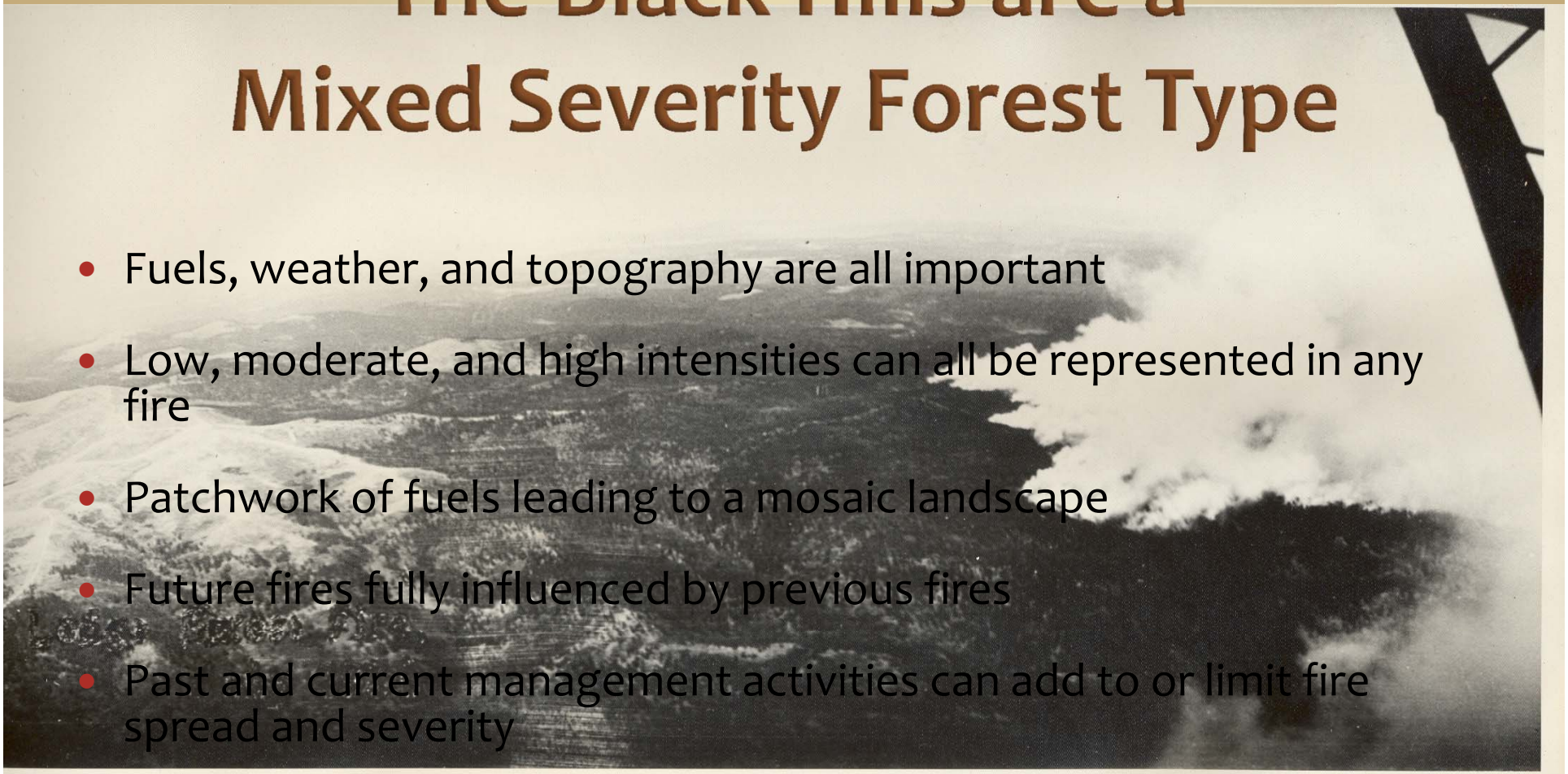
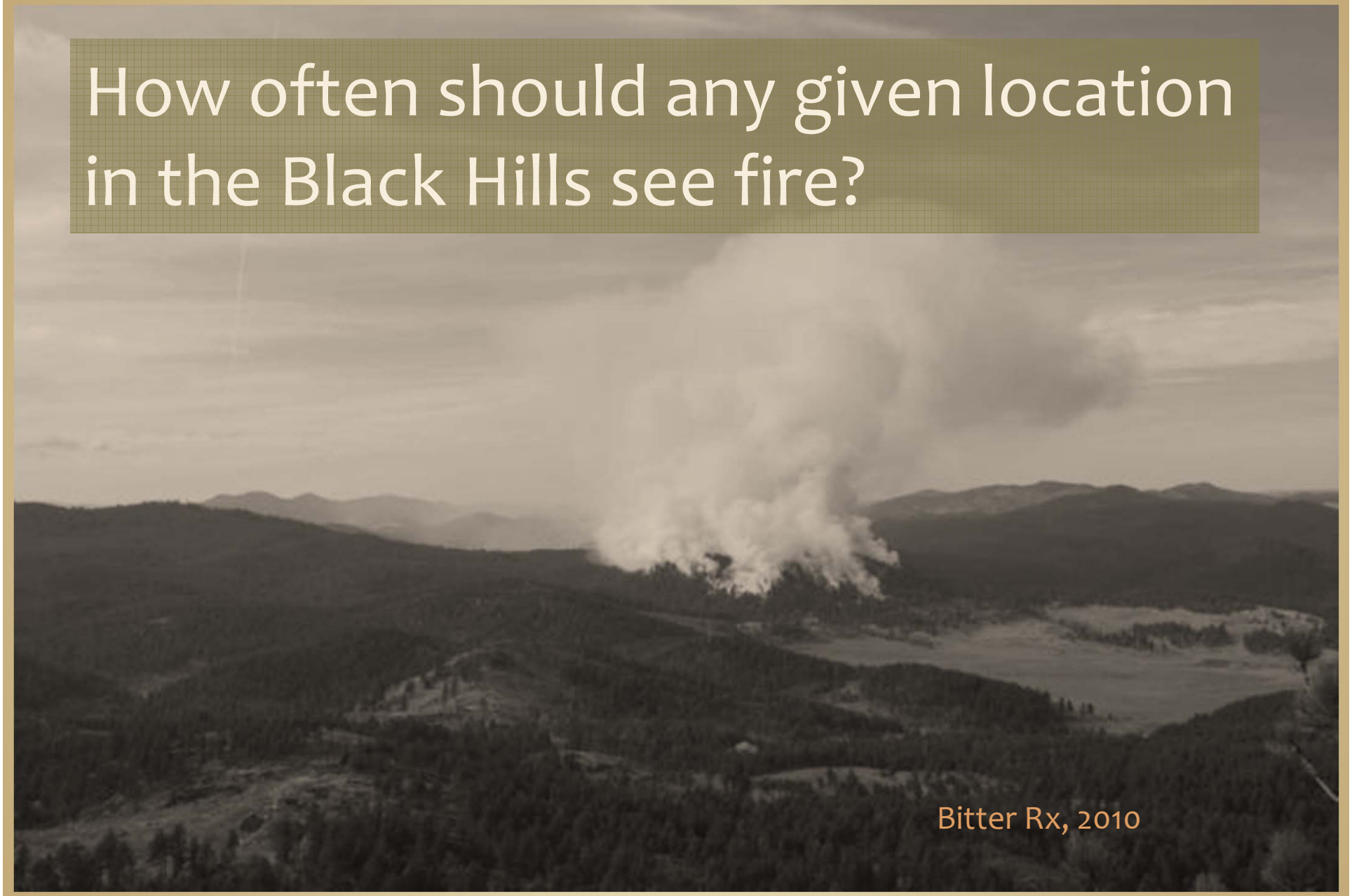
Managing Fire in the Black Hills

The Black Hills are a Mixed Severity Forest Type



- Fuels, weather, and topography are all important
- Low, moderate, and high intensities can all be represented in any fire
- Patchwork of fuels leading to a mosaic landscape
- Future fires fully influenced by previous fires
- Past and current management activities can add to or limit fire spread and severity
- Complex and difficult to characterize

How often should any given location in the Black Hills see fire?

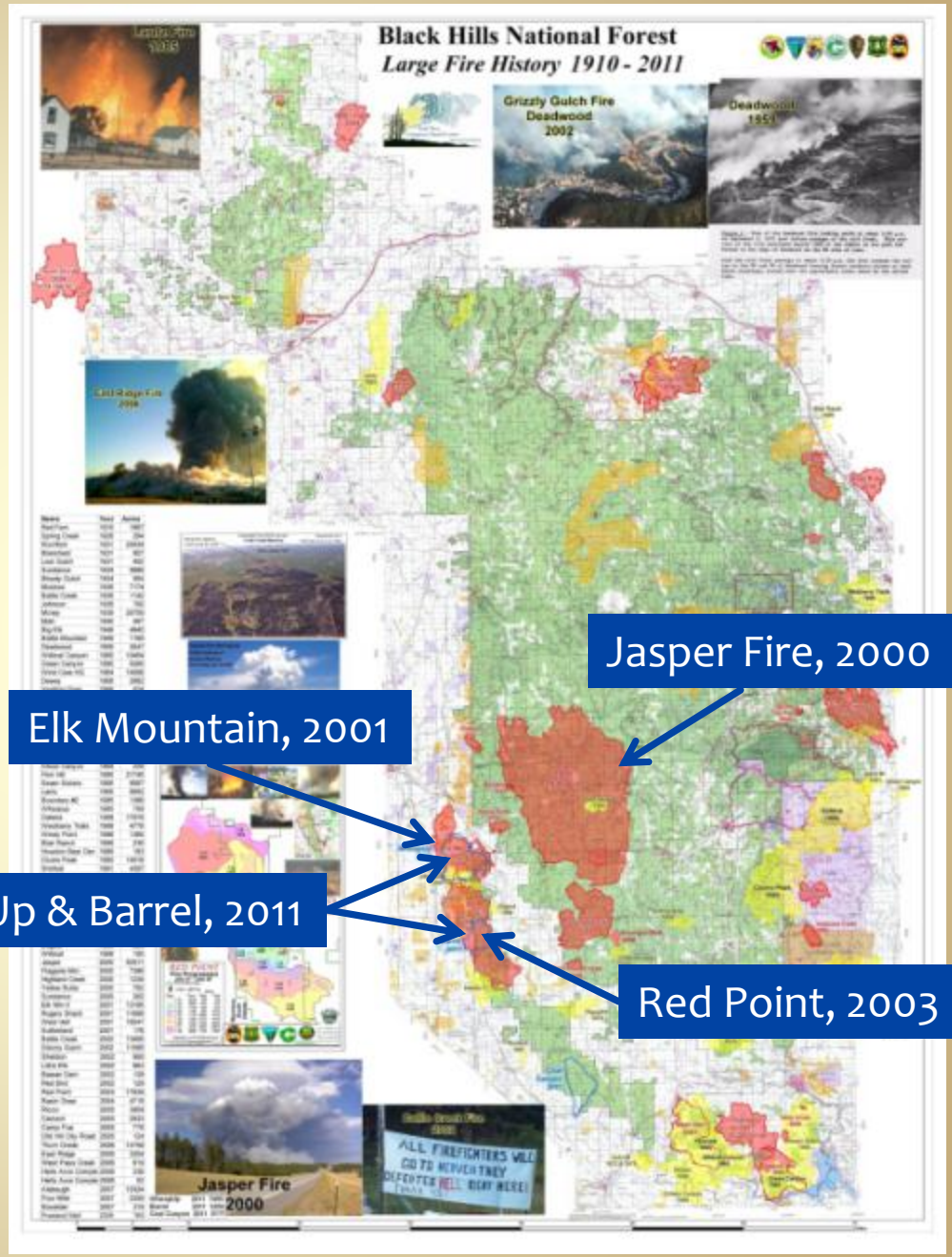


Fire History Studies

Location	Environment	Elevation	Precip.	Fire Return Interval
Devil's Tower	Open Pine and Savanna	4,200'	17"	27 years
Jewel Cave	Interior pine forest	5,500'	18.5"	22 years
Wind Cave	Pine and mixed-grass prairie	4,200'	17"	11 years
Black Elk Wilderness	Upper elevation pine	6,500"	21"	23 years (range of 11 to 74 years)
Northern Hills	Interior pine forest	4,100"	24"	13 years (range of 1 to 43 years)
Mt. Rushmore	Interior pine forest	5725'	21"	17 years (range of 3-33 years

Black Hills Large Fire History

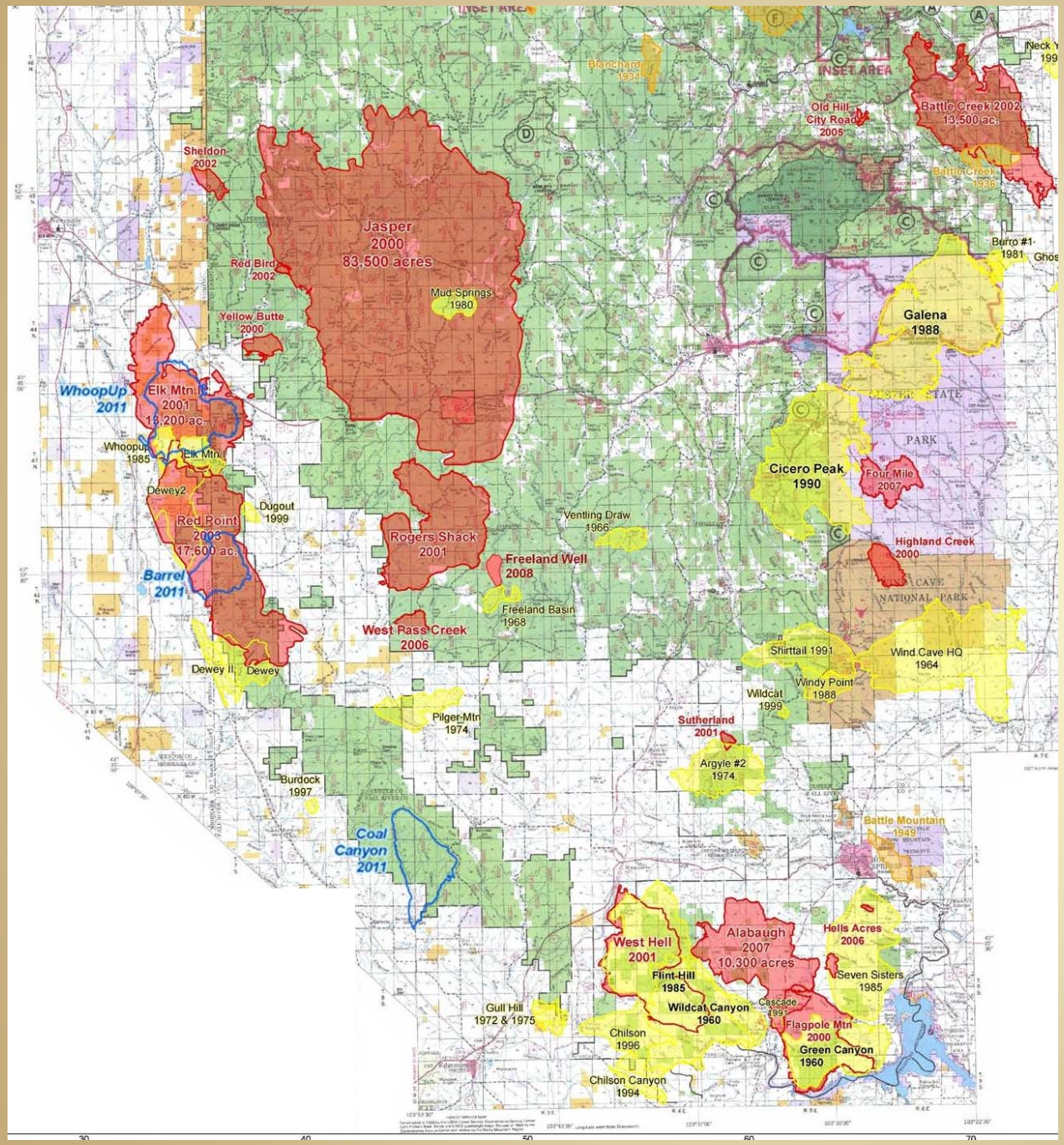
- 1910-2011
- Fires over 100 acres
- Notice the southern tier with multiple burns in same area.



Similar fuels present before Whoopup & Barrel Fires

Lemming Draw, Jasper Fire area

Burnout Operations
Barrel Fire
Custer County, South Dakota
Weston County, Wyoming
BLACK HILLS
NATIONAL FOREST
Northeast corner of fire
Photo looking west
July 23, 2011
N
≈ 4 north to miles to Whoopup fire



How much country is ready to burn again?

How much country is ready to burn for the first time in 100 years?

Lemming Rx, 9/31/11

- Fuel Conditions =moderate
- Weather Conditions =moderate

Areas of heavy fuels burned with a high severity under <u>moderate</u> conditions.

- 1776 acres
- 5 hours to ignite
- <$50/acre to *implement*

Lemming Rx, 9/31/11

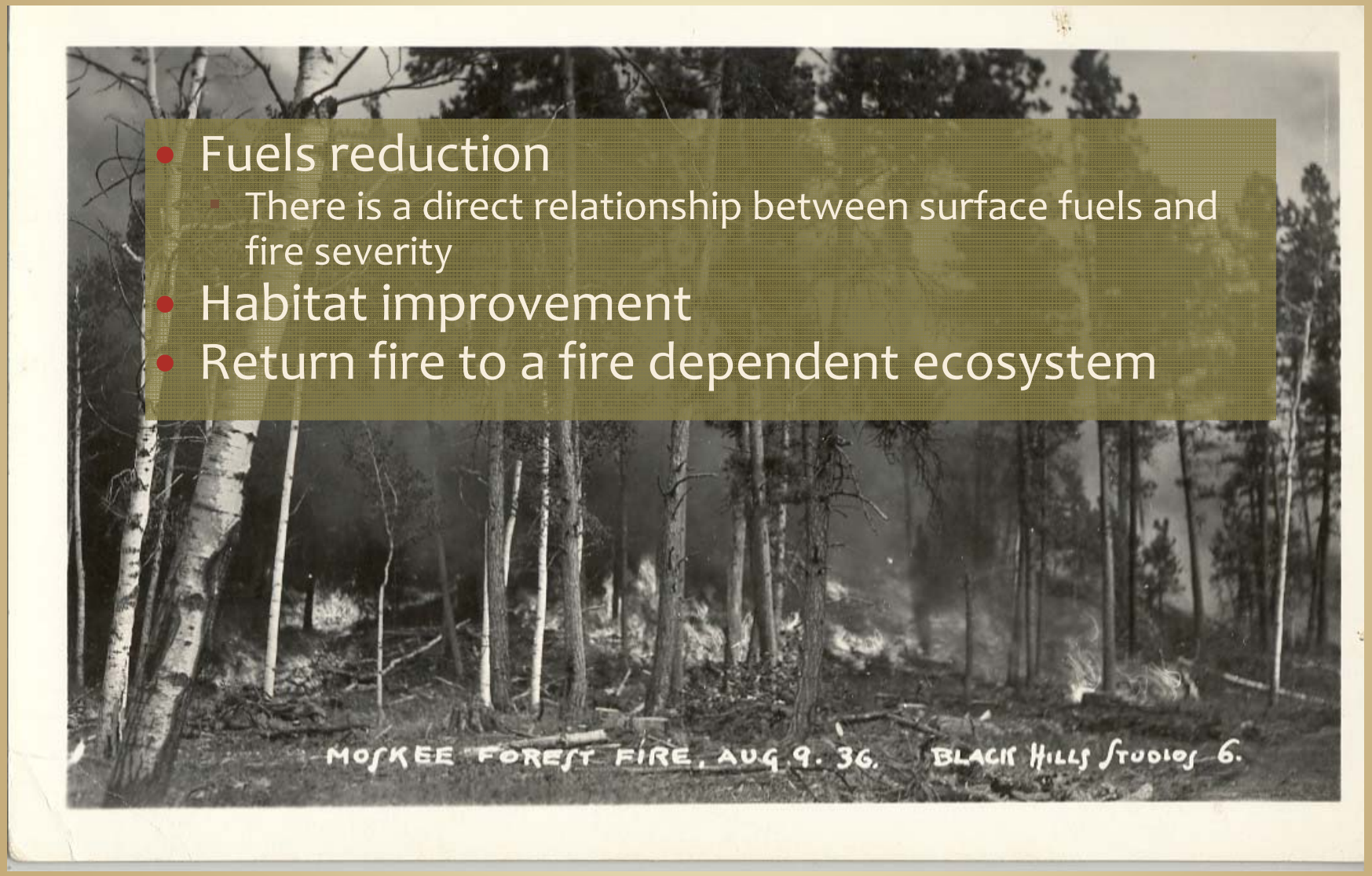
- Fuel Conditions =moderate
- Weather Conditions =moderate

Areas of low to moderate fuels burned with a reduced severity under moderate conditions.

- Notice the partial mortality in the pine regeneration

Harnessing Fire

Why do we burn?



- Fuels reduction
  - There is a direct relationship between surface fuels and fire severity
- Habitat improvement
- Return fire to a fire dependent ecosystem

Where do we burn?

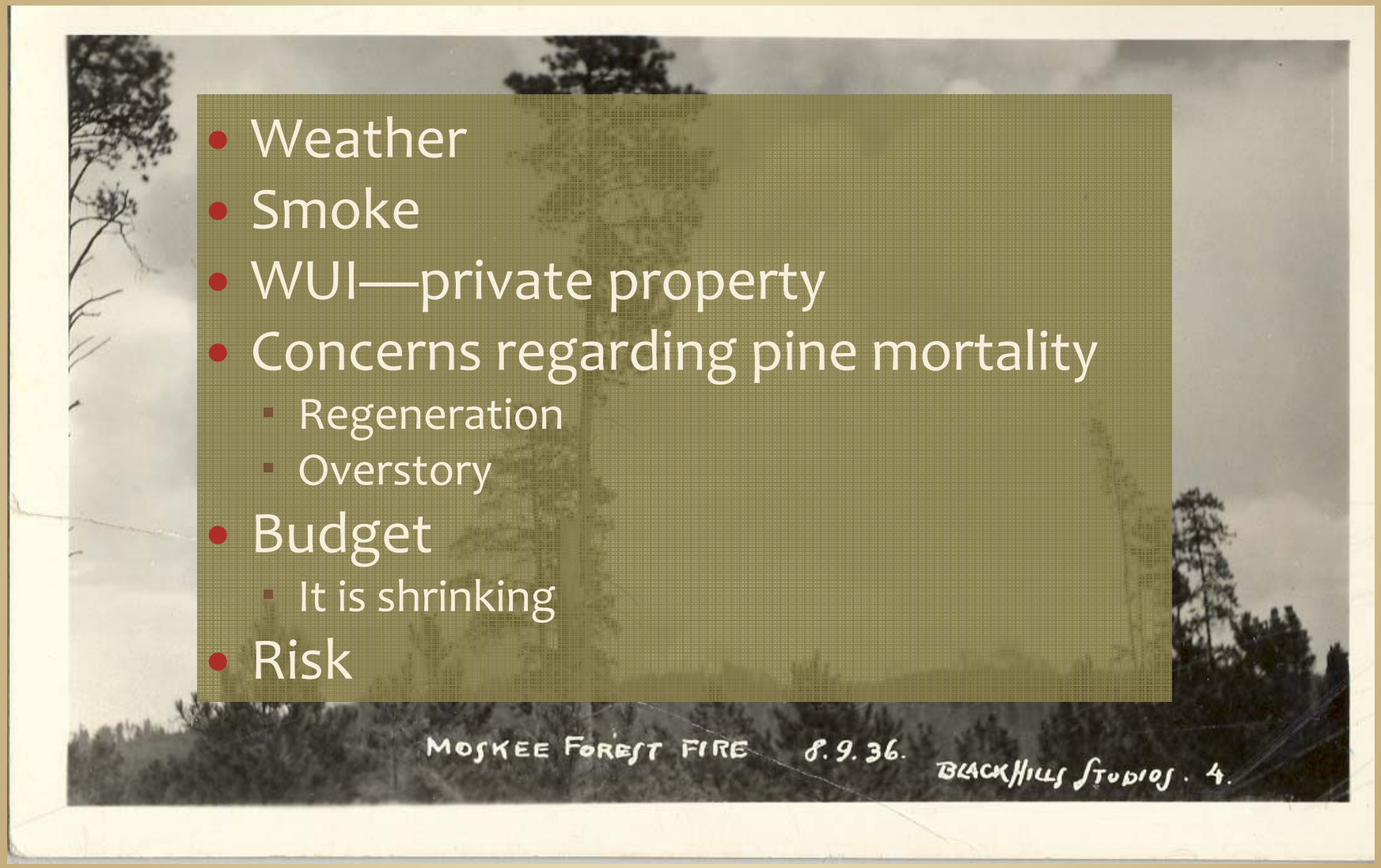
- Where the NEPA allows.
- Where it is tactically practical and safe.
  - Risk
- Where it is socially expedient? or not expedient…

Where should we burn?

- Landscape scale burns away from towns and homes?
  - This is primarily what we have been doing.
- Smaller units, strategically placed within the Wildland Urban Interface?

It depends on your priorities.

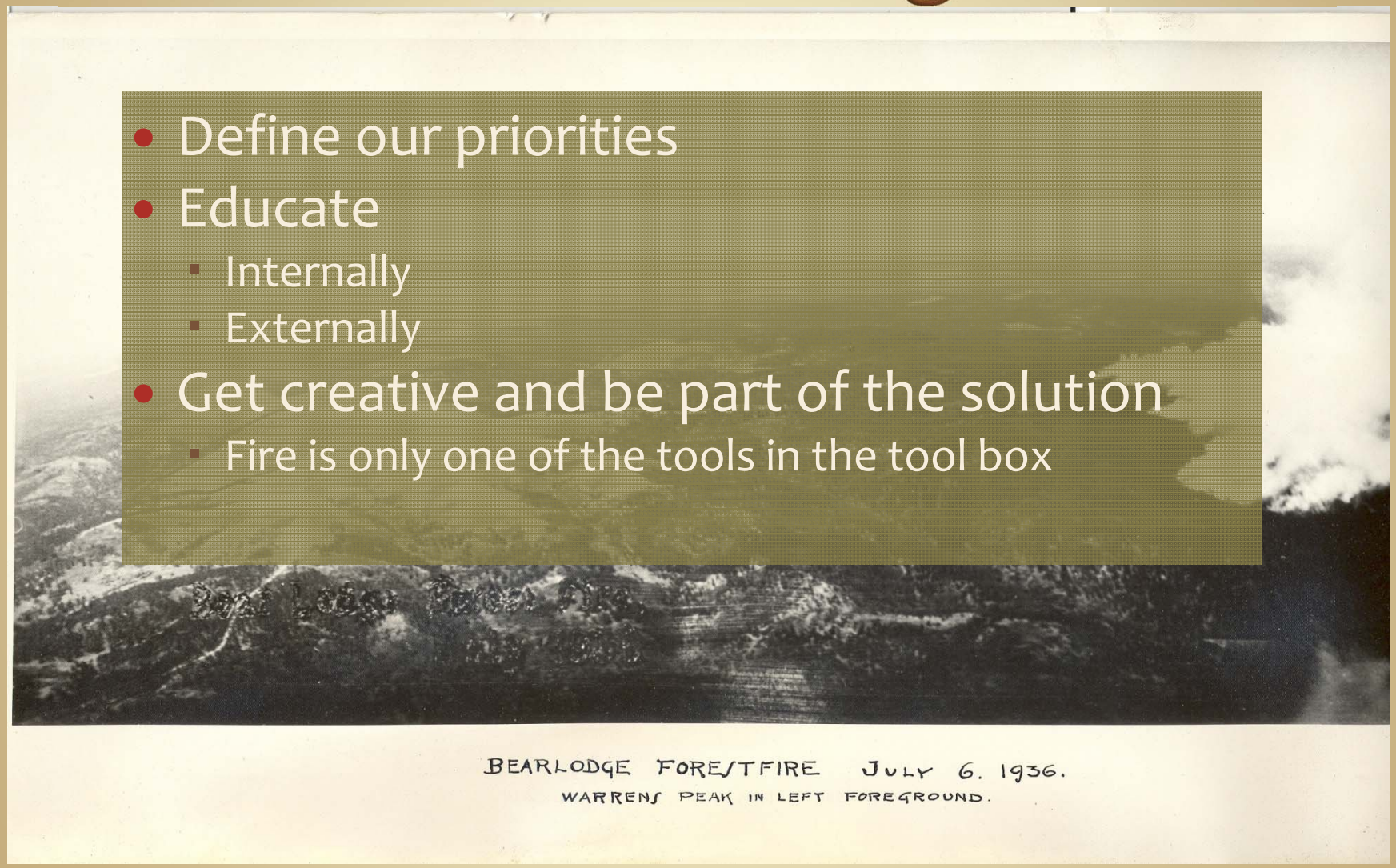
Constraints



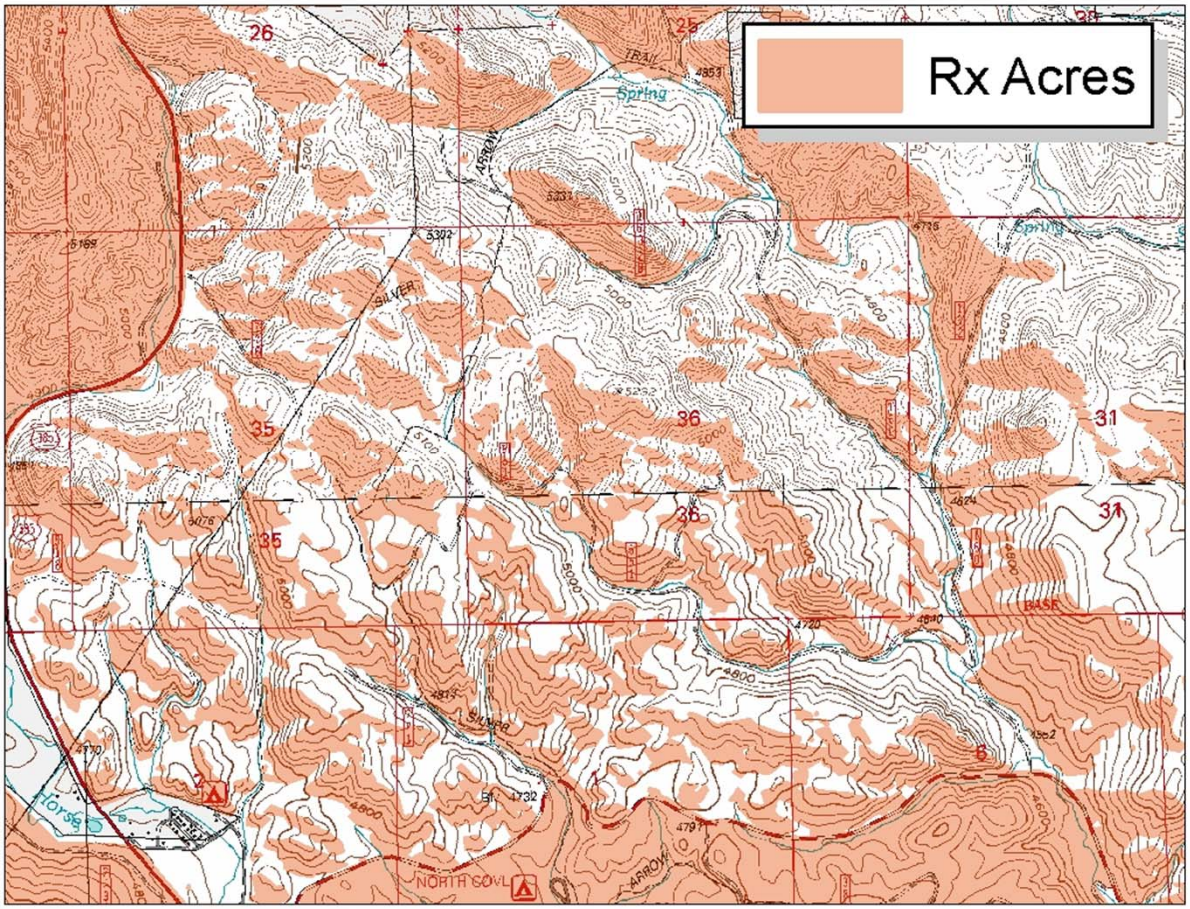
- Weather
- Smoke
- WUI—private property
- Concerns regarding pine mortality
  - Regeneration
  - Overstory
- Budget
  - It is shrinking
- Risk

What is a fire manager to do?

- Define our priorities
- Educate
  - Internally
  - Externally
- Get creative and be part of the solution
  - Fire is only one of the tools in the tool box



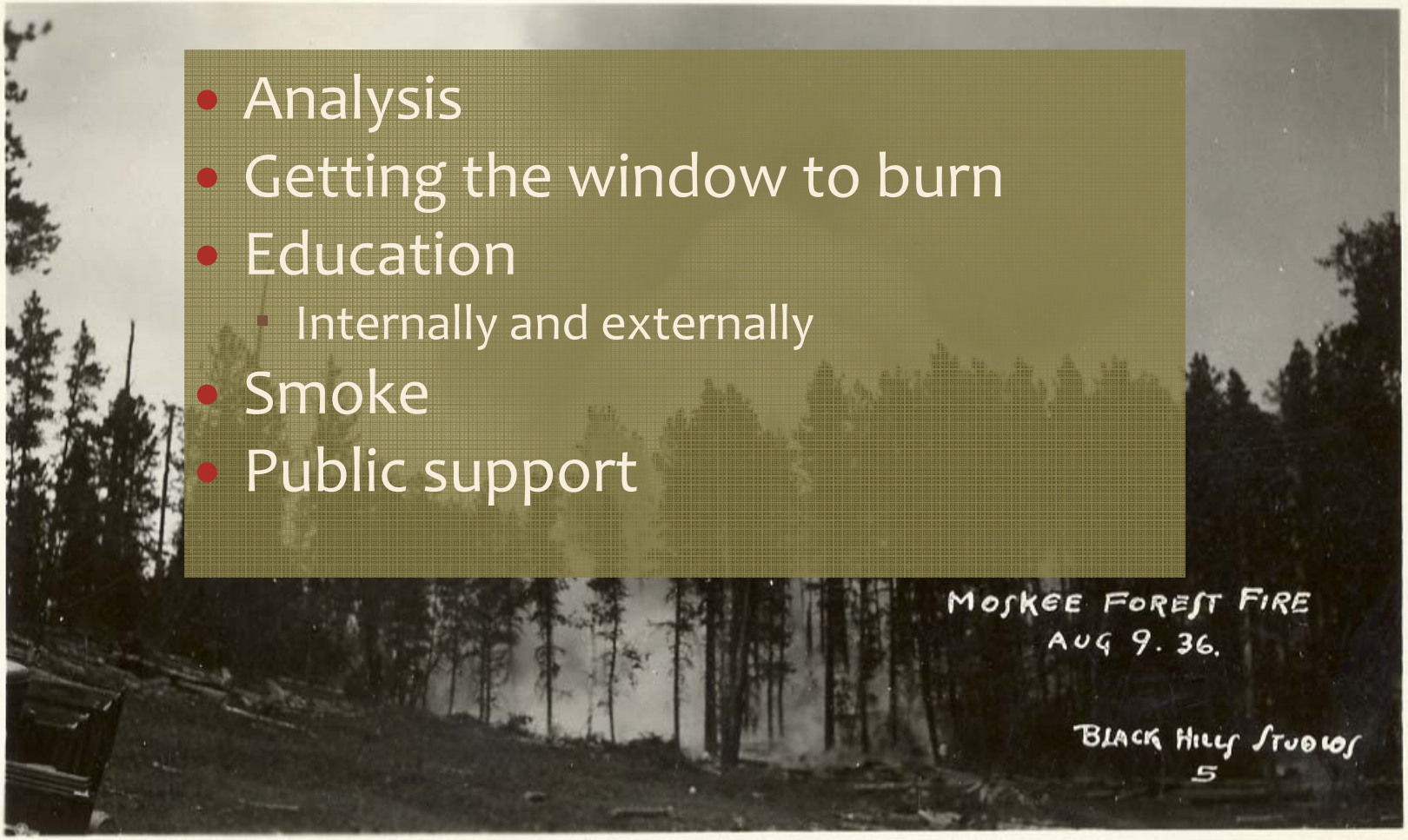
South Slope Burning: A New Approach



Open slopes were figured for the Sun's position @1300, February 1st

- **Environmental prescription:**
  - Warm, dry, sunny winter days
  - Open south slopes
- **Holding Plan:**
  - Frozen, snowy north-slopes
  - Minimal resources required
  - Maximum allowable area
- **Benefits:**
  - Reduced risk
  - Reduced fire severity
  - Reduced cost

Challenges to South Slope Burning

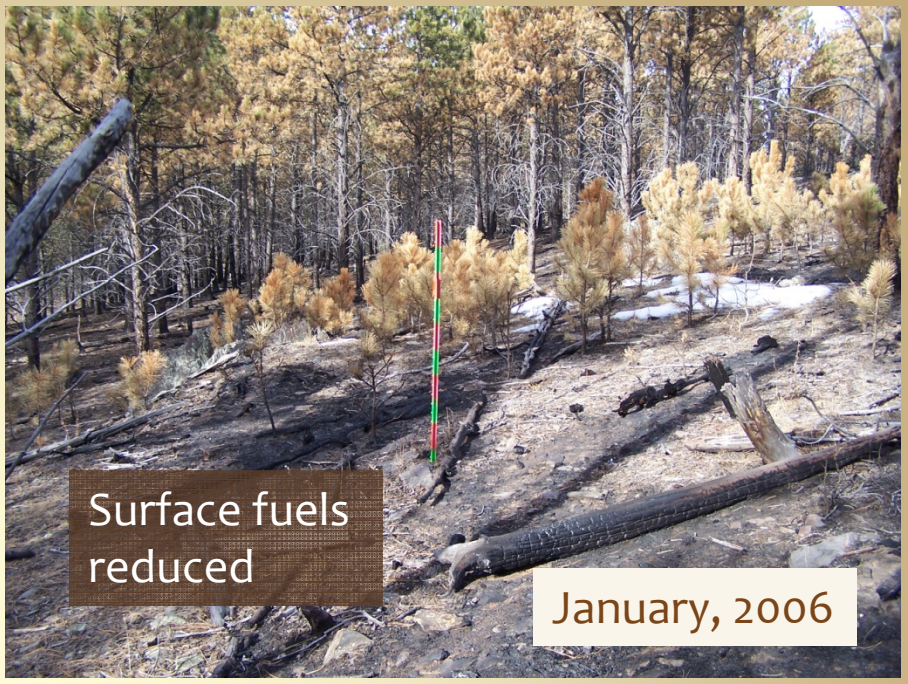


- Analysis
- Getting the window to burn
- Education
  - Internally and externally
- Smoke
- Public support

Why should we burn?

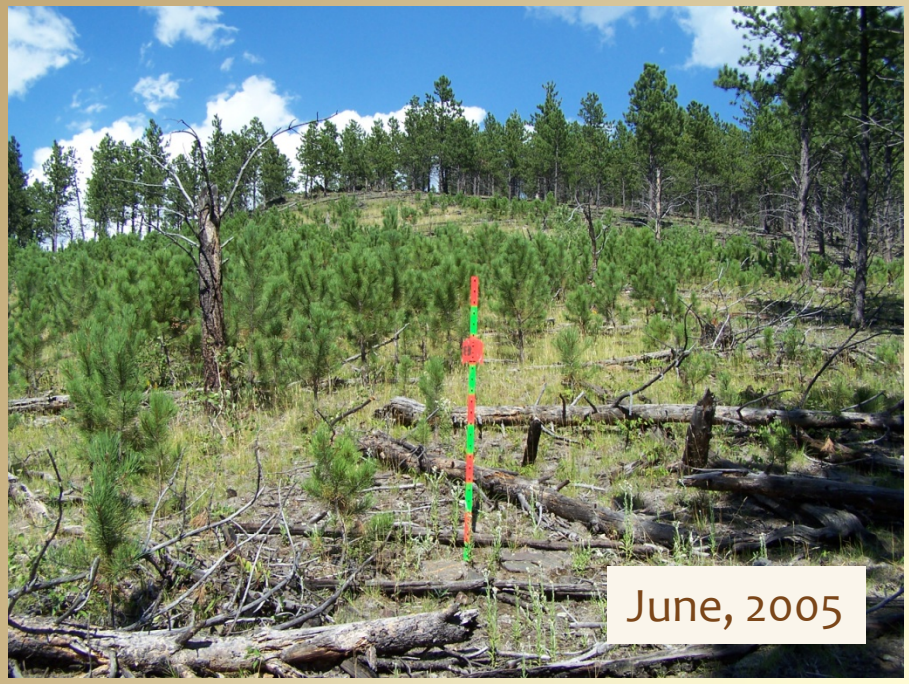
- Public and firefighter safety
- Protect values at risk
  - Natural resources
  - Private property
- Mountain Pine Beetle disturbance
  - Heavy surface fuel loading
  - Regeneration will most likely result in an even-aged stand prime to repeat the cycle
- Cost effective
- Pay me now, pay me later
  - Are we saving it up for the big show?
- It is the right thing to do

June, 2005


Surface fuels reduced
January, 2006

August, 2006

Canopy base height raised
June, 2009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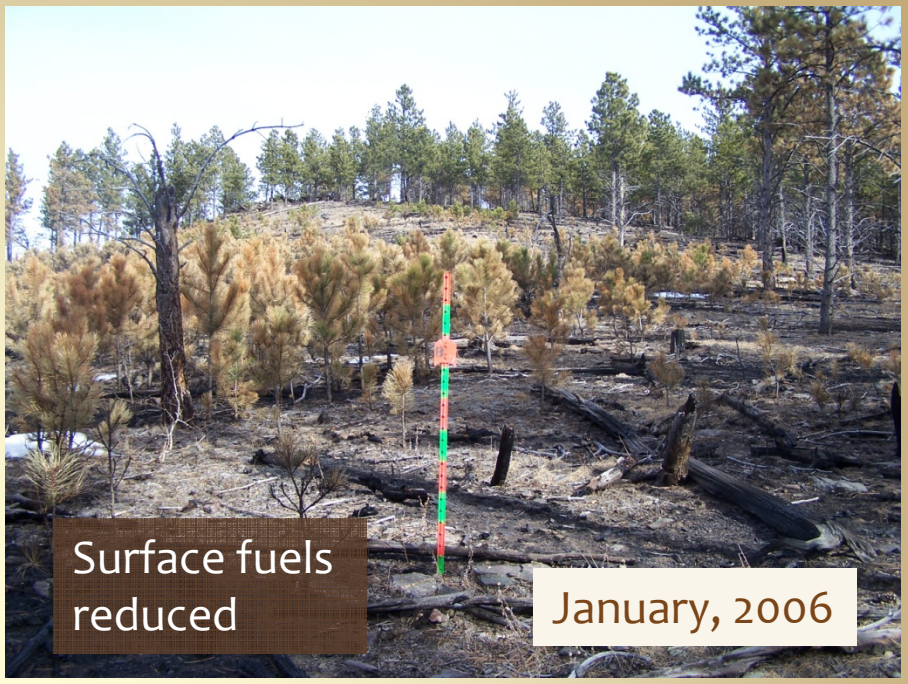
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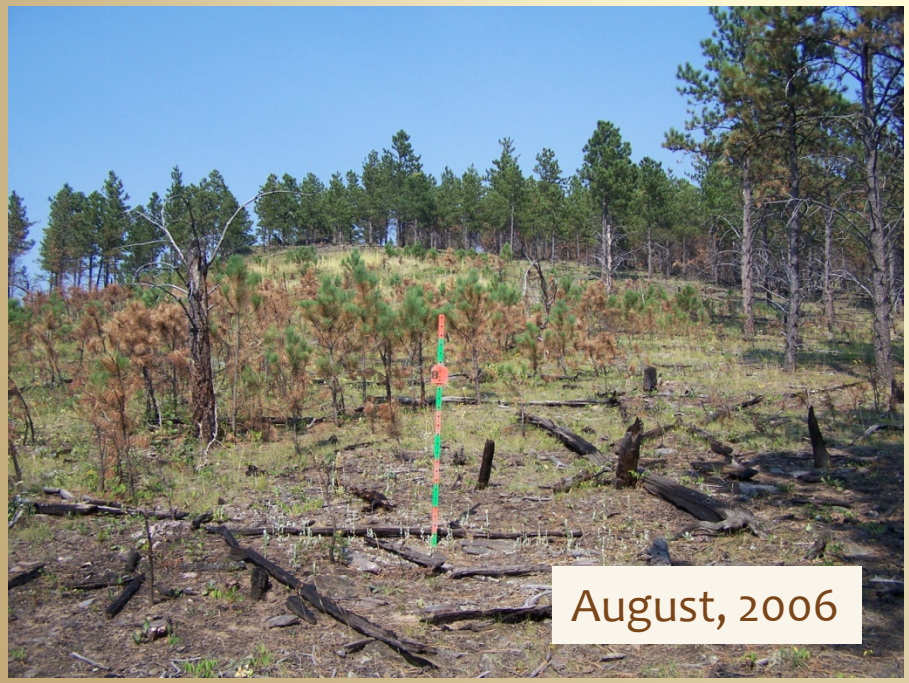
August, 2006

Pine regeneration thinned with fire
June, 2009