

WATERSHED RESPONSE – SADDLE FIRE  
AUGUST & SEPTEMBER 2011  
AND  
DISCUSSION OF USE OF FIRE AS A MANAGEMENT TOOL

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# The fire was managed for Natural Resource Benefits

The objectives of fire management for resource benefit include: fuel reduction, restoration of moderate fire regimes, ecosystem diversity, and reduced fire management costs.

- ▣ Fire managers were confident early in the fire season managing the fire for resource objectives was appropriate as large snow packs and June precipitation had left fuels in moist conditions.
- ▣ Later in the summer precipitation fell below averages, though temperatures were relatively cool.

# Fire Behavior, sometimes things don't go as planned

- ▣ By middle to late August we were in a statistically drier than normal summer (about the 10<sup>th</sup> driest on record in Missoula by then).
- ▣ By the end of September we were in the 7<sup>th</sup> driest summer on record in Missoula.

Fire behavior changed and the fire spread from Idaho into Montana due to high winds.  
A 33,494 acre fire results in...



A one day wind event causes patches of timber to blow down.



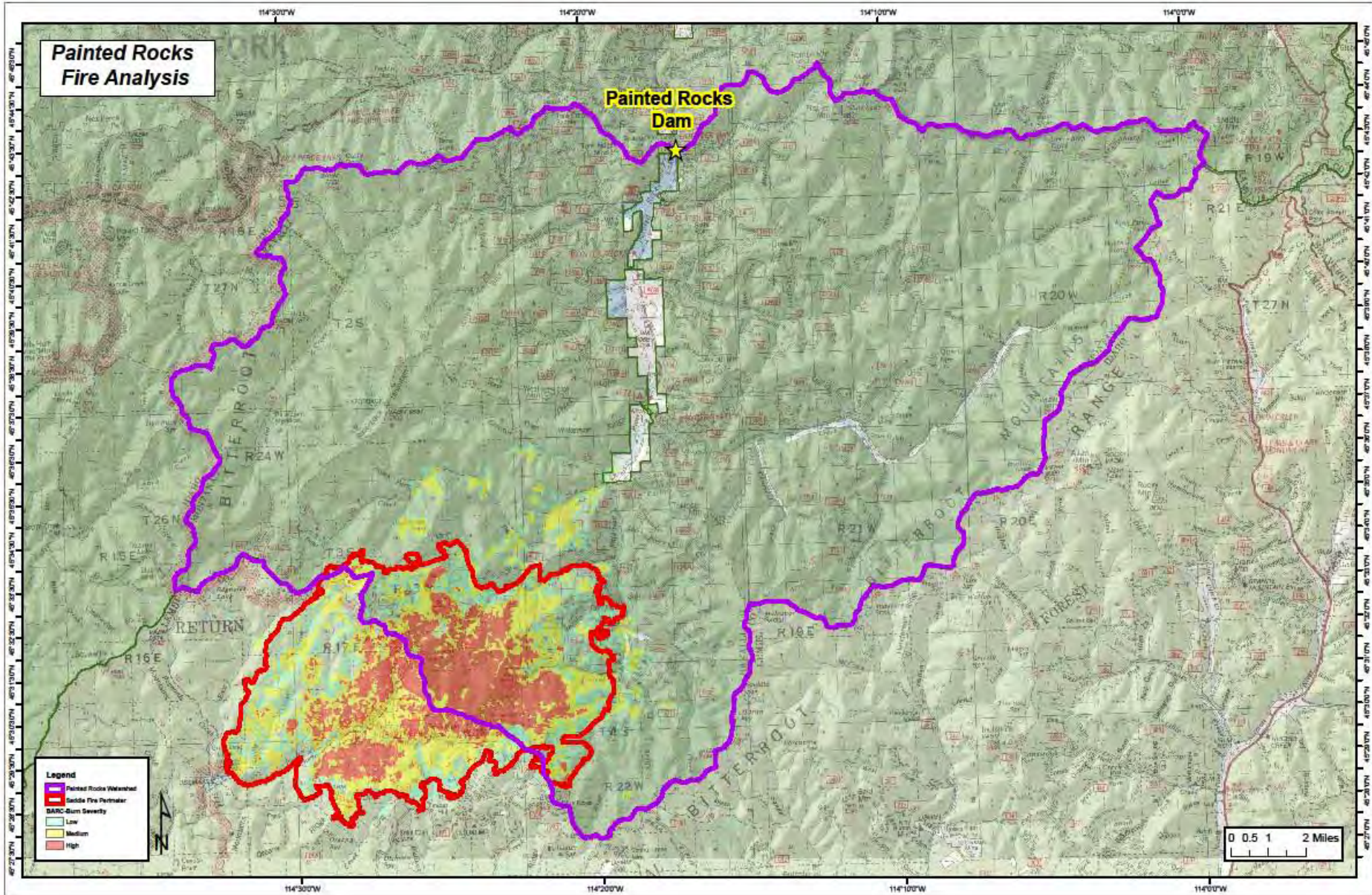
At one location, high winds scoured bark from trees.



The BAER Team quickly began assessment of post fire risks.



BAER Team Fire Severity Map showed that about 8% of the watershed above Painted Rocks Reservoir burned, and burned areas were 10–12 stream miles from the reservoir.





Stabilizing roads with deep road fills, that were now at risk of being washed out by post fire flood events, was given high priority. These can be initiation points for debris torrents.



Actions were taken quickly: larger culverts were installed and road cut and fill slopes were seeded and mulched.



Significant erosion of soils is anticipated until vegetative cover reestablishes. After two growing seasons following the 2000 fires in the Bitterroot National Forest, vegetation had recovered and generally provided over ~60% of the soil surface with protective ground cover.



# Risks of Flooding and Erosion

- ❑ Snow melt generally does not result in large amounts of post fire hillslope erosion and usually melts over a period of weeks. However, relatively infrequent rain on snow events can result in significant erosion, sedimentation, and flooding.
- ❑ Research has shown that high intensity convectonal summer storms can cause high levels of localized erosion and sediment transport when it occurs on sites with moderate or high burn severity.
- ❑ Convectonal storms tend to be short duration and generally cover less than 5 square miles.

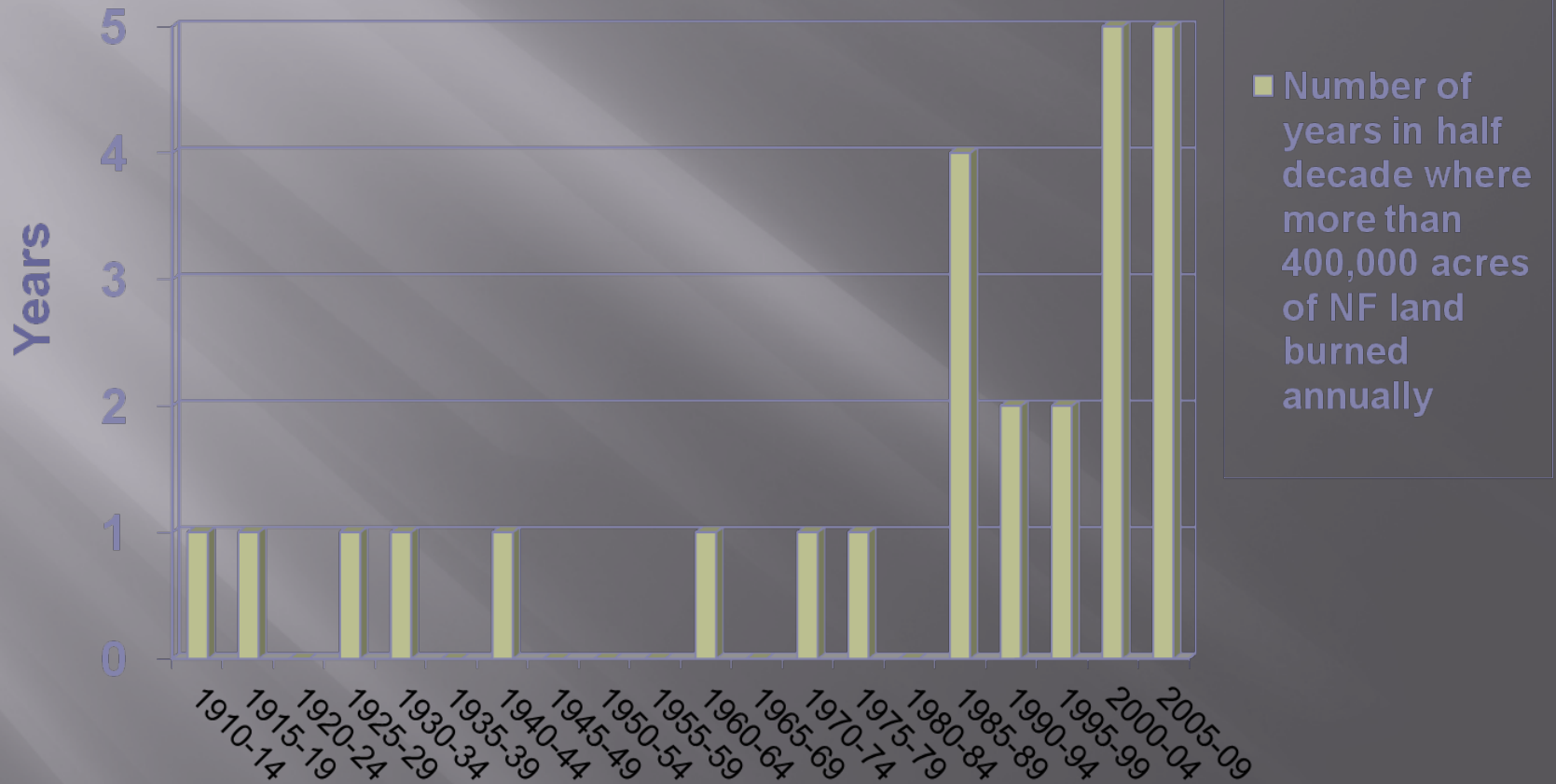
## So what are the chances of significant erosion, sedimentation, and flooding?

- ▣ Reasonably good, especially during the first few years following the fire.
- ▣ Research has shown that rainfall intensities of  $\sim \geq 0.5''$  in 30 minutes on burned slopes can result in significant erosion and sedimentation.
- ▣  $\sim \geq 0.5''$  in 30 minutes is between a 2 and 10 year event.

# Considering the risks, is managing fires for resource objectives appropriate?

- ▣ Yes, our climate is warming and fires in the western United States are becoming more frequent and larger.
- ▣ Using fire as a fuels management tool is the only realistic way of reducing stand densities across large western landscapes. We will not be able to mechanically harvest or thin such vast areas, particularly in Wilderness and Roadless Areas where mechanical treatment options are limited.

# Major Forest Service Fire Years



# Consequences of Fire Suppression

- ▣ Fire suppression has resulted in higher tree densities and heavy fuel loading.
- ▣ Climate change may increase the likelihood of conditions favorable for high severity fires that cover larger areas.



# Many landscapes in the western U.S. have increased tree densities

## Same View - northeast of Philipsburg, MT

### Circa 1908 and 1981



**Plate 16a (ca. 1906-08)** Fire Group 6: Moist Douglas-fir. Elevation 5,000 ft (1 524 m)  
Looking northeast from point now occupied by U.S. Highway 10A, 8 miles northeast of Philipsburg, Mont. Deciduous shrubs, herbs, and young aspen are evident in foreground and midground. Conifers on benchlands include Douglas-fir, ponderosa pine, lodgepole pine, and Rocky Mountain juniper. Open slope in distance was swept by a crown fire around the turn of the century.  
USGS photograph 29 by F. C. Calkins.



**Plate 16b (July 21, 1981)** About 73 to 75 years later  
Except for the portion of clearcut visible at right midground, the landscape above highway right-of-way is now covered by a dense stand of conifers dominated by Douglas-fir. Aspen have matured along edge of conifers, while those in competition with conifers are dying out. Shrubs, including buffaloberry and snowberry, are also deteriorating.  
Photograph by G. E. Gruell.

# Ekalaka Hills in southeastern Montana – What can happen after extended periods of fire suppression?

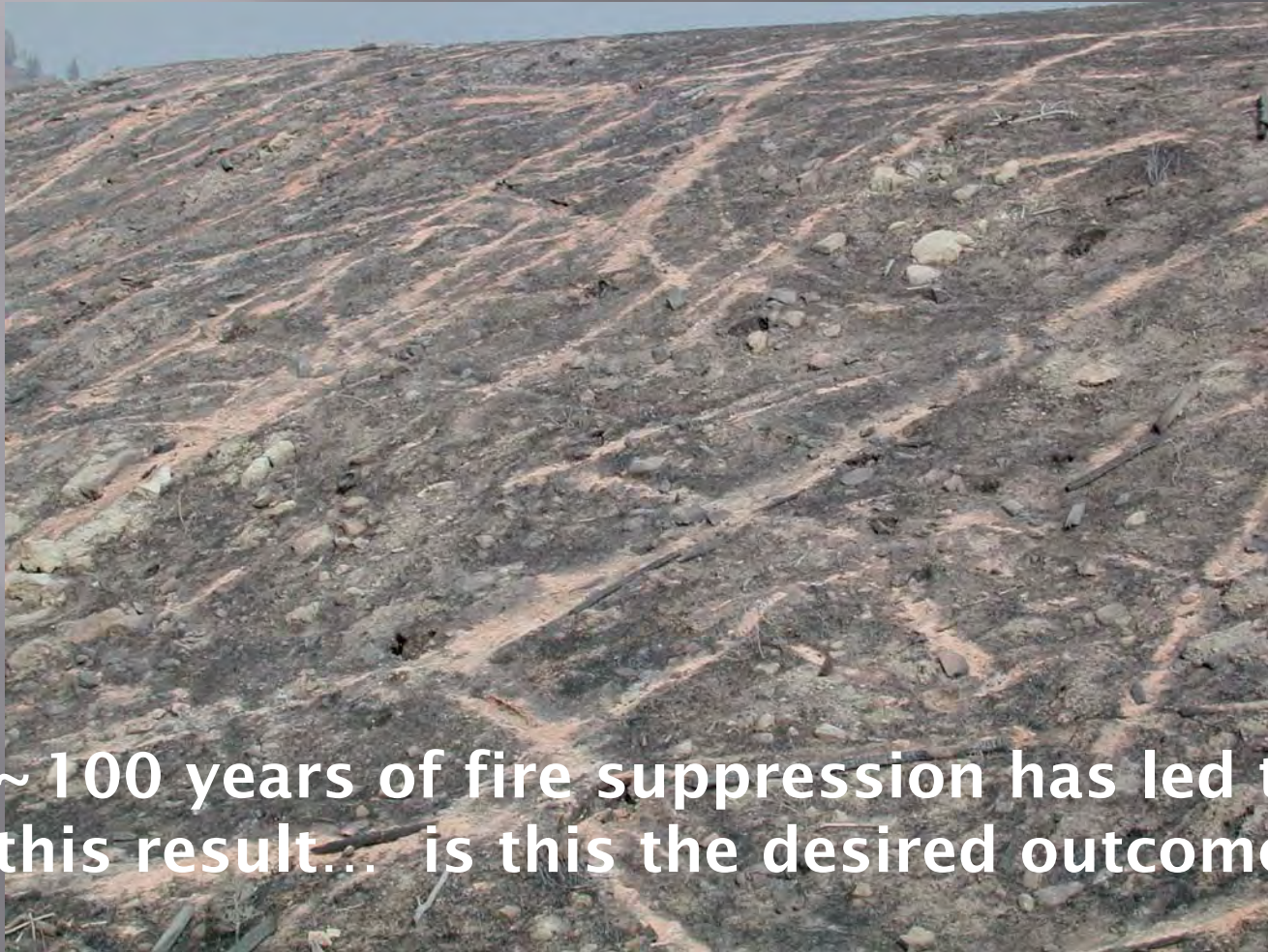
Persistent fuel loading after 1988 fire (photo from 2002)



This area had heavy fuels and burned in the 1988 Brewer fire. The area re-burned in the 2002 Kraft Springs Fire; because of remnant fuels the re-burn caused unusually severe fire effects.

*Picture from:* Dennis Sandbak, Silviculturalist, Custer NF

The 2002 Kraft Springs Fire burned the same area as the 1988 Brewer Fire  
*Note the position of the downed trees that were burned in 1988.*  
*Picture from: Dennis Sandbak, Silviculturalist, Custer NF*



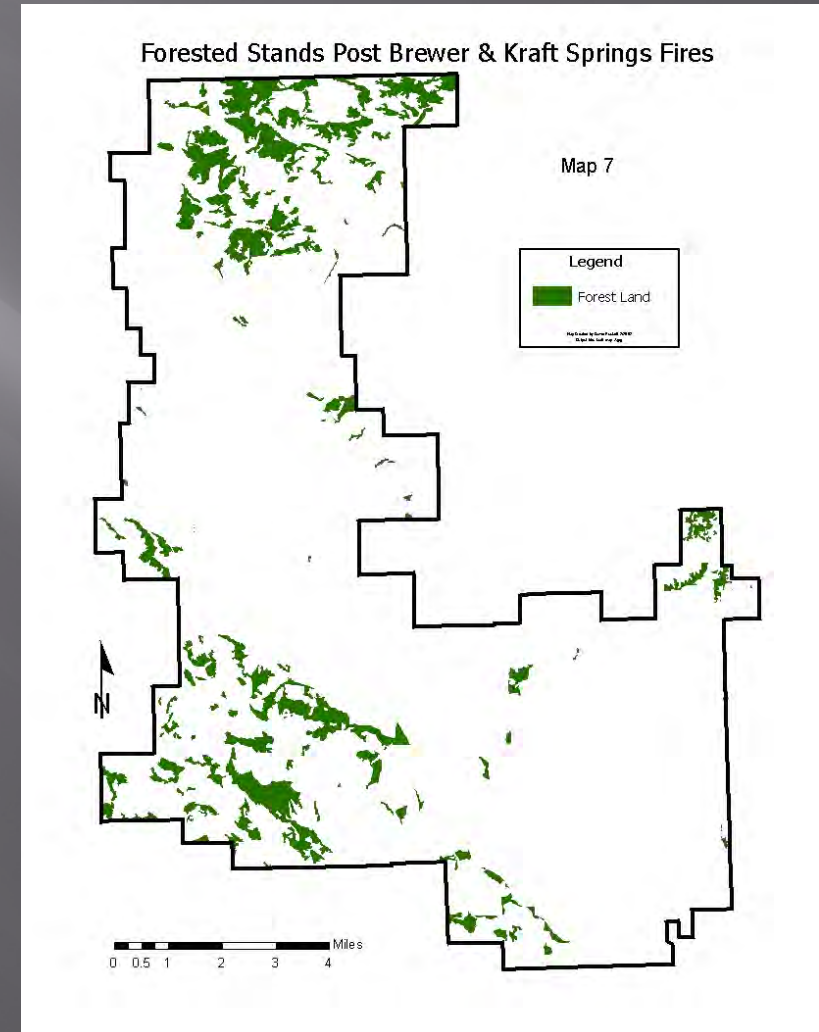
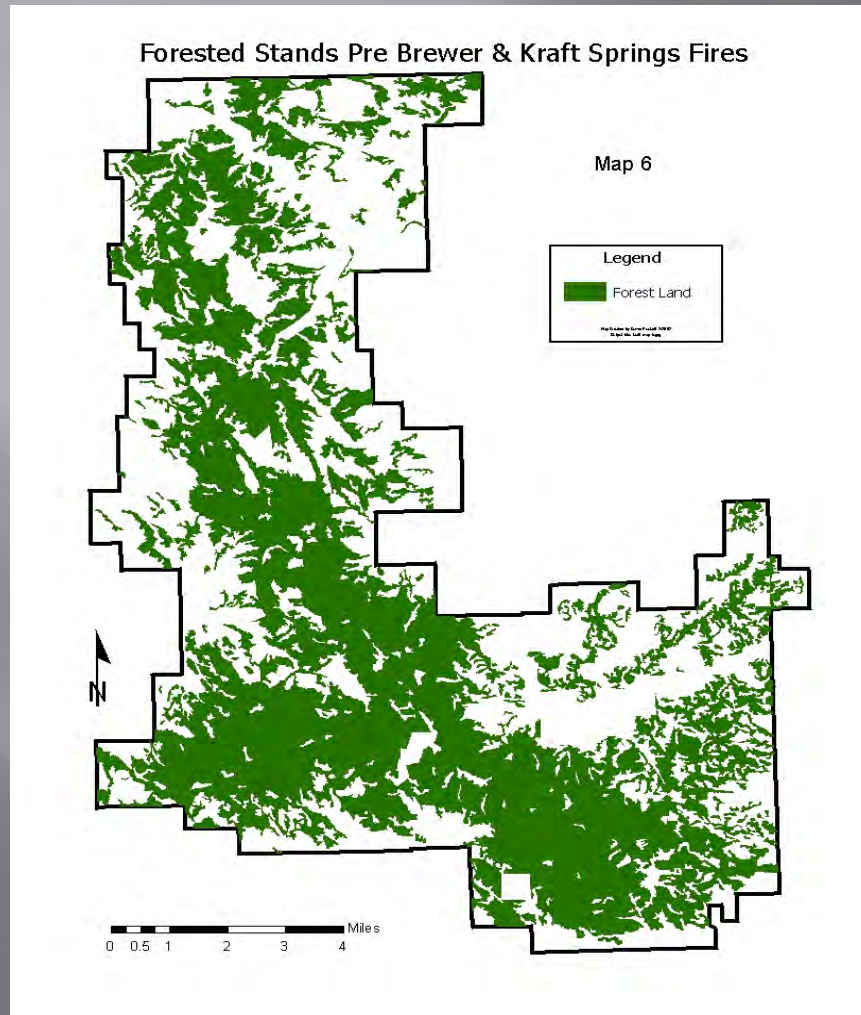
**~ 100 years of fire suppression has led to this result... is this the desired outcome?**

The re-burn took young tree re-growth before they were mature enough to produce cones.

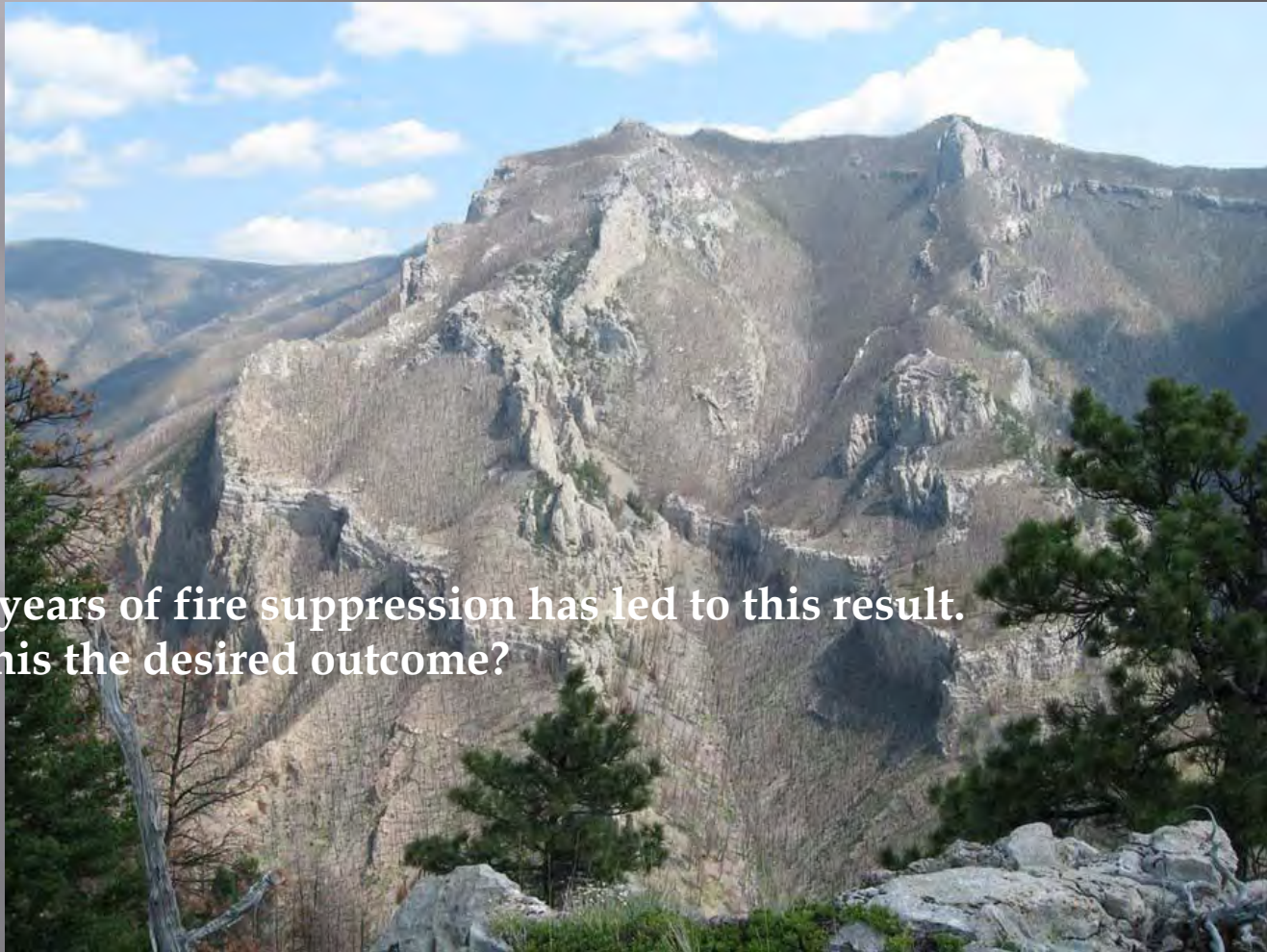
The Ekalaka Hills, Custer NF now has long term watershed cover type changes as a result of the second fire in 14 years.

Are dryer forest types more susceptible?...

Is climate change already significantly altering our landscapes? Time will tell....



# Severe Burn – 2007 Meriwether Canyon Mann Gulch is just to the north!



~100 years of fire suppression has led to this result.  
Is this the desired outcome?

# Meriweather Canyon Recreation Site accessible by boat on Holter Lake.



# The New Mexico Example

## The 154,682 acre Las Conchas Fire –

### Areas burned in 1997 and 2000 re-burned in 2011...



Had fire retained its natural role, forest stands that had 300+ trees per acre would have had only ~30 - 40.





Downed wood from past fires and any young regeneration was consumed over large areas.



Parts of Bandelier National Monument and the Santa Fe National Forest resemble a moonscape. One manager joked: “Bandelier finally has a handle on their fuels management...”



**~ 100 years of fire suppression has led to this result... is this the desired outcome?**

Los Alamos was evacuated  
for the second time in 11 years!



# The National Lab was again at risk...



Dreams were destroyed...



# Cochiti Canyon at Dixon Orchard High post fire flood risk!





# Using fire as a management tool is not risk free.... (Just outside of Superior—in WUI)





But it can be conducted successfully;  
e.g. Superior Ranger District, Lolo N.F.



Results can be easily seen on the  
Lolo National Forest near Frenchtown.



# Benefits of an enlightened fire management policy

- ▣ Appropriate fire management (when conditions allow) can improve landscape resilience:
  - Smaller fires with less severe effects, because there is more of a mosaic
  - Improved conditions for species such as white bark pine
  - Improved elk habitat
  - Improved fire fighter and public safety
  - Fewer homes burned in the urban interface
  - Reduced loss of valuable timber

# Benefits Continued

- Reduced impacts to fish and wildlife
- Reduced flooding and debris torrents and associated damage to infrastructure and private property
- Reduced risk of wildfires adversely affecting municipal watersheds and water supplies (Bozeman's and Helena's watersheds are currently at risk to large high severity fires)
- Reduced cost over time

# Resource Benefit Fire Management

- Managing wildfires will never be risk free but is an important tool for managing the landscapes and for protecting public, firefighters, and property.
- Climate Change will only increase the likelihood of extreme fire behavior.