
California
Tahoe
Conservancy
Monitoring
Plan

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  - –2-year monitoring grant awarded
- California Tahoe Conservancy Crews
  - –Data collection

Monitoring Objectives

- Understand the short- and long-term effects of restoration efforts
- Compare choices made to alternatives
- Provide data for use in modeling future forest conditions
- Inform future management decisions.


Were the Restoration Objectives Met??

Restoration Treatments

- Fuels treatment: Hand thinning of burned and unburned parcels in the Angora burned area.
- Salvage harvesting: Removal of burned trees and vegetation with the burned area
- Revegetation: Planting and natural recruitment of new trees and other vegetation within the burned area
- Erosion control: Installation of straw wattles, coir logs, silt fences, contour logs, and mulch to stabilize soils exposed by the burn.

Restoration Objectives

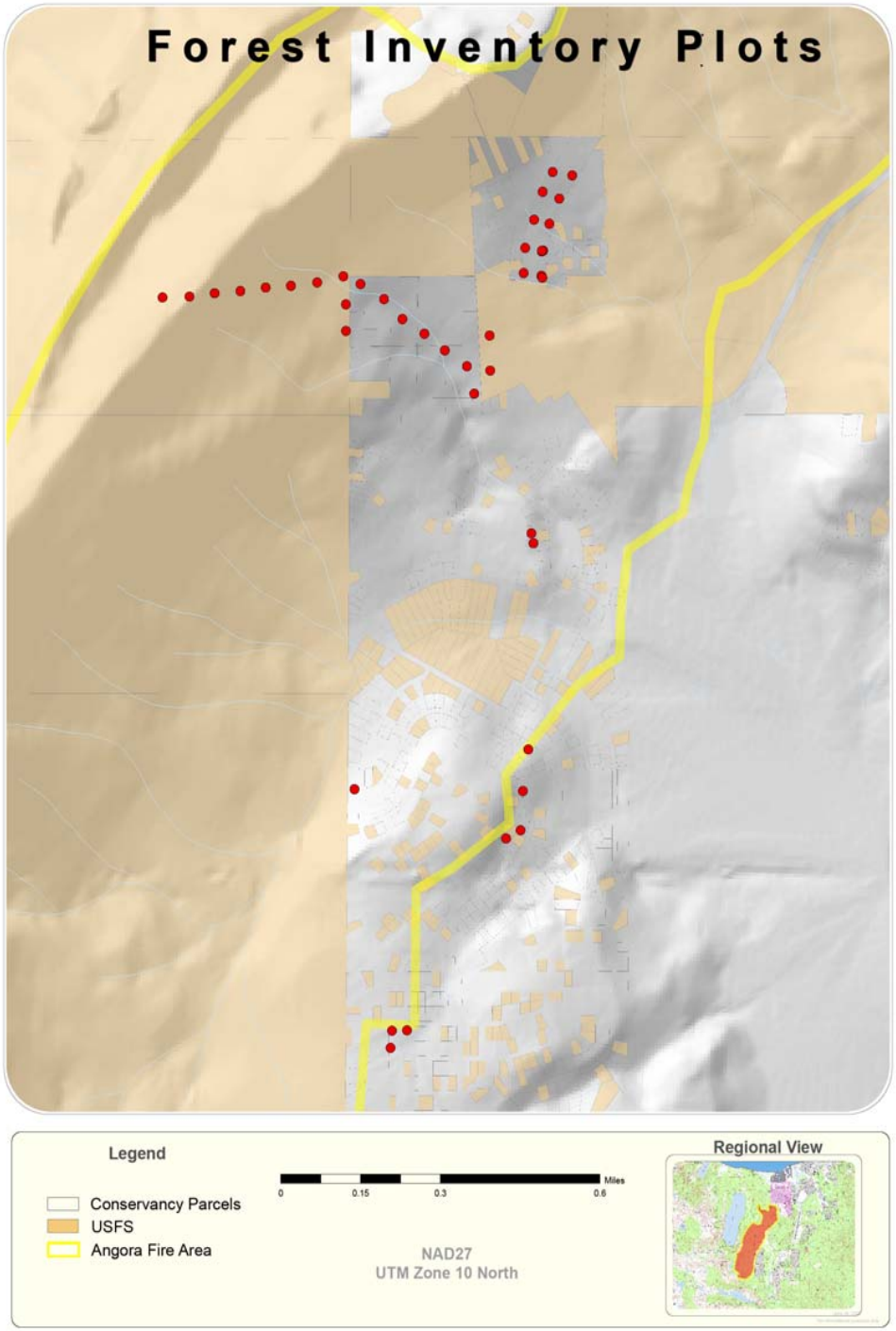
- Accelerate development of a healthy forest
- Reduce fuels accumulation on forested lands
- Increase vegetative ground cover and desired species

Restoration Objectives (cont.)

- Re-establish seedlings
- Avoid soil impacts from logging equipment
- Minimize soil erosion from burned areas.

Objective #1: Healthy Forest Stand

- Did hand fuels treatments accelerate the development of a desired future stand condition?
- Did salvage logging accelerate the development of a desired future stand condition?



Forest Inventory Plots

- 27 plots established on CTC properties under a variety of conditions
  - –Jeffery Pine and Lodgepole Pine-dominated
  - –Unburned, lightly, moderately and severely burned
- 17 plots located on salvage logged parcels
- 10 plots located on hand-treated parcels

Forest Inventory Plots

- Fixed radius plots
  - 1/10-acre circular, randomly established in each combination of conditions
- Data
  - Tree species, height, diameter, live crown ratio.
  - Canopy cover
  - Regeneration tally
  - Damage and defects
  - Growth increment

Success Criteria

- How do we judge whether the treatment was successful?
- Define thresholds:
  - Lower density than pre-fire conditions
  - Species composition
    - High diversity of native species
    - Greater ratio of Jeffery Pine: Fir

Timing

Data Collection

- Plots established before treatment
- Revisited post-treatment and each year for at least a decade

Results

- Years to decades for actual results
- Immediate predictions from models

Objective #2: Reduced Fuel Accumulation

- Did hand fuels treatments reduce fuel accumulation on burned land?
- Did salvage logging reduce fuel accumulation on burned land?

Fuel Transects

- After James K. Brown (USFS)
- Quantifies number of pieces of ground fuel in variety of size classes
- Measures depth of fuel, litter and duff along the transect
- Success criteria:
  - Reduction of fuel loads over control conditions
  - Computer modeled fire behavior

Timing

Data Collection

- Prior to treatment
- Post-treatment and annually for years to decades

Results

- Many years for cumulative results

Objective #3:
Increase Desired Vegetative Ground Cover

Did seeding and mulching promote increased ground cover of native species?

Vegetation Transects

- Several transects randomly placed in each treatment area
- Species and height class recorded for all herbaceous cover that crosses the transect (line-intercept transect)
- Success criteria: greater native vegetative cover than the control (no seeding)

Vegetation Transects (cont.)

- Various conditions surveyed:
  - Seeded only
  - Seeded under mulch
  - Seeded under compost
  - No seed or mulch applied (control)

Timing

Data Collection

- Spring following planting and annually for 2 subsequent years

Results

- 3 years after planting

Invasive Weeds

- Working with the Lake Tahoe Basin Weed Management Group to monitor and treat invasive weeds
  - Dalmation Toadflax and Perennial pepperweed (tall whitetop) have populations in the burned area
  - All properties in the burned area have been surveyed and treated post burn
  - On-going identification, mapping and treatment will be conducted every summer

Objective #4: Re-establish Tree Seedlings

Did planted seedlings survive at an acceptable rate?

Planted Tree Survival Assessment

- Circular Plots (11.4” radius) established in treatment areas
- Treatments include fall, spring, and no planting (control)
- Record for each seedling in plot:
  - Species
  - Vigor class (live, dead, or dying)
  - Cause of mortality if applicable and known

- Success criteria:
  - 85% survival or greater after 3 years

Timing

Data Collection

- Each summer for three years following treatment

Results

- Three years after planting

Objective #5: Minimize Soil Impacts

Did post-fire salvage logging impact soil quality?

Soil Compaction Data

- Recording soil penetrometer measures soil strength
  - Ability of plant roots to penetrate soil
  - Ability of water to infiltrate
- Soil bulk density sampler provides a sample which is used to measure soil moisture as a means of interpreting soil strength
- Study Sites:
  - Salvage logged areas
  - Hand-treated areas (control)
- Success criteria:
  - No significant increase in soil strength

Timing

Data Collection

- Prior to treatment
- Immediately following treatment
- Spring and fall for 2 years

Results

- Throughout data collection period

Objective # 6: Minimize Soil Erosion

Did erosion control measures minimize soil erosion from burned areas?

Silt Fences

- Capture sediment, but allow water to pass through.
- Specifically designed fences capture sediment from a defined swale so that it may be quantified.
- Timing:
  - Data collection: Following each storm event and during spring runoff for two years
  - Results: Three years following treatment

Channel Changes

- The longitudinal profile of the ephemeral channel was surveyed.
- Resurvey after the wet season will show if any down cutting/soil movement has occurred.

Wildlife

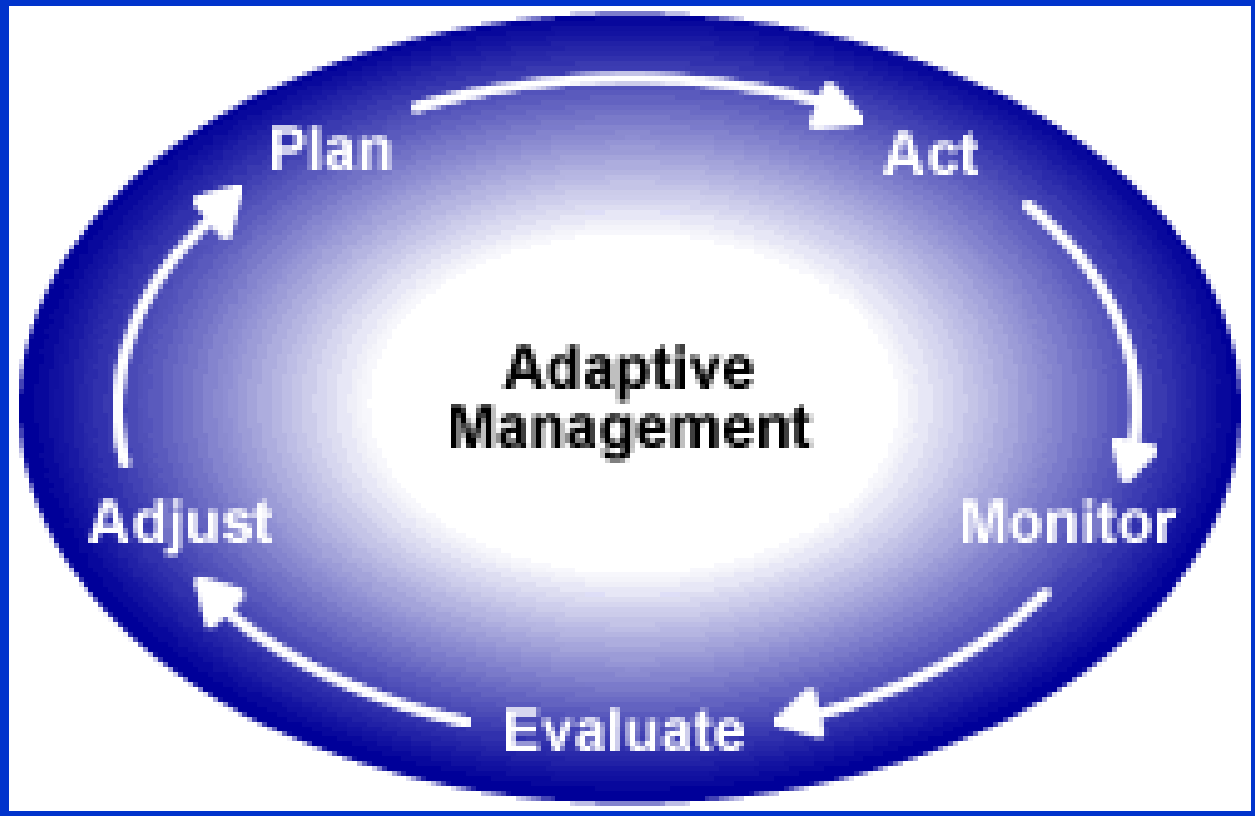
- Working on a protocol to monitor wildlife use in burned area

Pine Marten

Annual Report

- An annual report will detail findings of completed monitoring and provide a report of progress toward a monitoring goals
- Collaboration with other agencies will provide a comprehensive picture of overall fire and restoration effects

Adaptive Management



Future management decisions will be adapted according to findings.

Thank you

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