

Western Juniper- Issues and Solutions

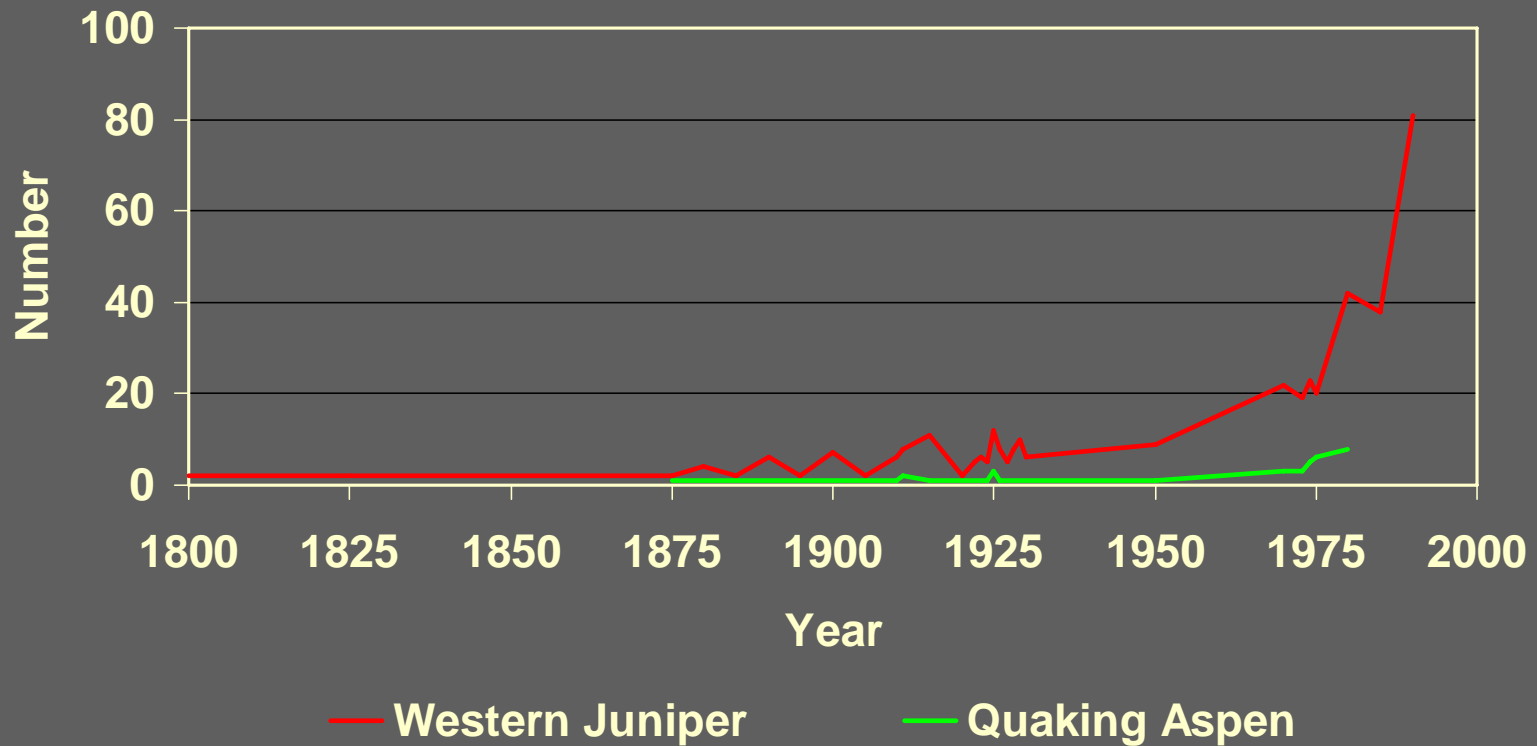


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Western Juniper- Steens Mountain



Alturas Juniper



Steens Juniper



Small Junipers on Steens



Forage Production= 50 -100#/acre



*Suppression of Understory Plants by
Juniper on Steens Mountain*



*Cut Juniper Plot on Steens.
Over time forage production =
800-1000#/acre*



Pre-Settlement Woodlands

- Western Juniper confined to three major fire safe localities
 - Rocky ridgelines, outcrops...
 - Low sagebrush zones with fractured subsurface bedrock
 - Central Oregon pumice zone (around Bend)

Big Steens Juniper





Initial Factors for Juniper Expansion

- Favorable establishment conditions, 1885-1920
- General overstocking of livestock which removed fine fuels
- Lack of prescribed fire- removal of Native Americans

Present Day Factors

- Fire suppression (esp. since 1940's in rangelands)
- Lack of fuels resulting from site dominance by juniper
- Lack of prescribed burn programs

Fire History

- Pre-settlement fire return intervals
 - Mountain sagebrush zone (4700 – 6000 ft), Chewaucan River Basin
 - 12 to 15 year fire return interval (range 3 – 28 years)
 - Southwest Idaho
 - 40 to 50 year interval sufficient to inhibit juniper expansion
 - Low sagebrush zones
 - 90 to 100 year fire return interval
- Fire years were preceded by 1 -2 years of above average precipitation

Extent of Western Juniper Woodlands

- 8.5 million acres in western juniper woodland
 - Oregon – 5.0 million acres
 - SW Idaho – 450,000 acres
 - NW California – 1 million acres
 - N Nevada – 2 million acres
- 95% of the woodlands are 100 years old or less

Plant Communities Affected

- Mountain sagebrush
- Aspen
- Riparian
- Low Sagebrush
- Increasingly low elevation Ponderosa Pine
- Majority of stands are still expanding

Ecological Effects of Juniper Expansion

- Significant reductions in shrub/understory production and cover
 - Especially true on soils with restrictive layers
 - On deeper soils tendency to lose shrubs but may retain cover of the grass and herb layer (e.g. Idaho fescue sites)
- Reduced plant diversity
- Increased erosion potential
 - Mostly low elevation, or south and west aspects, and shallow soils with restrictive layers- based on SW research
- Loss of wildlife habitat

Proven Effects of Cutting or Burning in Juniper Woodlands

- Increase understory production
- Increase plant diversity
- Increase shrub cover
- Increase ground cover
- Reduce erosion

Soil/Ash Profile



Kiger Gorge



McCoy Ridge Aspen



*Impact of Western Juniper on
Hillslope Hydrology:
Steens Mountain, OR*

USDA – Agricultural Research Service

Northwest Watershed Research Center, Boise, ID

Sustainable Management of Rangelands Research Unit, Burns, OR

*Vegetation Response Following
Juniper Cutting, Steens Mtn, Oregon*



*Rainfall Simulation Equipment for Studying
Infiltration, Runoff, and Erosion Patterns*



Uncut Juniper Treatment



Cut Juniper Treatment



Head Wall Style



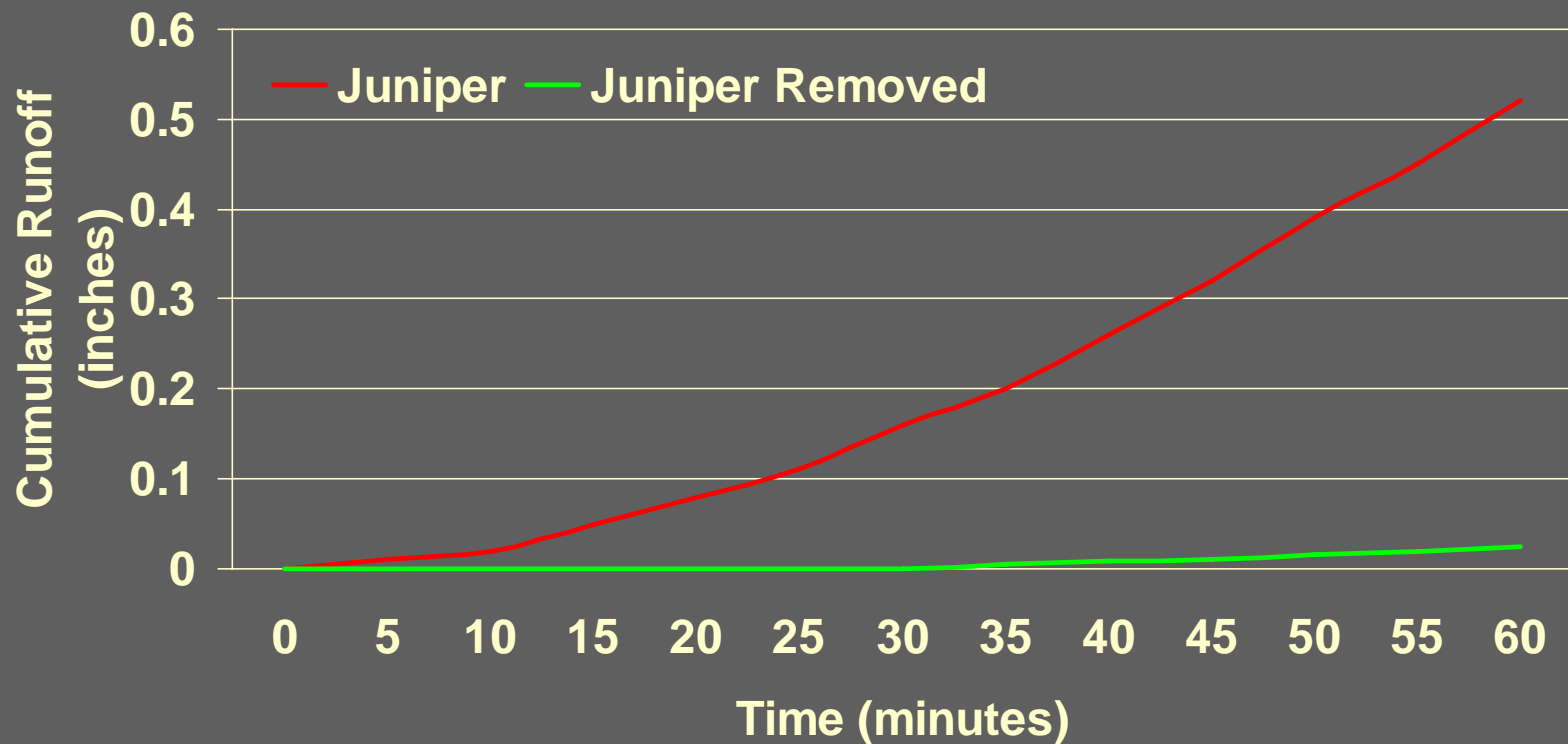
Silty Water from Woodland Plot



No Runoff in Cut Plot

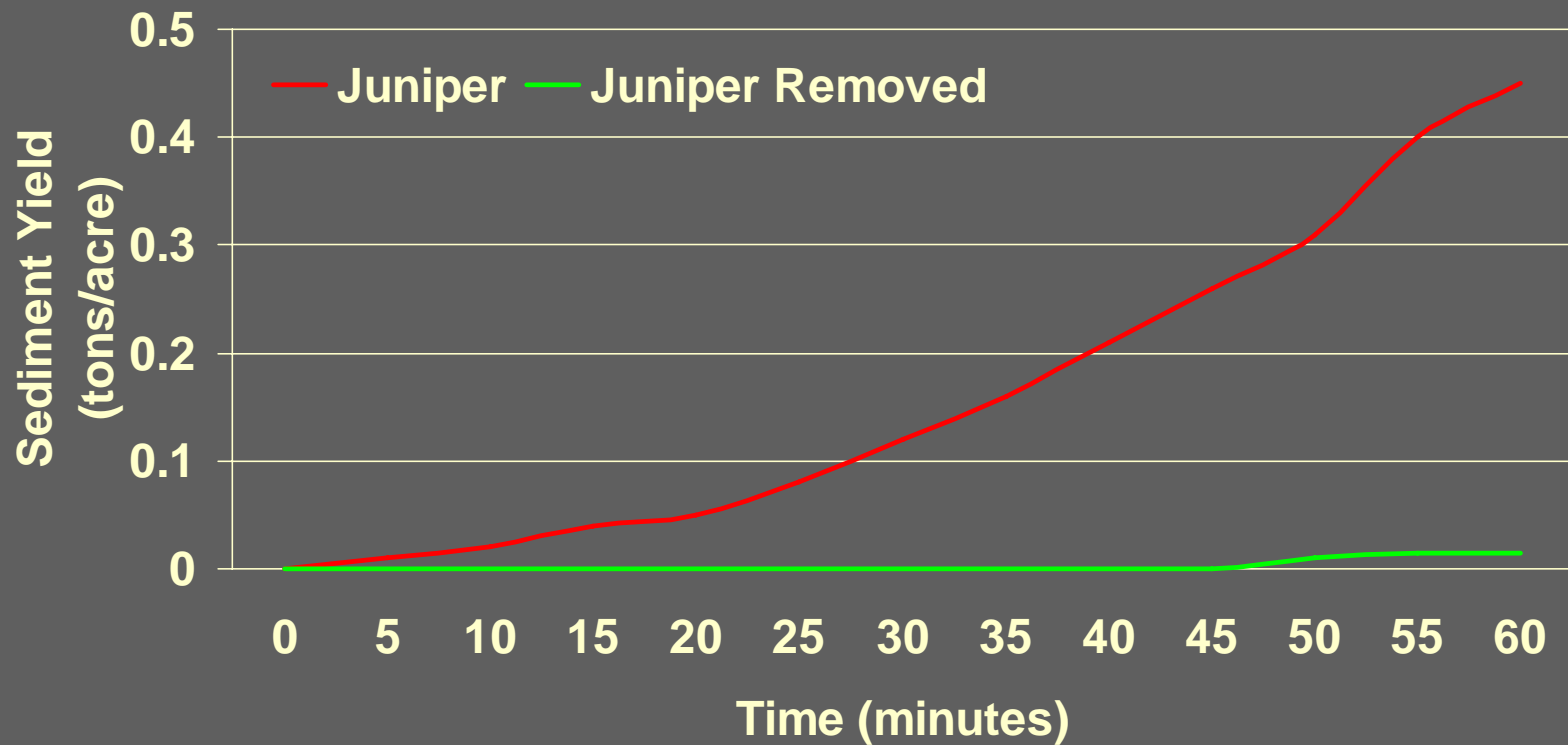


Removing Juniper Decreases Runoff Volume



Rainfall = 2.1 inches/hour

Removing Juniper Reduces Sheet Erosion

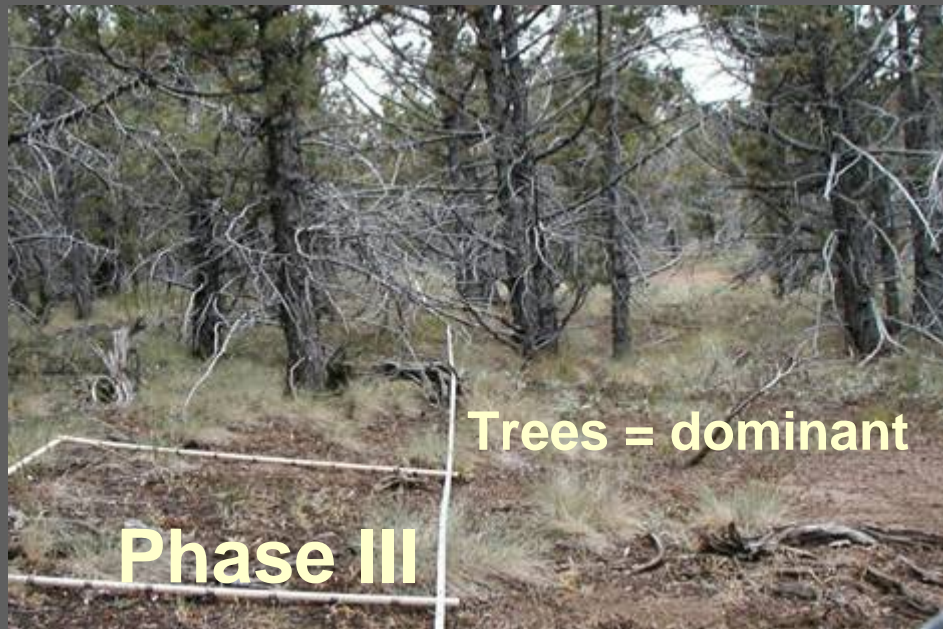


Rainfall = 2.1 inches/hour

Water Use by Juniper

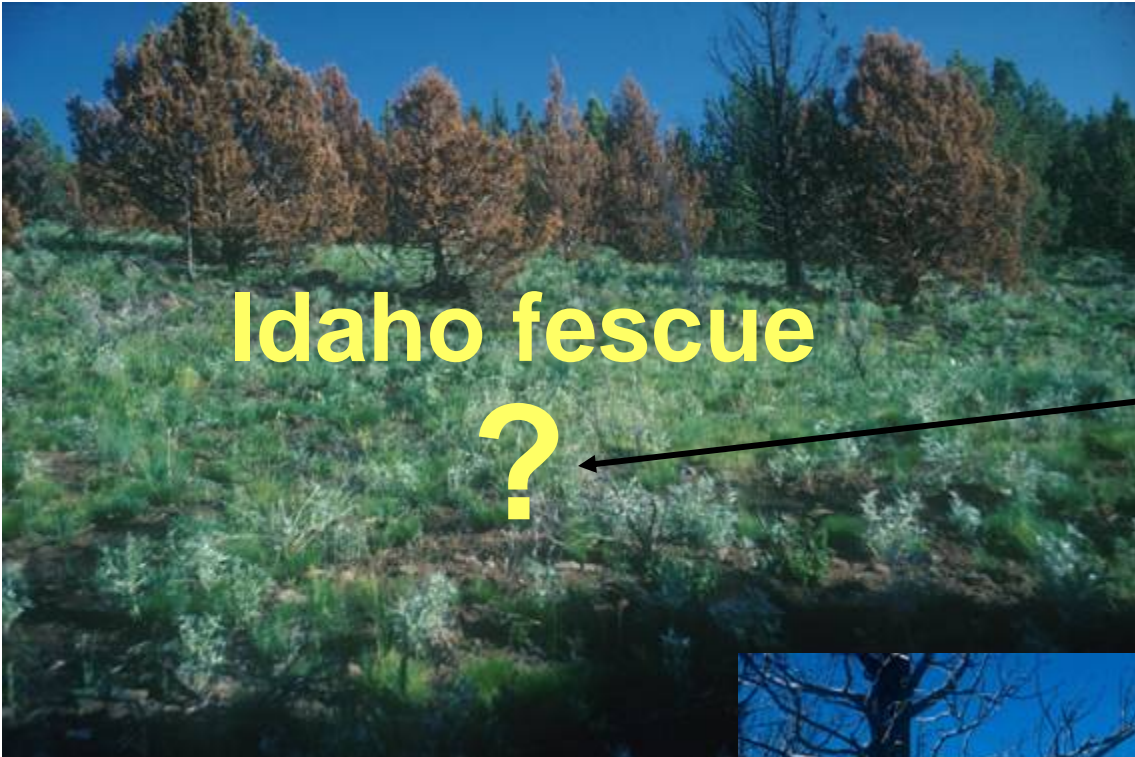
- There are two projects currently underway to help fill in this void. This is difficult work to do on a large scale.
- Interception and transpiration losses
- Shortening of growing season for associated species, intense competition, and potentially less off site movement of water.

Woodland Succession



Steens Mountain Burn





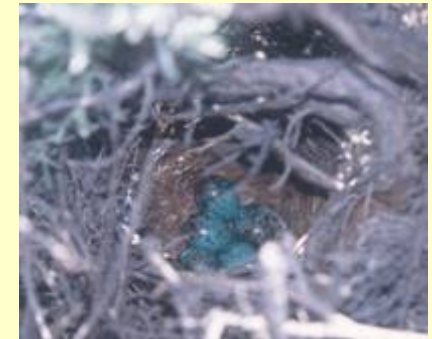
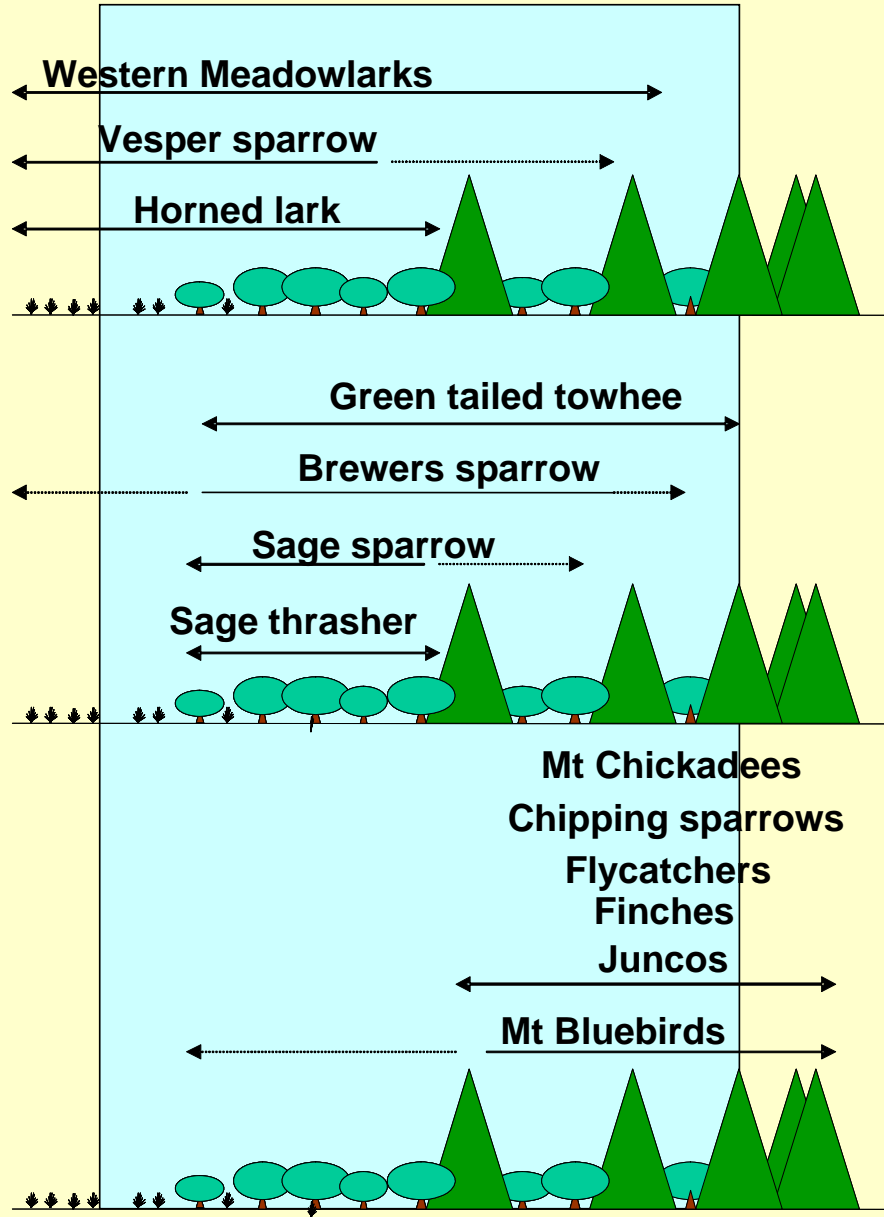
Idaho fescue

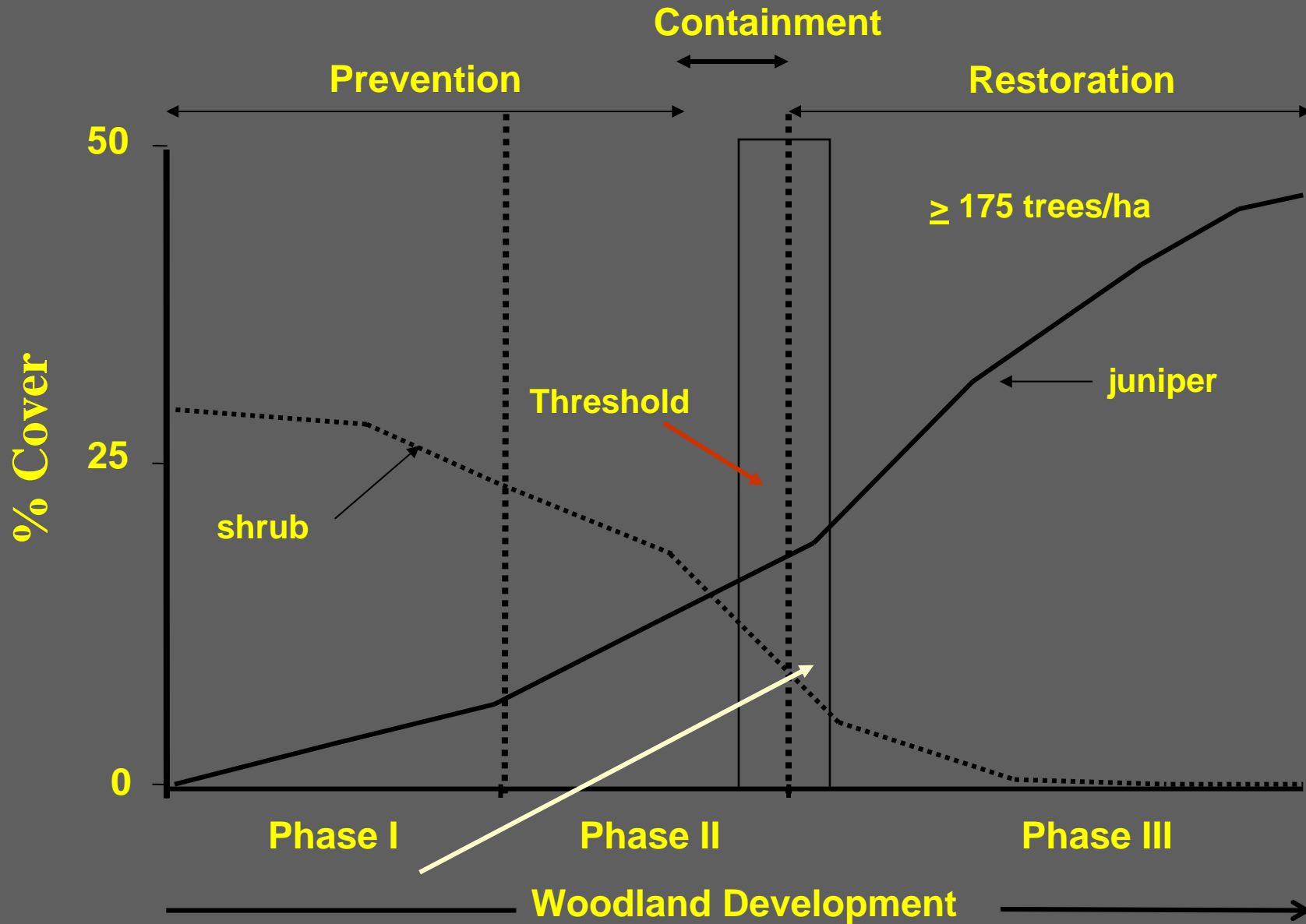
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Cheatgrass

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SUMMARY - WESTERN JUNIPER

- We have a pretty good knowledge base from which to make decisions.
- Western juniper can have large impacts on the ecological health of rangelands.
- Western juniper is expanding at relatively rapid rates.
- The ability to age this species has helped us understand its dynamics.

What to do about western juniper ?

- Be sure the sites are not historically western juniper sites
- Focus on early phases of juniper encroachment, where fire is still an option
- Consider cutting where the return is likely to be greatest (both ecologically and economically)

What to do? -continued

- In some places combinations of cutting and burning might be an option to reduce cost.
- Do an initial vegetation survey to determine if the site is likely to recover naturally, or if reseeding will be required.