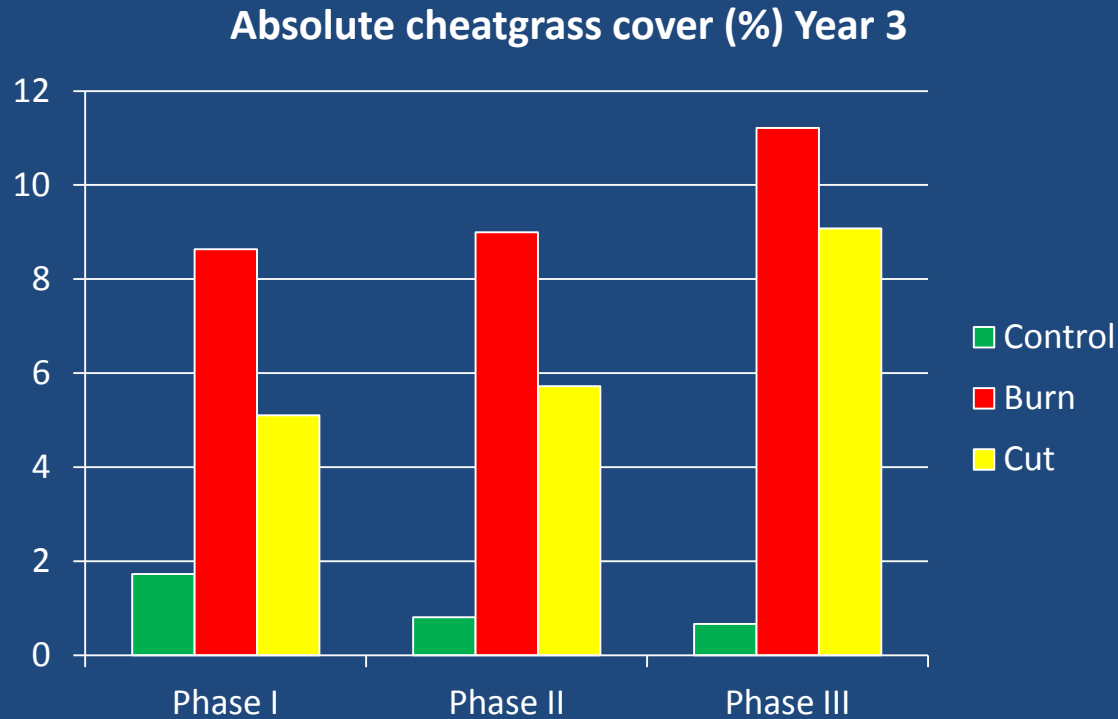
Treatment, Phase, T * P NS

Perennial forbs benefitted by fire at Phase I and II, mechanical at Phase III



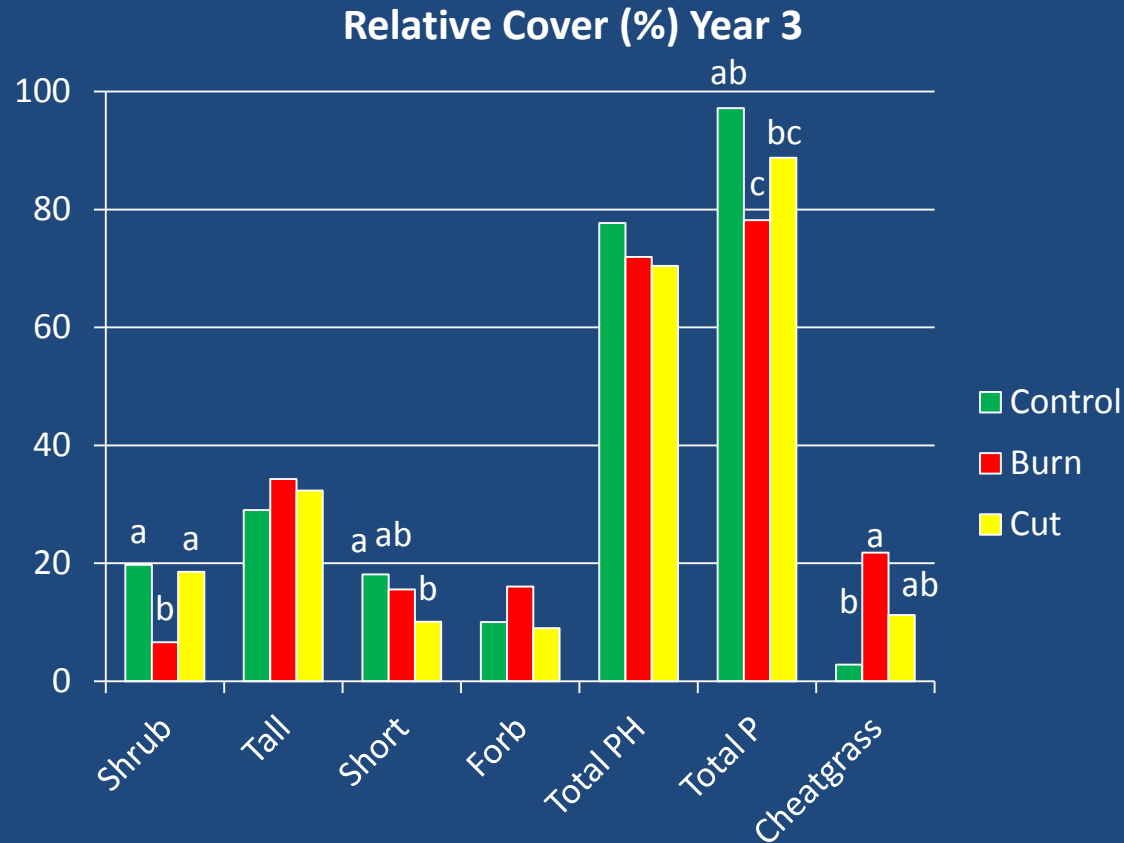
Phase and T * P sig

Cheatgrass benefitted by fire and mechanical



Treatment sig
Burn = Cut > Control

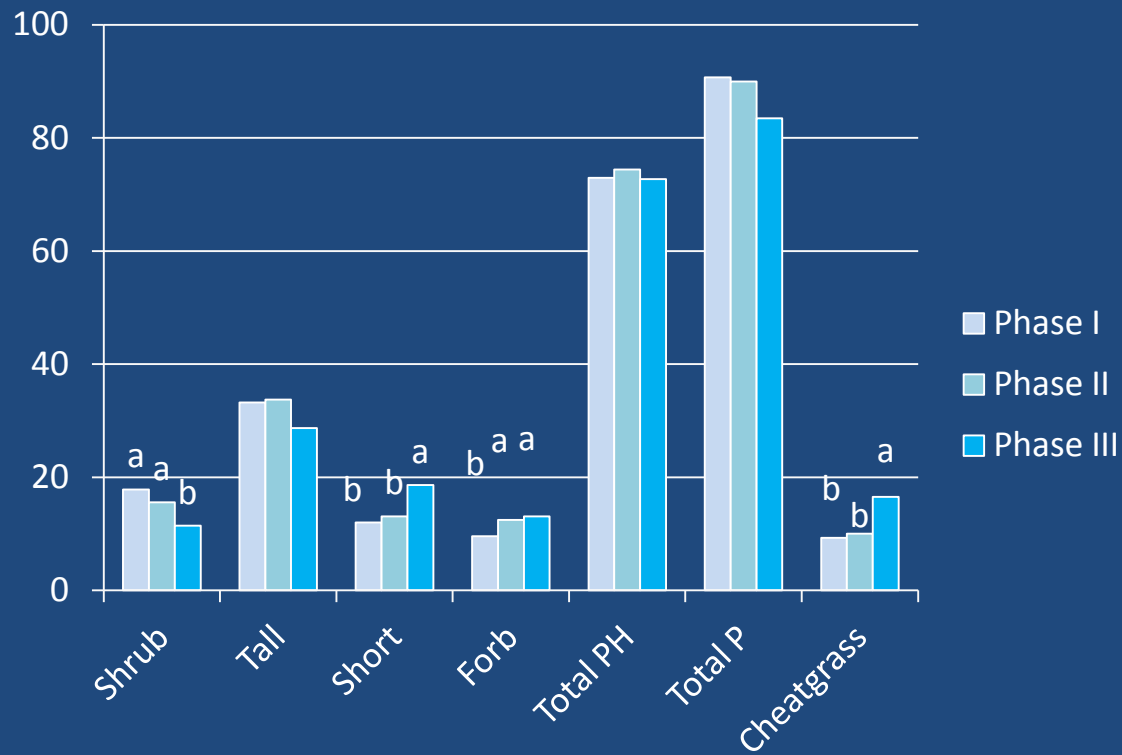
On most sites, perennials dominate



Increasing Phase

Shrubs	-
Tall Grass	same
Short grass	+
Perennial forbs	+
Cheatgrass	+

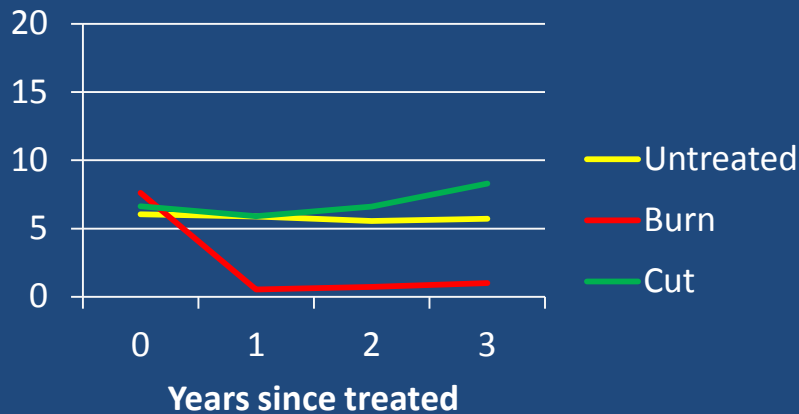
Relative Cover (%) Year 3



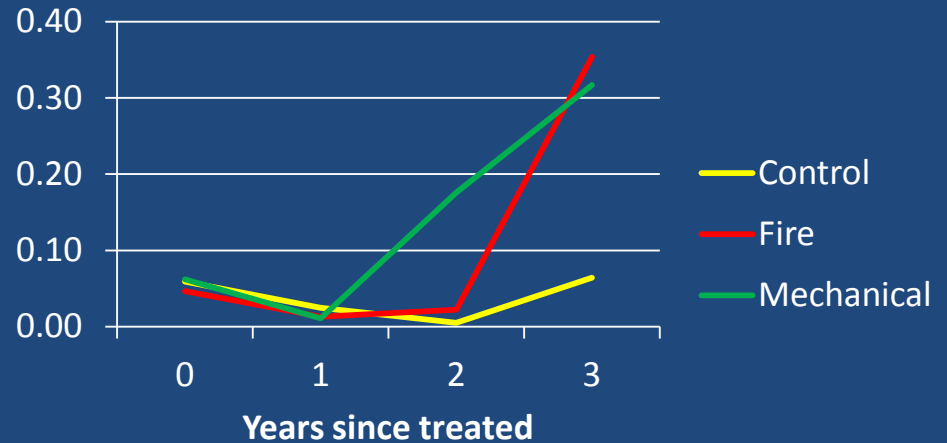
Sagebrush cover and seedlings

Residual trees

Sagebrush cover (%)



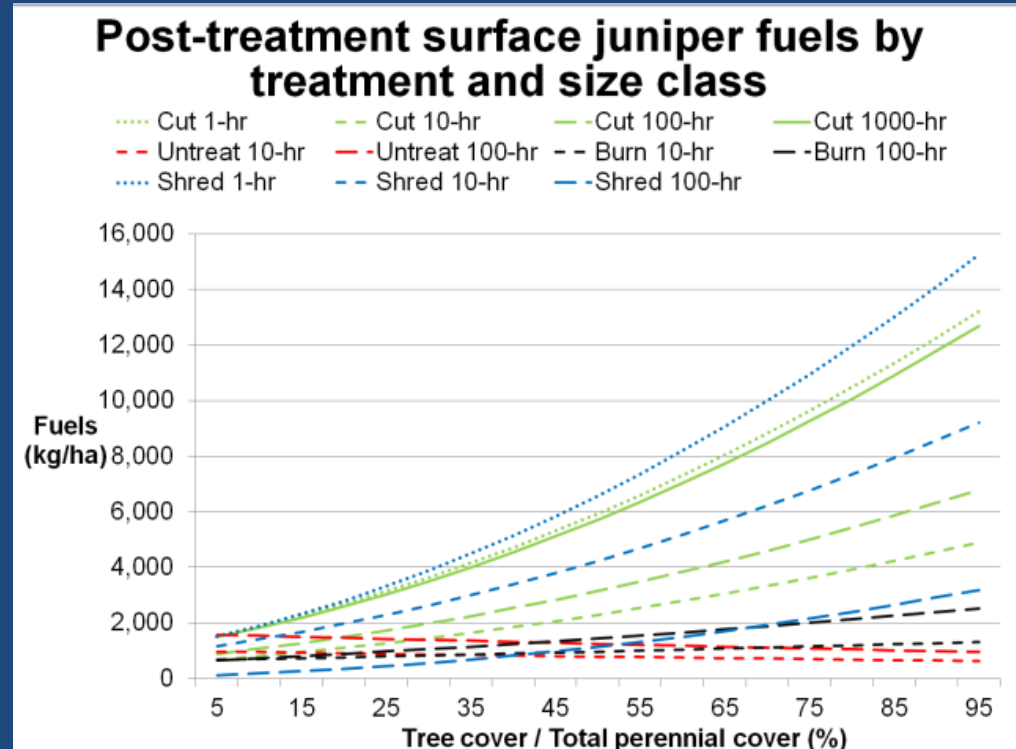
Sagebrush seedlings/m²



Sagebrush seedlings

Woody Surface Fuels

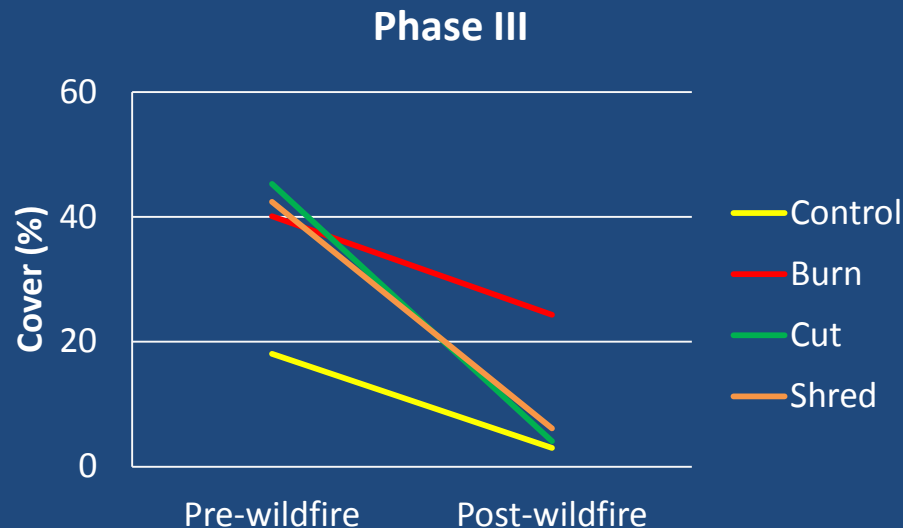
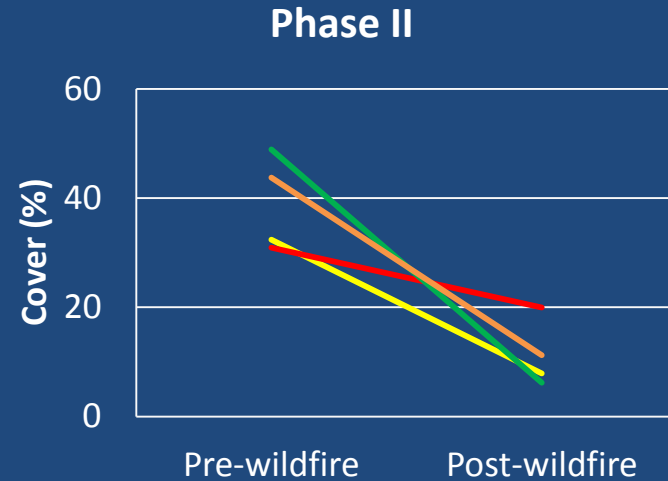
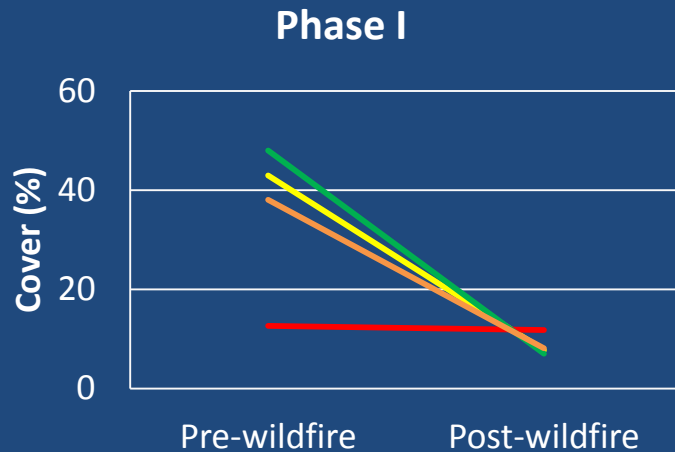
- Burning greatly reduces all
- Cutting greatly increases all surface fuels
- Shredding converts 100 and 1000-hr to 1 and 10-hr fuels



Effects of putting fuels on the ground

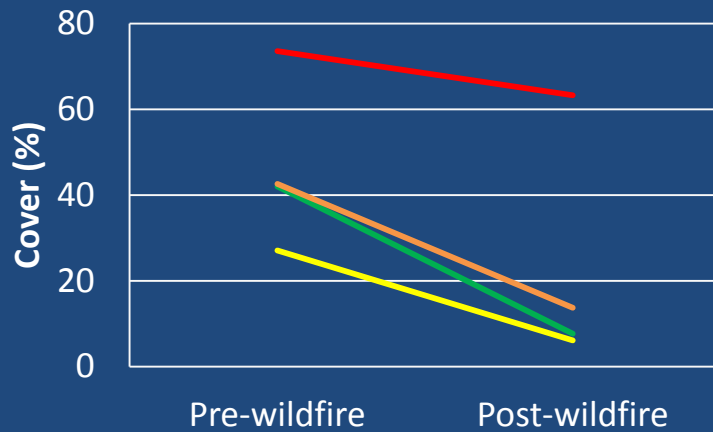


Wildfire decreases perennial grasses less after prescribed fire than after mechanical treatments

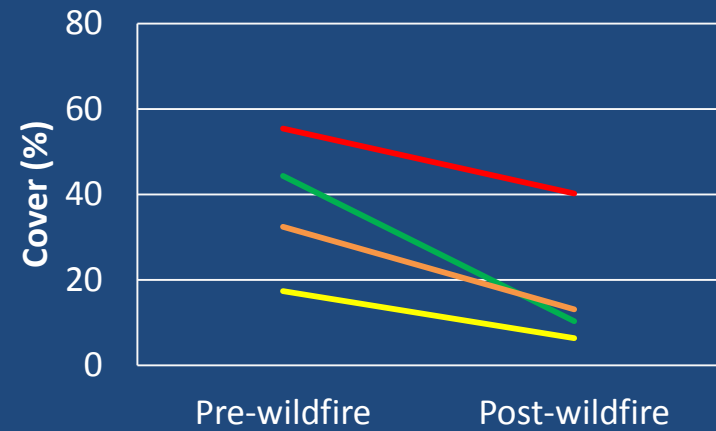


Same for cheatgrass

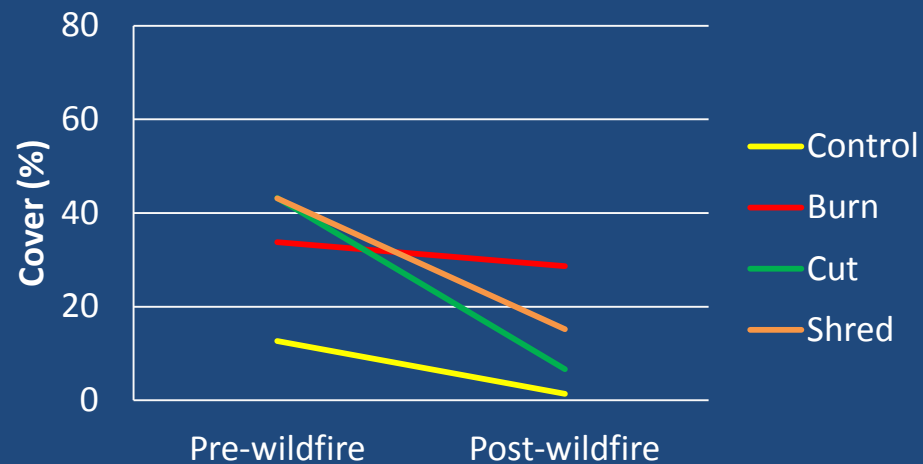
Phase I



Phase II

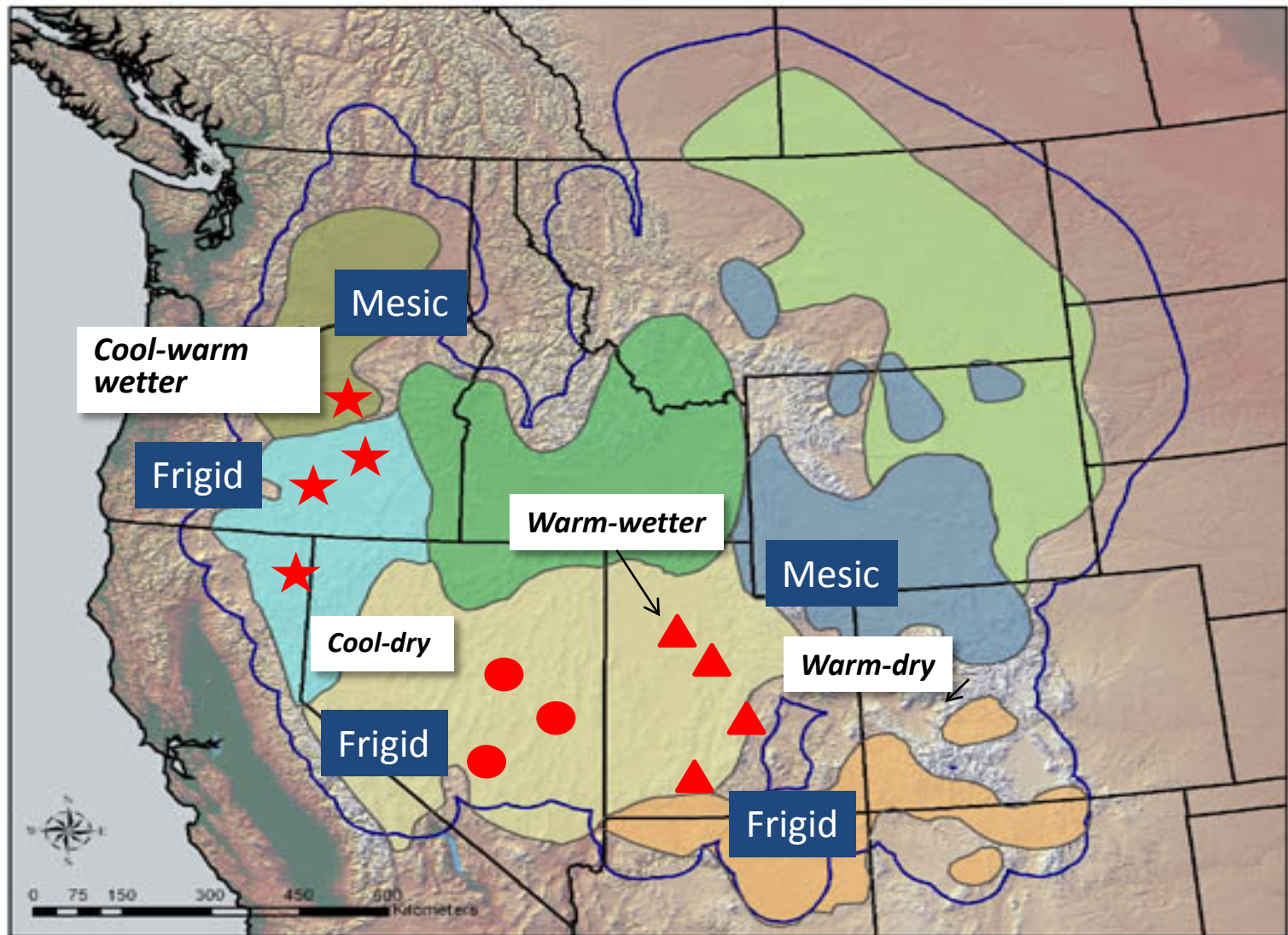


Phase III

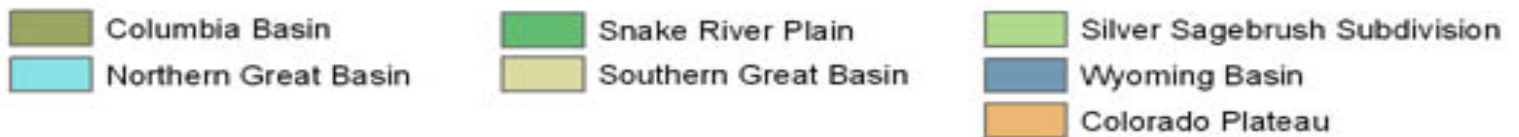


Post-shredding control burns may reduce fuels but save shrubs

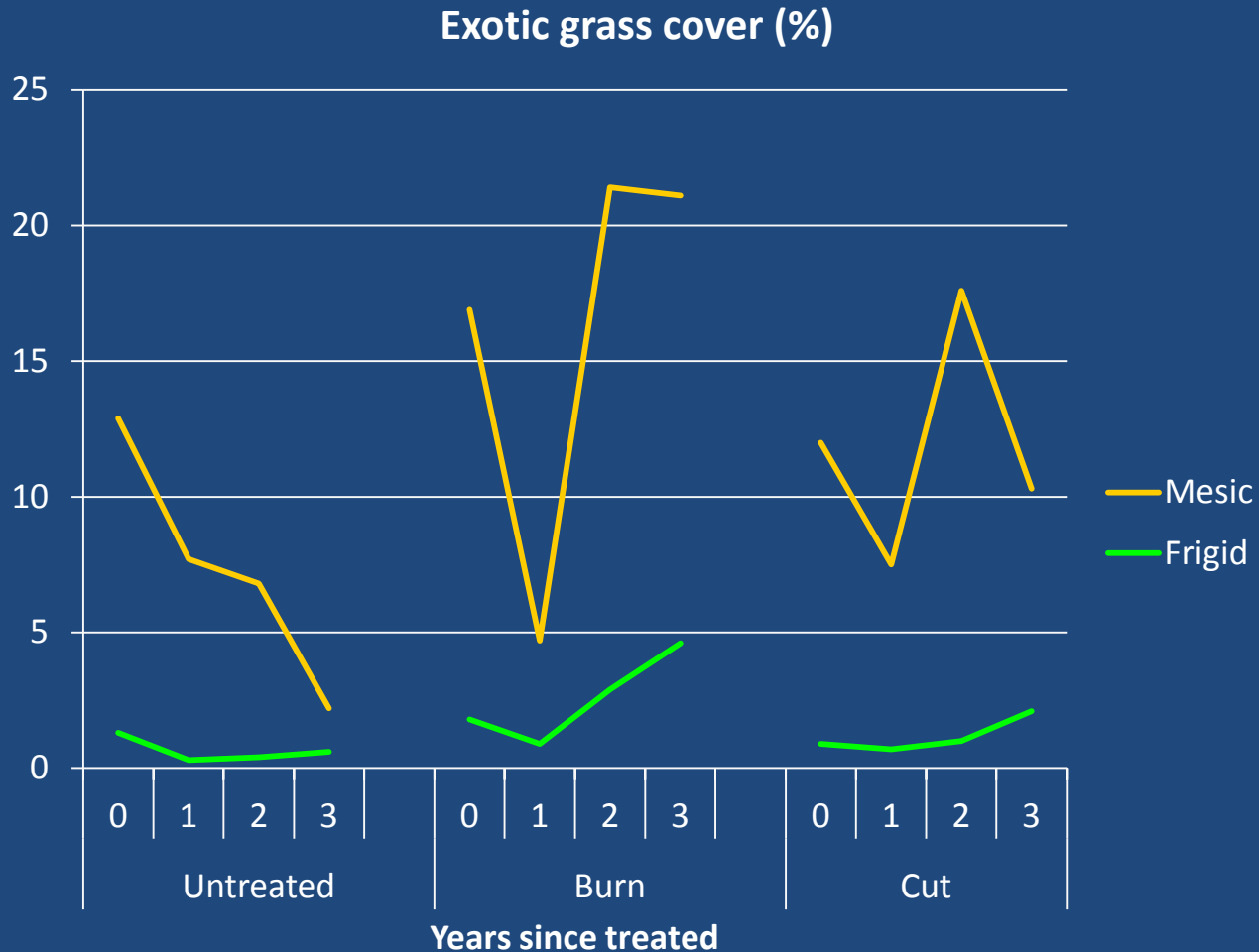




Floristic Provinces of the Sagebrush Biome

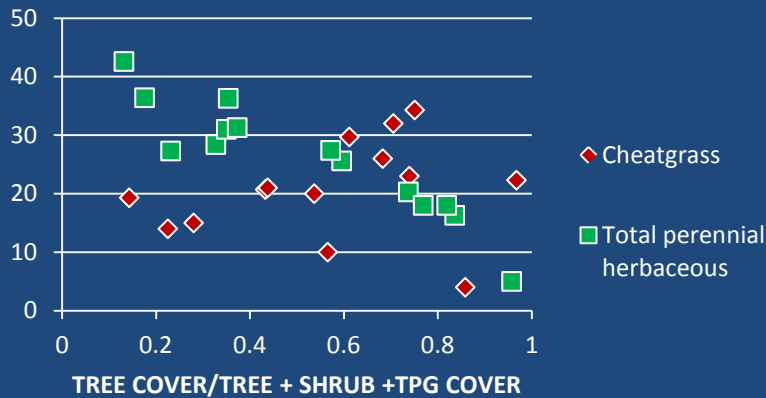


Cheatgrass cover greater on mesic than frigid soils

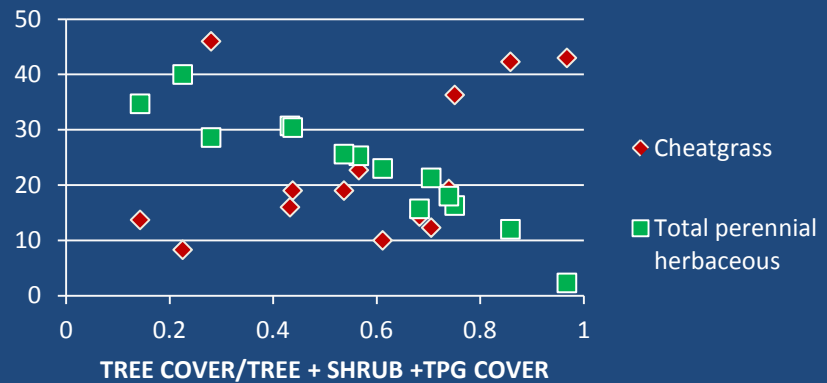


Perennial herbaceous cover decreases, cheatgrass abundant with increasing tree dominance; Scipio year 3

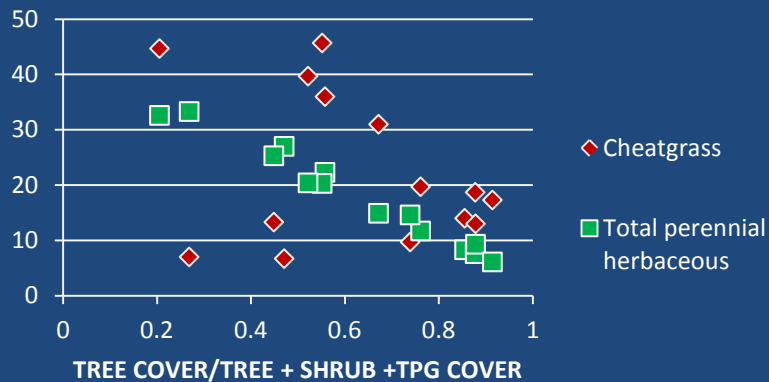
Control



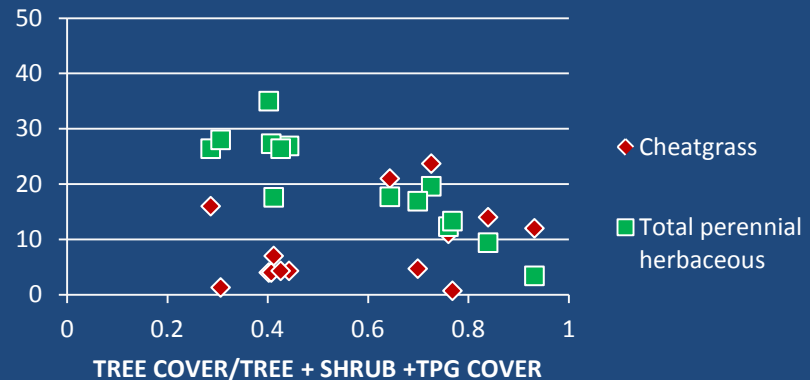
Burn



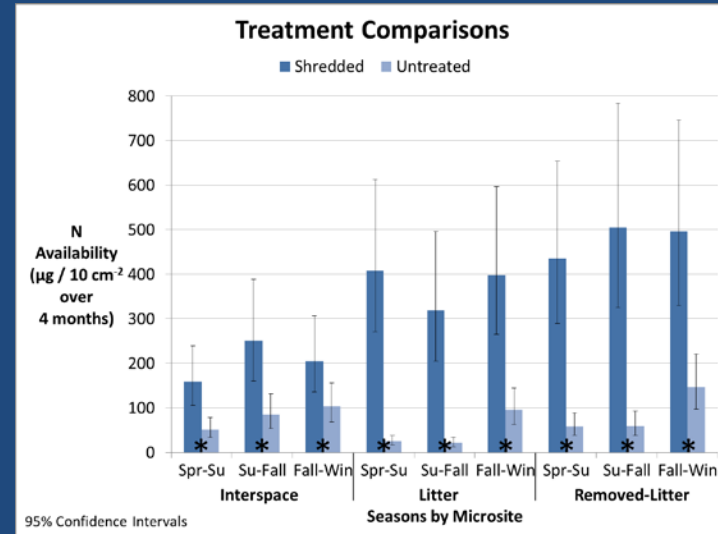
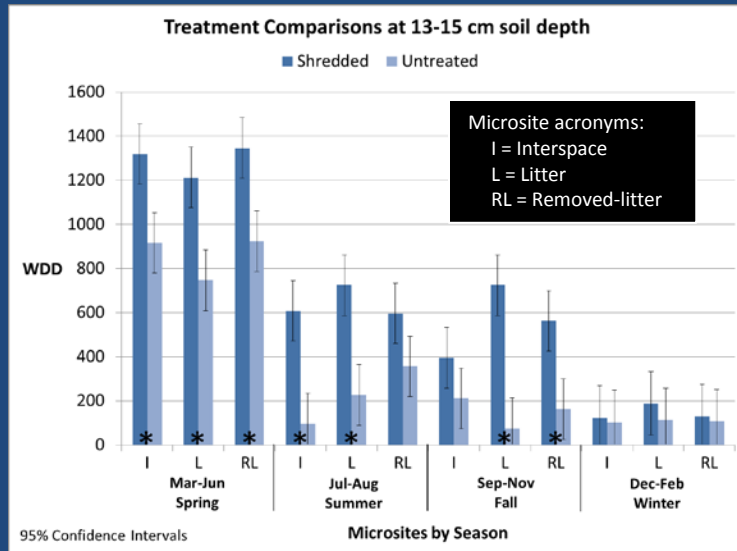
Cut



Shred



Burning and mechanical residues increase wet degree days, N, and increase cheatgrass cover on some sites



Onaqui burn



Pre-burn 2006



2007



2008



2009



2010

Onaqui cut



Pre-cut 2006



2007



2008



2009



2010

Onaqui Phases-Shredded

Pre-treatment 2006

2010

Phase I



Phase II



Phase III



Woodland Conclusions

- Prescribed fire kills trees and shrubs
- Mechanical cutting, shredding kills most trees, not shrubs
- Surface fuels
 - Burning reduces all classes
 - Cutting increases all classes
 - Shredding reduces to 1 and 10-hr sizes
- Treatments improve growing conditions for grasses
- Both tall perennial grasses and cheatgrass may increase a few years after treatment
- Perennial grass recovery looks promising even at previously-high tree cover
- Fire increases annual forbs
- Sagebrush seedlings are establishing in treatments
- Treatments decrease bare ground
- Future monitoring can help:
 - Determine perennial grass/weed outcomes for different environmental potentials
 - Length of treatment effectiveness
 - Recovery of shrubs
 - Effects of subsequent fire

Woodland management

- Control fuels at Phase I or II
- Warmer (mesic) sites have more chance of cheatgrass dominance-respond best if high perennial grass cover
- Use prescribed fire to control fuels best, but use mechanical where shrubs are desired
- Mechanical treatments have risk of subsequent high intensity fires
- Follow-up shredding with prescribed fire to kill small trees, keep shrubs, and reduce fuels

		<u>Burning</u>	<u>Mechanical</u>
Grasses	Tall	↓ ↑	↑ →
	Short	→	→
	<u>Cheatgrass</u>	↑	↑
Forbs	Annual	↑	↑
	Perennial	↑	↑
Sagebrush		↓	↑