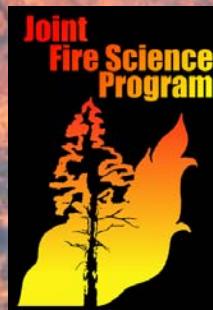


# Restoration and Fire at Blacks Mountain Experimental Forest: Lessons from the Cone Fire.

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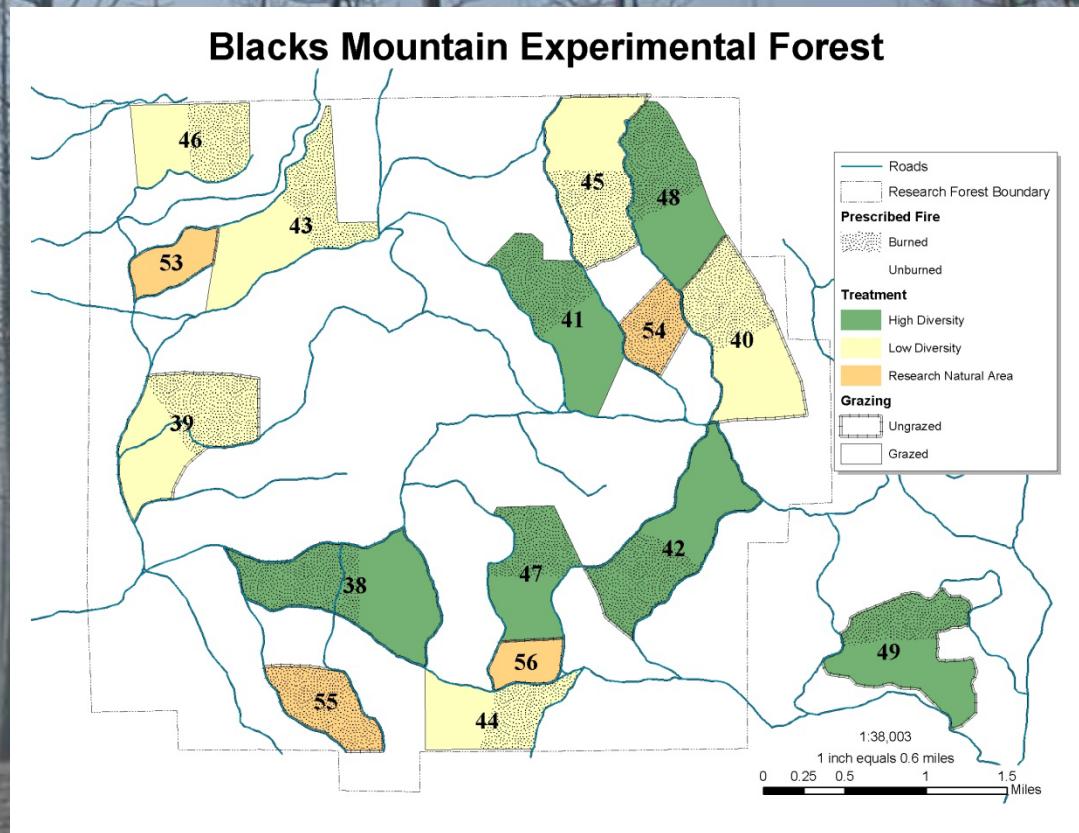
Pacific Southwest Research Station



- From 2000 to 2009, 85 million acres burned in the United States...
- What does that cost?
  - USFS+BLM+CalFire = \$3Billion annually (suppression only, doesn't include resource damage)

*A billion here, a billion there, pretty soon you are talking about real money.*  
Everett Dirksen

- On September 26, 2002 the Cone Fire burned 2000 acres of eastside pine in NE California. Most of it on Blacks Mountain Experimental Forest.



What did that cost?

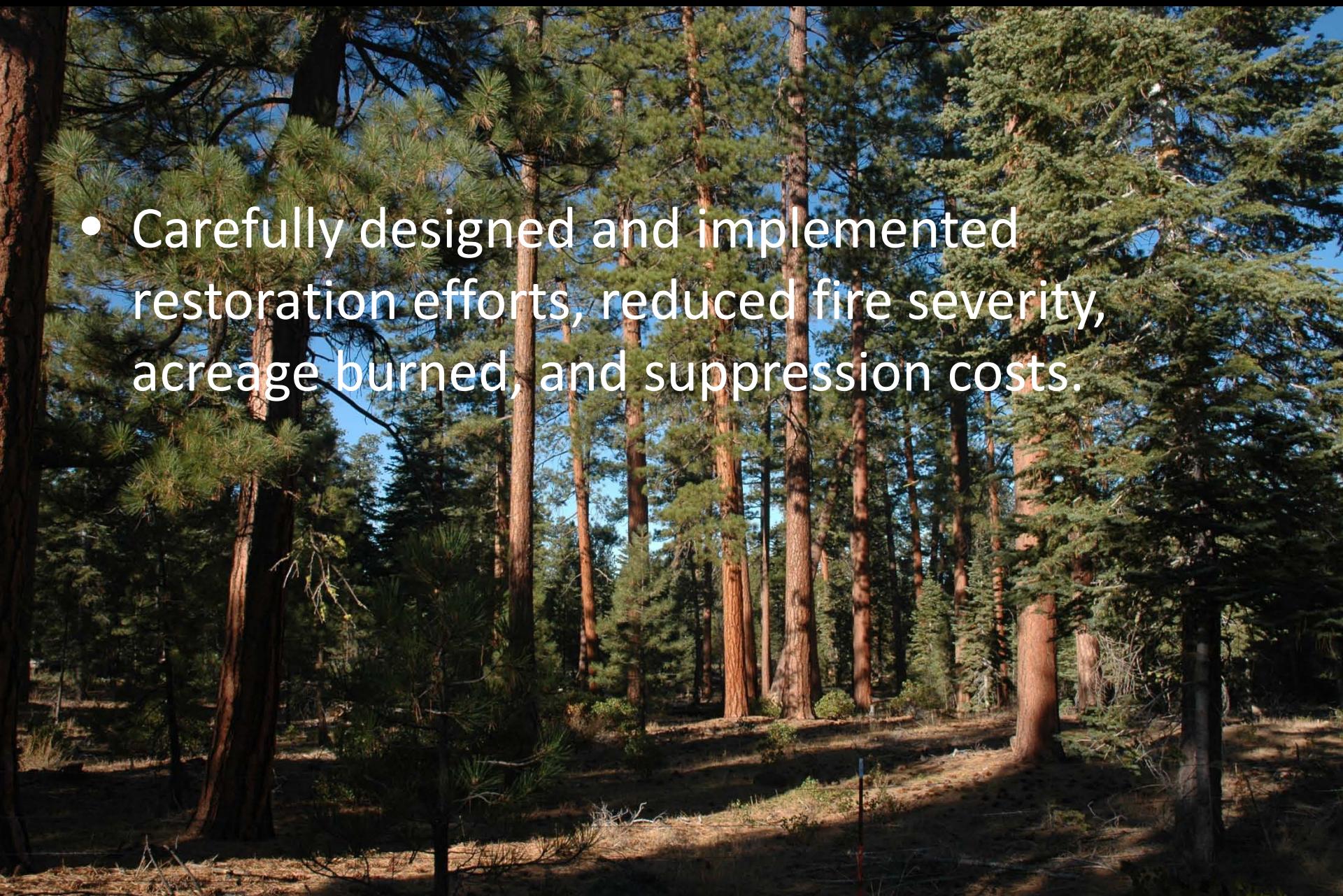
\$3.46 million (\$1,730/acre).

1,400 acres of 100-year-old pine research forest lost.

Damaged 3 permanent research plots.

It could have been a worse...

- Carefully designed and implemented restoration efforts, reduced fire severity, acreage burned, and suppression costs.



# At Risk

A photograph of a forest scene. In the foreground, several tall, slender pine trees stand in a row. Behind them, the forest continues with many more trees of similar height and density. The sky above is a clear, vibrant blue, suggesting a sunny day. The overall impression is one of a healthy, established forest ecosystem.

- 1990 Initial Conditions at BMEF
  - 200-450 trees per acre
  - Dense ladder fuels, fuel continuity
  - White fire encroachment
  - Accelerated mortality of the “old-growth”
- Led to the establishment of a large scale research project focused on stand structure and fire.

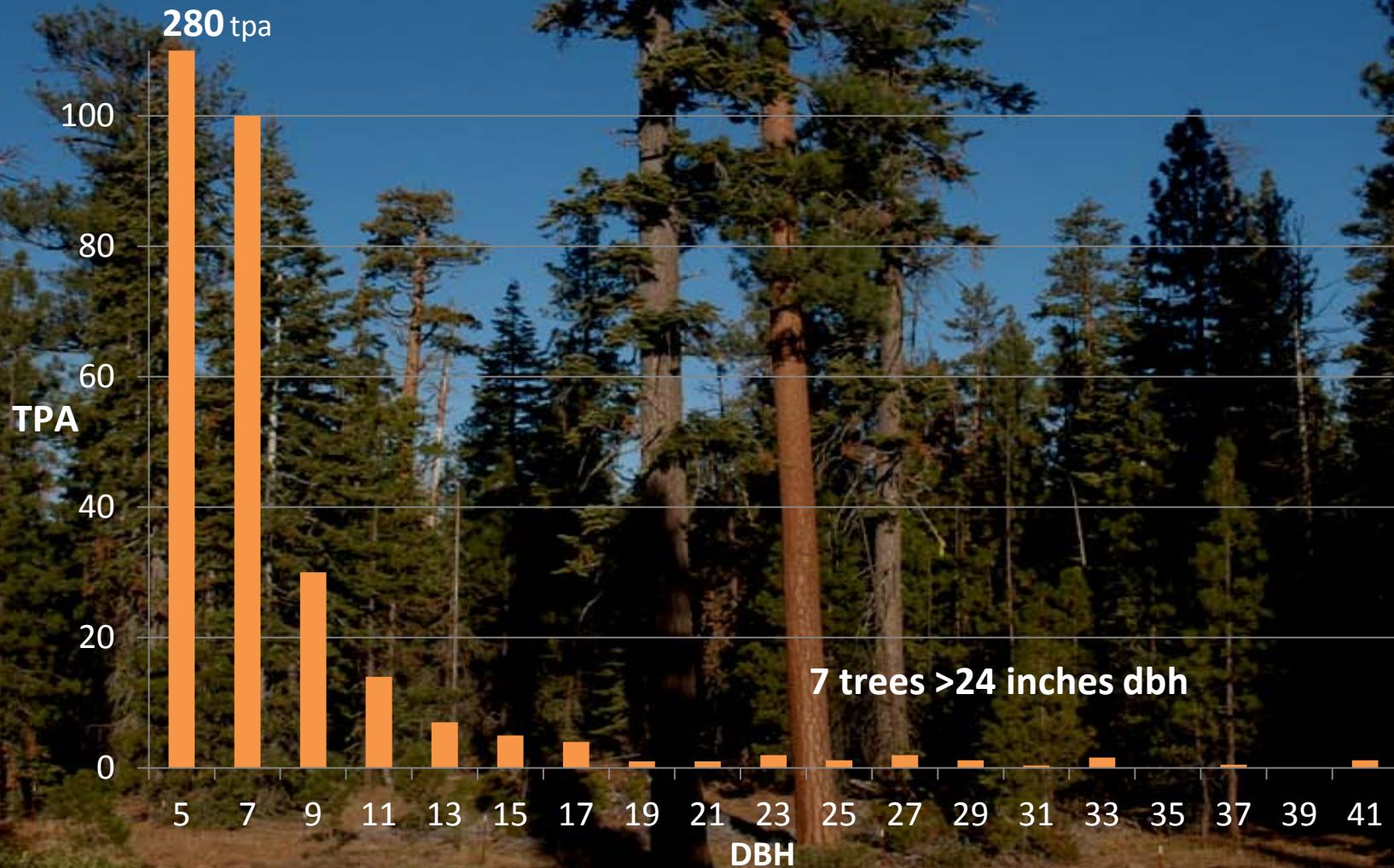


- Restoration at BMEF
  - High Diversity vs Low Diversity
  - With prescribed fire vs without prescribed fire
- Not restoration as a primary goal



# At Risk

Pre-treatment distribution



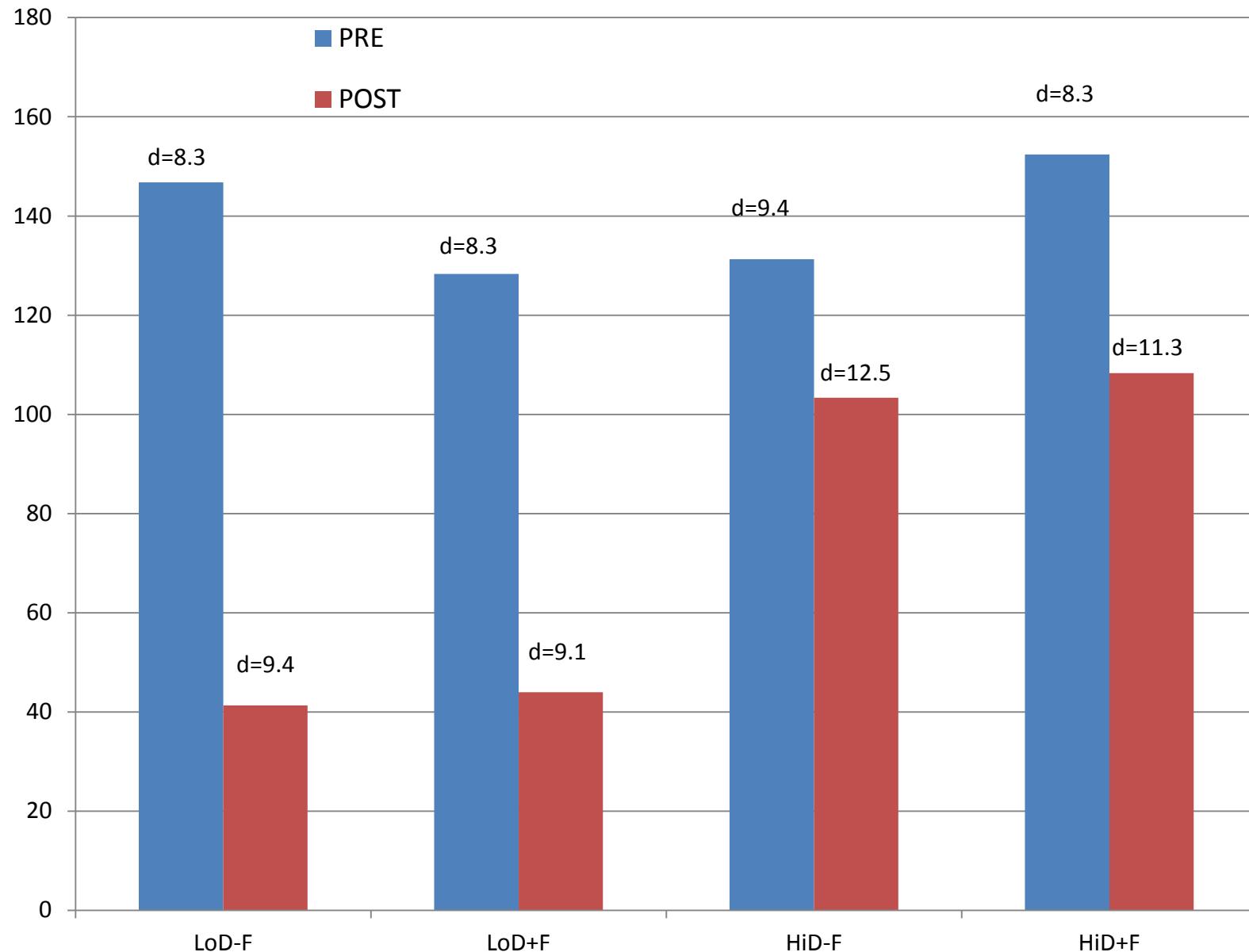
## High Diversity Post-treatment distribution



## Low Diversity Post-treatment distribution



### Basal Area



An aerial photograph showing a large forest fire. A thick, white plume of smoke rises from a fire line in the center-left of the frame. The surrounding forest is a mix of green and brown, indicating areas of live and dead vegetation. The smoke is billowing upwards and to the right.

**10 Hour fuels = 2% Fuel Moisture**

**1000 Hour fuels = 5% Fuel Moisture**

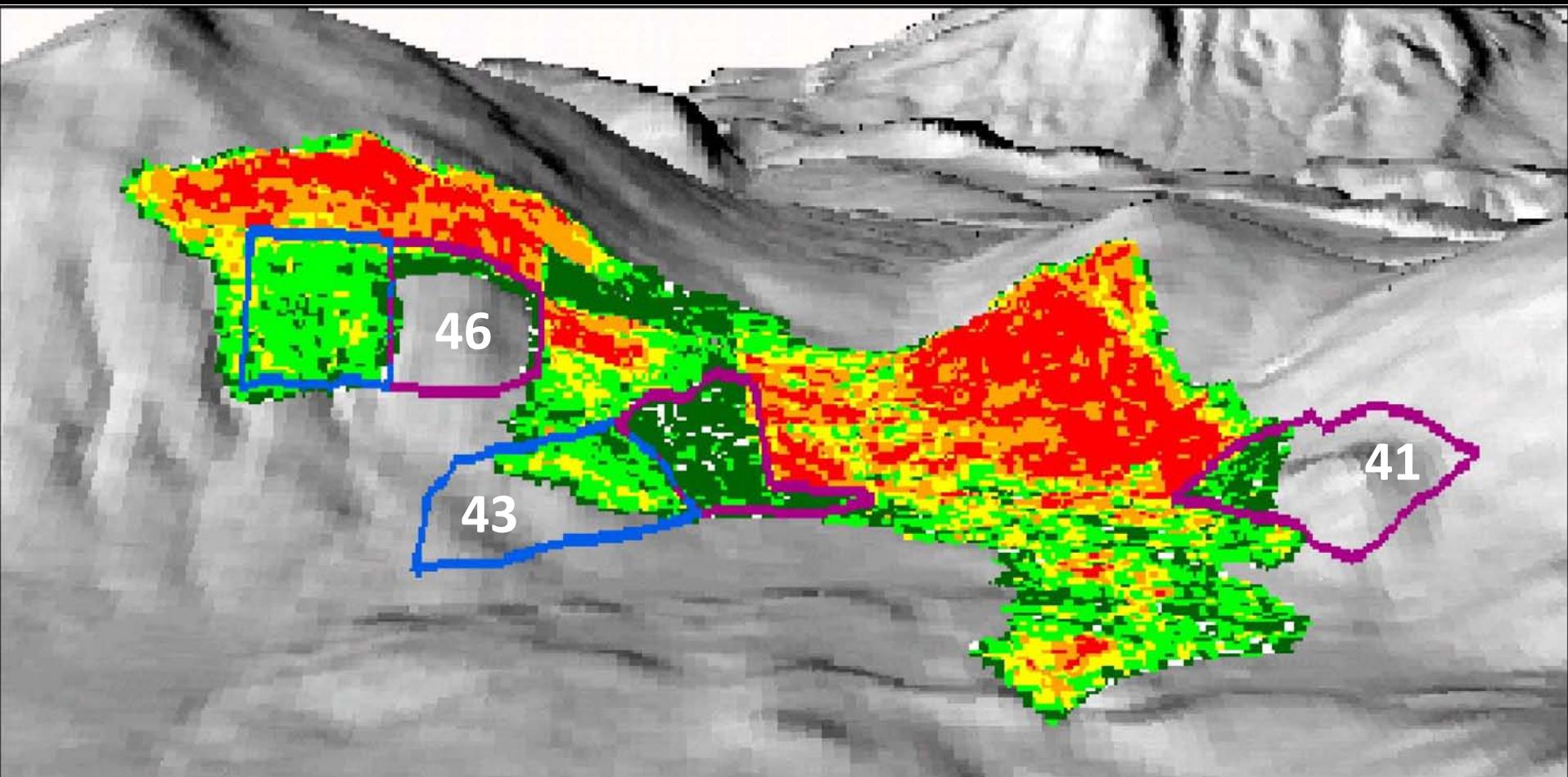
**Relative Humidity=4% → 31%**

**Winds 4-10 mph, SW→N**

1 1:5



1 1:50PM

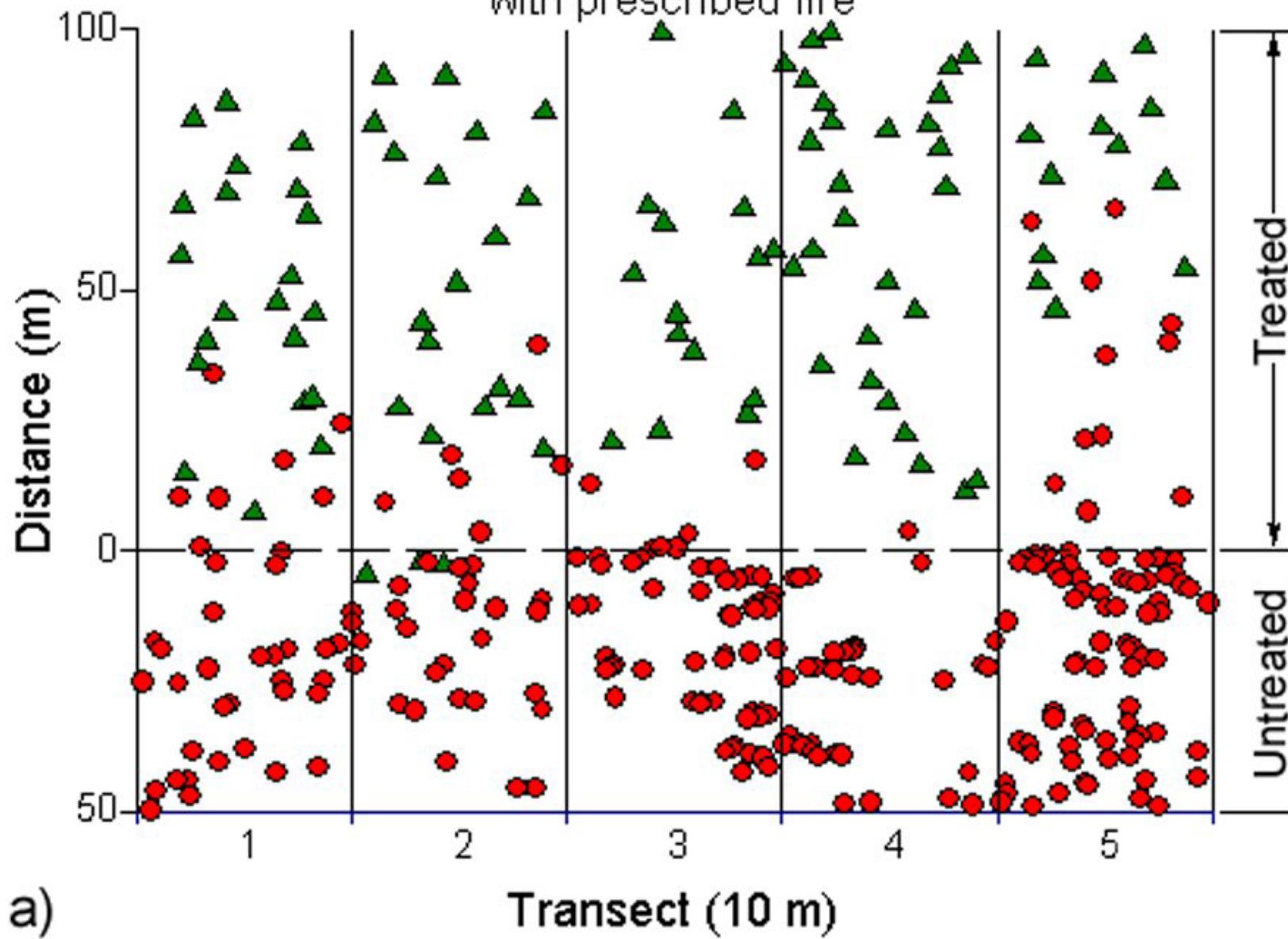


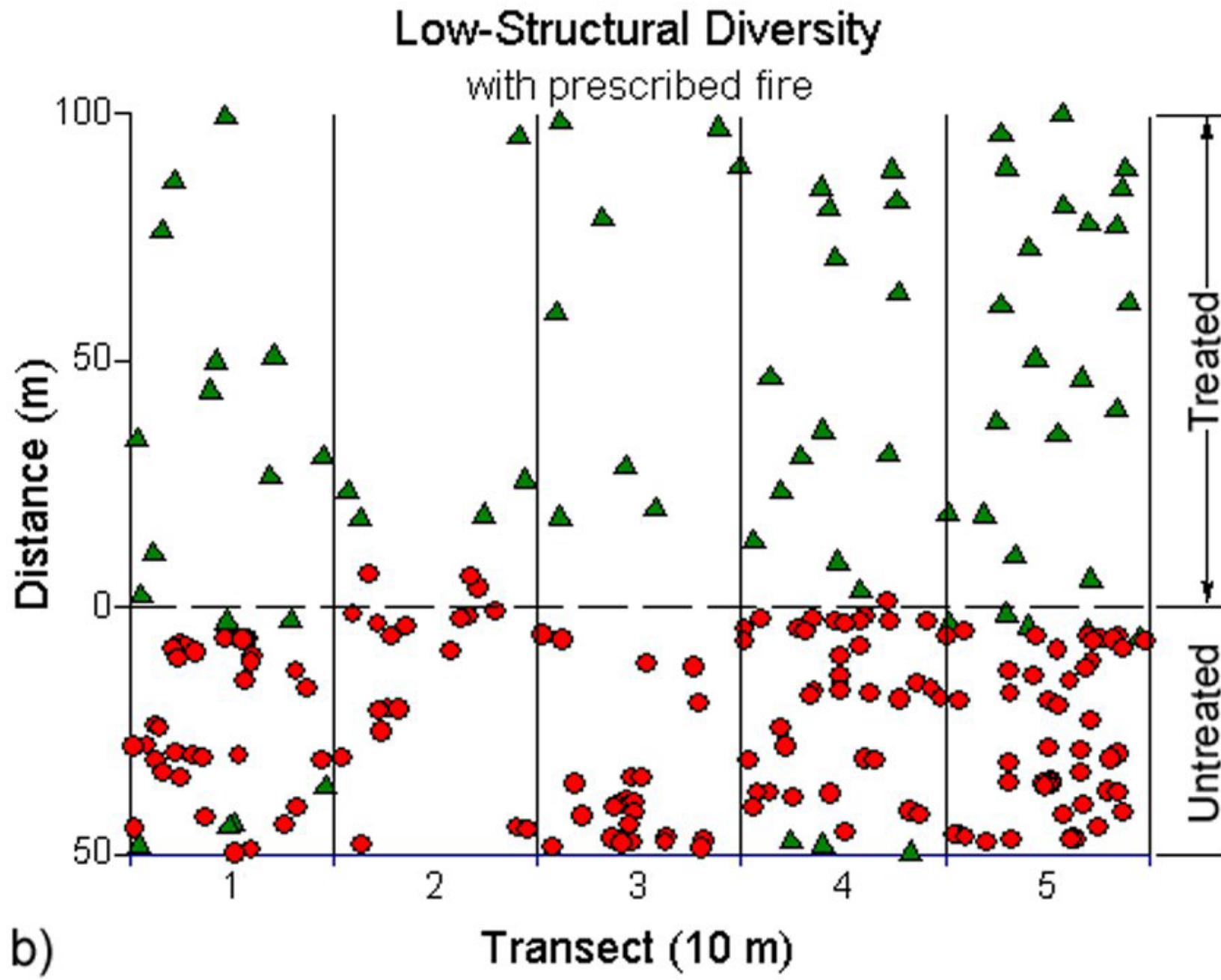


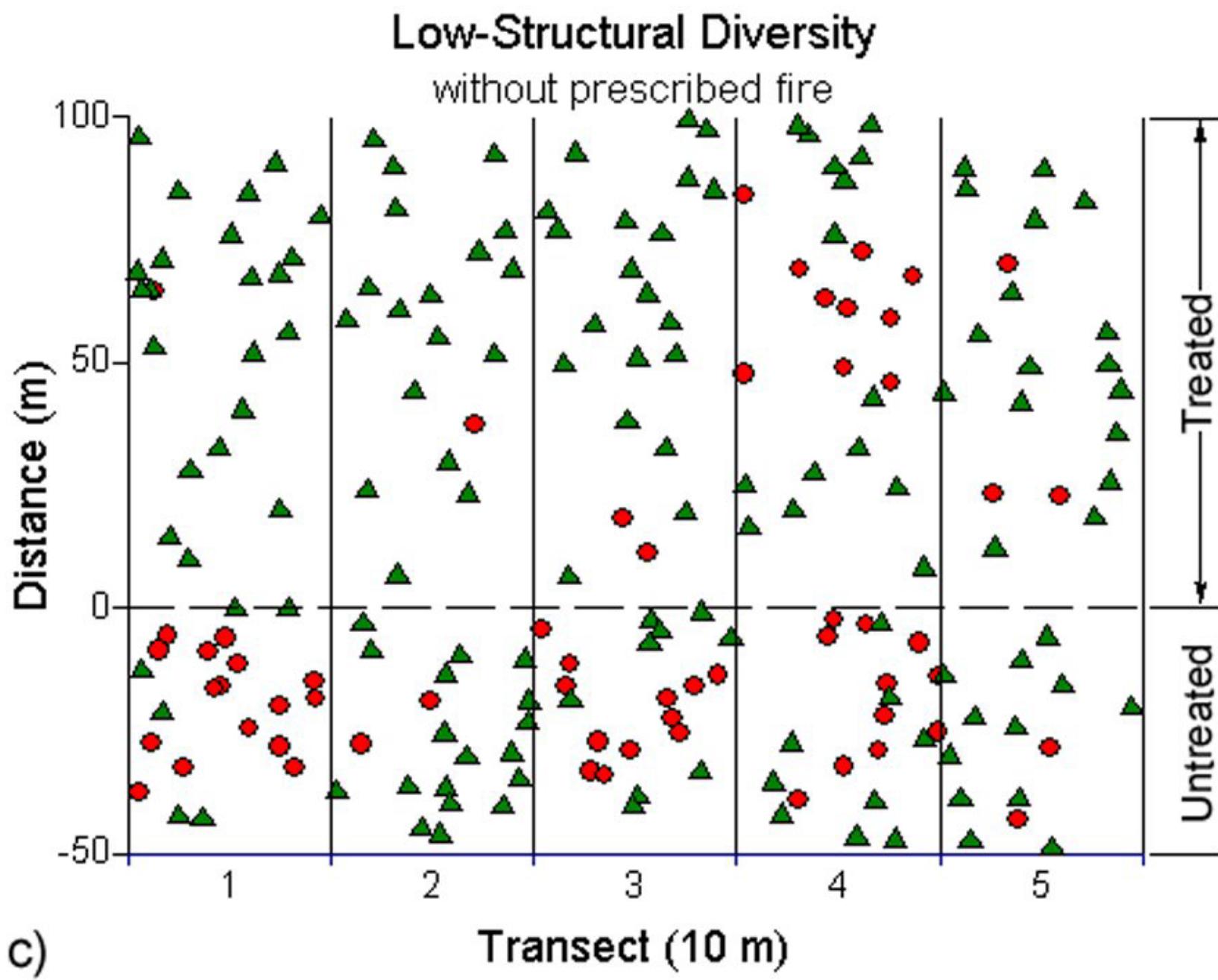
Fire: Untreated Area

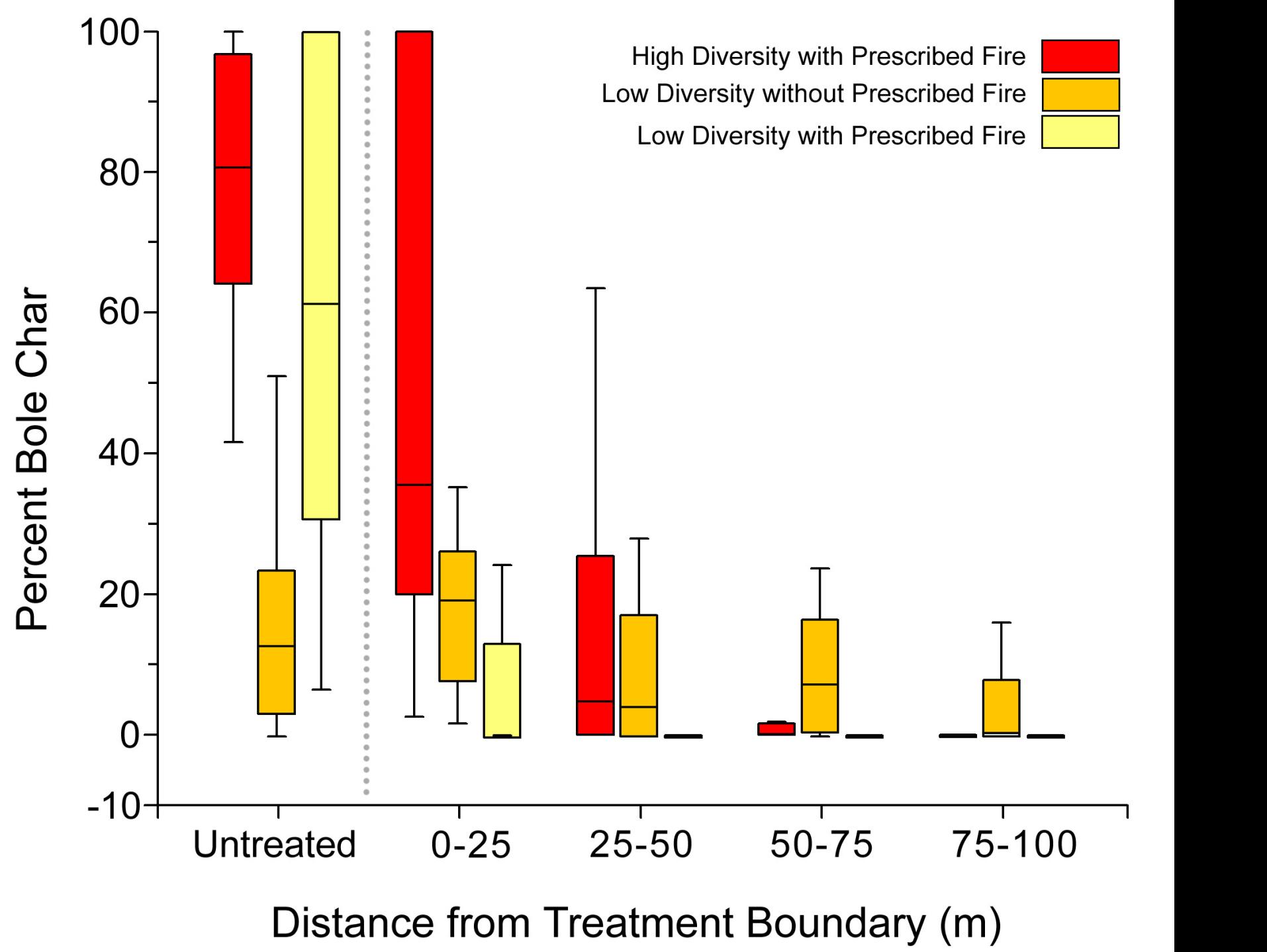
# High-Structural Diversity

with prescribed fire







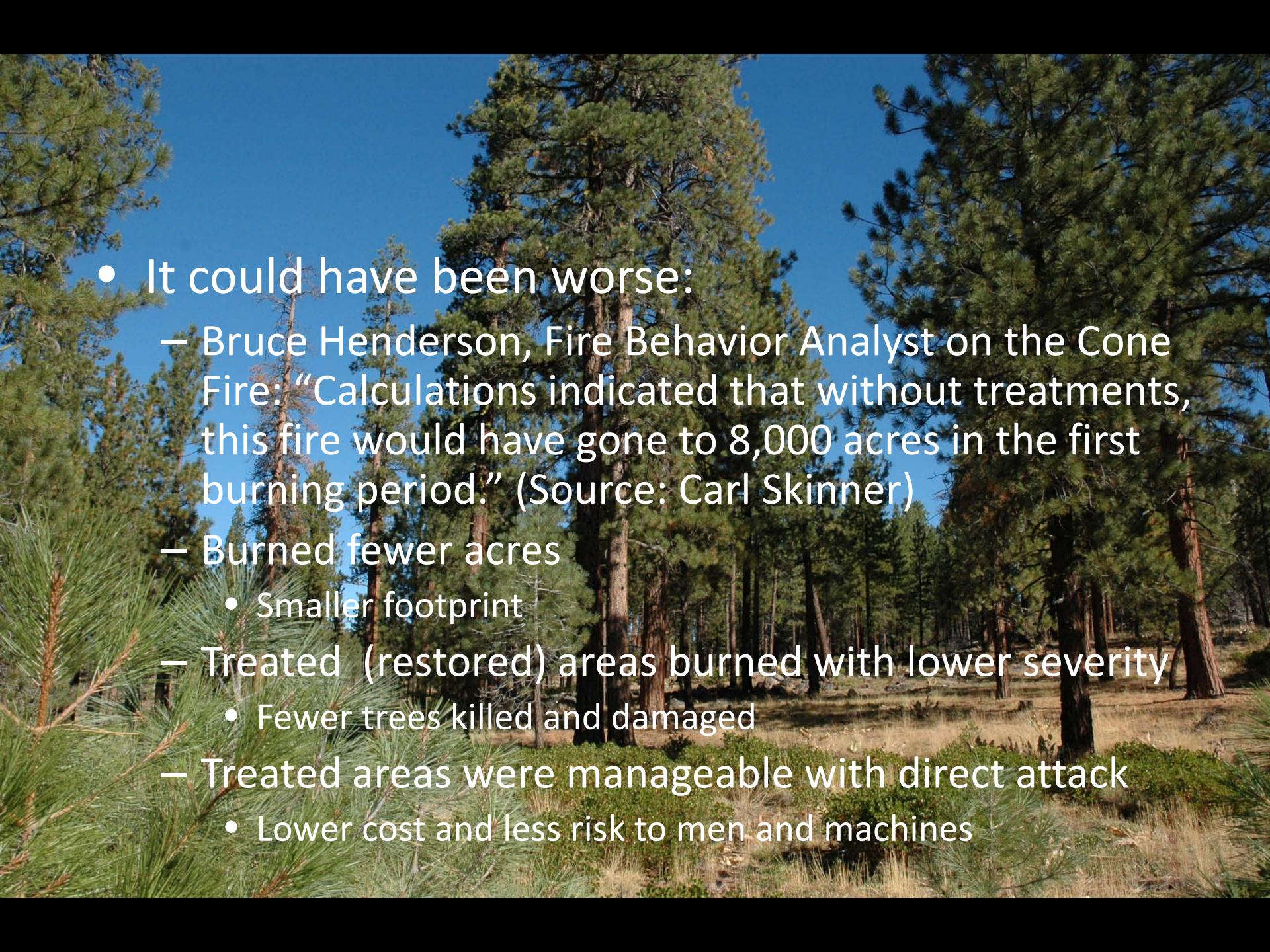










- 
- It could have been worse:
    - Bruce Henderson, Fire Behavior Analyst on the Cone Fire: “Calculations indicated that without treatments, this fire would have gone to 8,000 acres in the first burning period.” (Source: Carl Skinner)
    - Burned fewer acres
      - Smaller footprint
    - Treated (restored) areas burned with lower severity
      - Fewer trees killed and damaged
    - Treated areas were manageable with direct attack
      - Lower cost and less risk to men and machines

- 
- A photograph of a forest scene. In the foreground, there is a mix of dry, yellowish-brown grass and low-lying shrubs. Behind them, a dense stand of tall, slender pine trees reaches up towards a clear, vibrant blue sky. The pine needles are a bright green color. The overall scene is one of a healthy, undisturbed forest ecosystem.
- Carefully designed and implemented restoration efforts, reduced fire severity, acreage burned, and suppression costs.

