

# Prescribed Fire in Riparian Zones Affected by Conifer Expansion: Ecological, Hydrologic and Socio-Economic Effects

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# The problem: Conifer encroachment in montane rangeland watersheds



# Effects of conifer encroachment

- Increased wildfire danger
- Reduced herbaceous & shrub understory
  - Loss of plant & animal diversity
  - Change in soil properties
- **Hydrologic change**
  - **Reduced streamflow for fisheries**
  - **Less water for agricultural, domestic uses**

# The solution: Prescribed burning?



# Potential drawbacks of fire

- Damage from escaped wildfire
- Loss of water quality
- Change in soil properties
- Loss of economic value
- Reduced recreation & scenic quality
- Conflict with riparian protection rules

# Project goal: Evaluate tradeoffs of riparian restoration via Rx fire

- Objectives:
  - Measure water quantity/quality & riparian vegetation responses to burning
  - Evaluate social & economic factors influencing prescribed fire acceptance & implementation
  - Develop management recommendations and guidelines for use of prescribed fire
  - Stakeholder information efforts

## Whitetail Watershed Restoration Project

A cooperative effort to restore vegetation for watershed improvement.

2004 - 2006

This project provides a unique opportunity to cooperatively study the effect of conifer thinning and controlled fire on plant communities, wildlife habitat, and stream bank recovery in an area containing a mixture of forest and shrubs.

The Following Cooperators Made This Restoration Project Possible  
Bureau of Land Management, Jefferson River Watershed Council, Montana Agricultural Experiment Station - Montana State University, Fitzgerald Ranch, Tomahawk Ranch, USDA Forest Service - Jefferson Ranger District, MFWP - Butte Area Office, Montana Bureau of Mines and Geology

For More Information Contact: BLM Butte Field Office, Butte, MT.



Study location: Upper Whitetail Basin, Jefferson County, MT  
Two control, two experimental sub-watersheds





2 yrs pre-treatment data

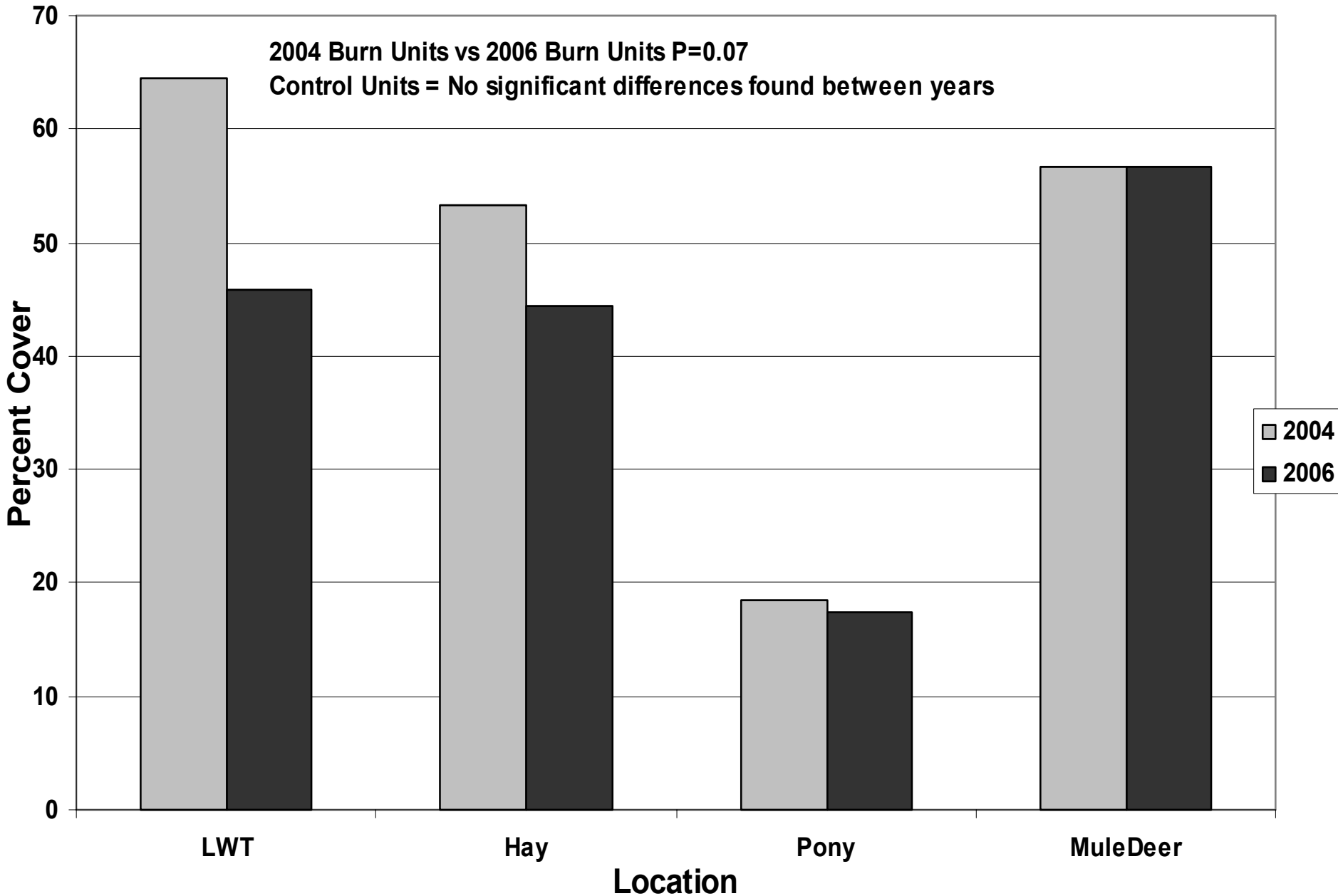
Burned in Fall 2005, Spring  
2006

Measure sub-surface and  
surface flow, vegetation  
responses

# Socio-economic studies

- Economic modeling of factors influencing agency decisions about fire restoration
- Citizen surveys about knowledge and social acceptability of prescribed fire
- Survey research in conjunction with related conifer encroachment studies in Great Basin, Southern Great Plains

# Total Tree Canopy Cover



# Hay Canyon Average Monthly Discharge (g/hr)

