Silvicultural Tools for Forest Restoration

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Today's Lineup

USFS

☐ **What you have**

☐ **What you want**

☐ **Which tools you use**

Intervention Silviculture
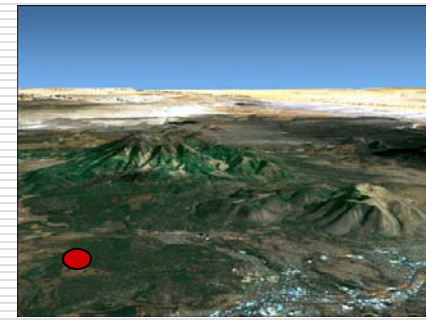
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Current Condition

Dry-conifer forests face unprecedented risk

- **the physical reality**
- **the scope**

Scope

Stands to landscapes

---------- 1/3 ---------- 2/3 -----------

Stands only

Be strategic

Everything's good

Remember TIME and "impacts"!

Current Perspectives

☐ **Smokey Bear vs. "Sparky Bear?"**

  ◼ **WUI vs. wildlands**
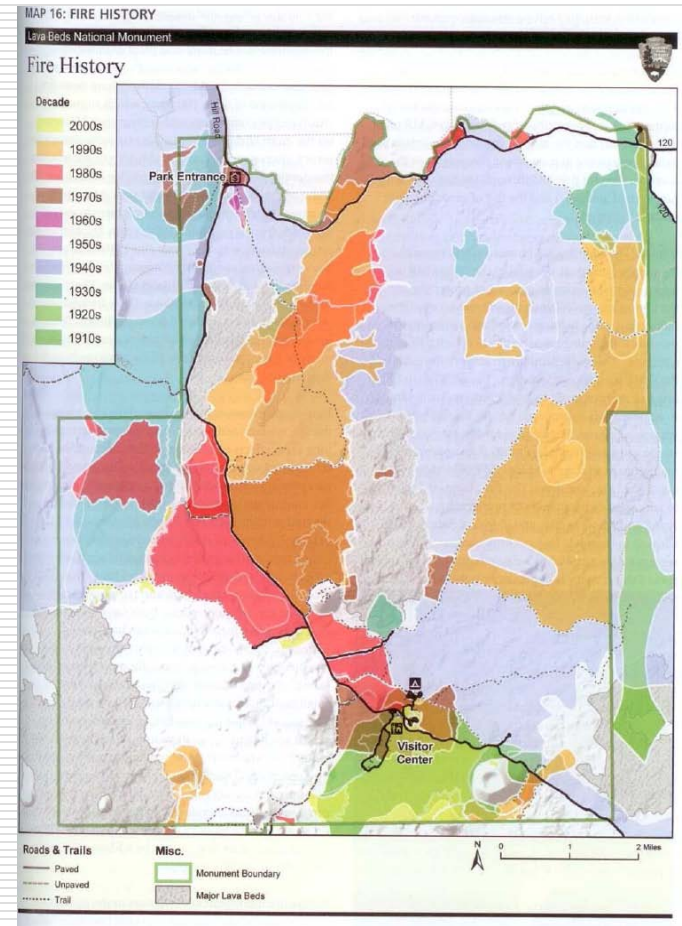
  ◼ **Timber vs. forest**

☐ **Cultural landscape**

SMOKEY SAYS—
**Care will prevent
9 out of 10 forest fires!**

Current Perspectives

- ☐ **Control and denial**
- ☐ **Frequency**
  - ■ **Lifetime/career**

Forest Service
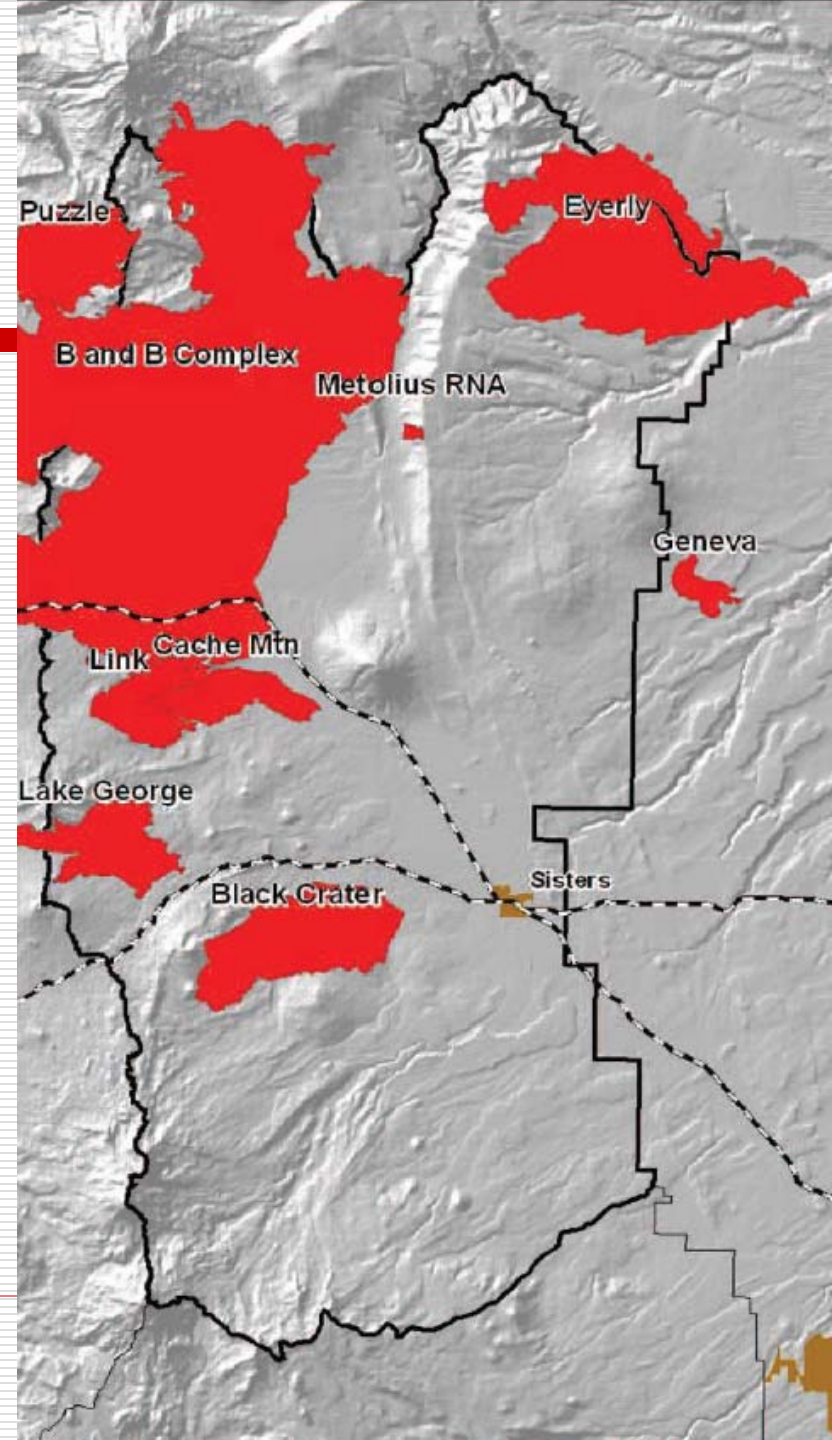

Lava Beds NM

Scope

Simple math

Restoration Tools

☐ **Mechanical harvest**

- ■ **"Thinning" (ERI is a free thinning)**
  - ▪ **Mosaic thinning**
- ■ **Multi-aged (or uneven-aged)**
- ■ **Group selection**

✓ **Fast**

✓ **Exact**

Unnatural & *expensive*

Implementation Guides

Mechanical harvest

- ☐ **Old trees and diameter limits**
- ☐ **Residual density targets**
  - ▪ **Diameter distribution**
  - ▪ **Growing space allocation**
- ☐ **Spatial pattern and variability**
  - ▪ **Regeneration**
  - ▪ **Range of condition likely desirable**
  - ▪ **"Muffins"**

Restoration Tools

- ☐ Mechanical harvest

- ☐ **Prescribed fire**
  - ■ **Cool season (initially)**
  - ■ **Repetition (7+) if burn only**
  - ■ **Fine surface fuels**

- ✓ **Natural**
- ✓ **Necessary**

Chaotic

Implementation Guides

Prescribed Fire

- ☐ **Old tree protection (?)**
- ☐ **Season and intensity of burn**
  - ▪ **Ecological effect**
- ☐ **Spatial continuity**
  - ▪ **"Muffins"**

Manager ignited fire will be limited

Restoration Tools

☐ Mechanical harvest

☐ Prescribed fire

☐ Vegetation Control

- Herbicides (shrubs)

Fast, exact and cheap

✓ Selectivity

Constraints

- Seeding

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Implementation Guides

Vegetation control

- ☐ **Available growing space**
  - ▪ **Dry sites**
- ☐ **Target/track exotics vs. natives**
- ☐ **Spatial pattern**
  - ▪ **Regeneration**

Restoration Tools

- ☐ Mechanical harvest
- ☐ Prescribed fire
- ☐ Chemical
- ☐ **Combination**
    - ▪ **Order?**
    - ▪ **Meta-analyses**

1. **Meaningful** target (e.g.,"80-80-20 rule")
2. **Heterogeneity**

A. MOUNT JEFFERSON, FROM GRIZZLY FLAT.

Treatment Impacts

- ☐ Ecology – process restoration
- ☐ Fuels and fire behavior
    - ☐ Wildland-urban interface
- ☐ Visual aesthetics
- ☐ Water and snow dynamics
- ☐ Disturbance agents/dynamics
- ☐ Habitat dynamics
- ☐ Product flow – old and new (biomass)

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Adaptive Management

- ☐ **Uncertainty is not a call for inaction**
  - ☐ **"Right" direction – Leopold**
- ☐ **Manage by vision, not constraint**
- ☐ **Embrace the mistakes, the uncertainty, the variability, the muffin**
- ☐ **Monitor and learn**
  - ☐ **Individually and by collaborative group**