

# Stewardship Fireshed Assessment

Lake Tahoe Basin Management  
Unit

April 2007

# CORE TEAM MEMBERS

- Scott Parsons  
Silviculturist
- Mark Johnson  
Fire/Fuels Specialist
- John Washington  
Fire/Fuels Specialist
- Ted Thayer  
Wildlife Biologist
- Wes Christensen  
Hydrologist
- Jody Fraser  
Botanist
- Kurt Teuber  
GIS Specialist
- Brian Garrett  
Urban Lot Specialist
- Daniel Cressy  
Landscape Architect

# CORE TEAM MEMBERS Continued

- Dan Young Assistant Vegetation Staff Officer (Team Leader)

## EXPANDED TEAM MEMBERS

- Irene Davidson NEPA
- Bob Becker Recreation
- Billy Ellis Roads
- Gary Weigel Lands
- David Fournier Vegetation Planner

# Objectives

- Protect communities and natural resources
- Collaboratively develop a 10-year schedule
- Strategically placed treatments across the landscape
- Develop a spatially explicit program of work
- Maintain consistency with USFS Region 5 direction

# Resources at Risk



# Current Forest/ Fuels Conditions



# Current Management Direction From LTBMU Land and Resource Management Plan

- Reduce the spread & intensity of fire in the WUI
- Restore key ecosystem components
- Reduce stand density and improve forest health
- Protect/enhance sensitive species & their habitats
- Restore ecosystems following catastrophic events
- Support existing treatments

# Stewardship Fireshed Assessment Process

- An integrated approach to planning
- Firesheds are large landscapes
  - fire regime
  - condition class
  - fire history
  - fire hazard/risk
  - potential wildland fire behavior.
- Fireshed assessment is an interdisciplinary and collaborative process

# Steps in the Fireshed Assessment Process

- STEP 1. Determine wildfire threats by identifying “problem” fire(s) across the forest.



- STEP 2: Frame the analysis area (fireshed) for assessment.

# Steps in the Fireshed Assessment Process Continued

- STEP 3: Characterize the likely behavior of the “problem” fire(s) within the selected analysis area (or fireshed).
- STEP 4: Develop a treatment pattern and prescriptions aimed at changing the outcome of the “problem” fire.

# Steps in the Fireshed Assessment Process Continued

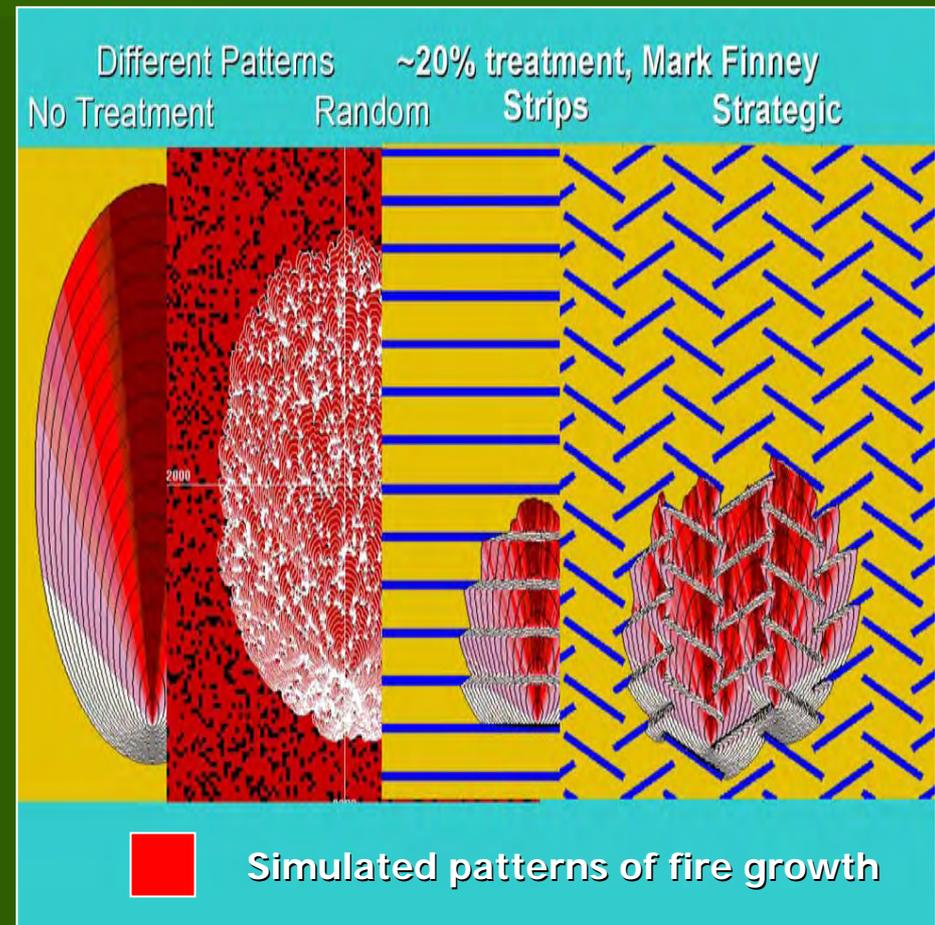
- STEP 5: Adjust treatments to incorporate landscape-scale desired outcomes for other resources where possible while still meeting the intended effect of changing the outcome of the “problem” fire.

# General Strategies

- Reduce fire threat by changing landscape level fire behavior and improve ability to suppress and contain wildland fires.
- Manage forest vegetation structure and composition to improve sustainability.

# Reduce Fire Threat

- Fireshed assessment begins with a conceptual pattern of strategically placed treatments called SPLATS
- SPLATS act as fire behavior “speedbumps”



# Manage Forest Vegetation

- Forest structures that more closely mimic historic density levels
- Landscape-level vegetation structure based on Fire Regime Condition Class
- Species composition, guided by Terrestrial Ecological Unit Inventory

# Treatment Objectives

## ■ Fuels

- Reduce surface and ladder fuels

## ■ Forest Health

- Reduce stand densities

## ■ Resource Protection

- Communities, water quality, scenic, wildlife

# Fuels Treatment Objectives

- Ladder Fuels



- Surface Fuels

# Forest Health



Improve health and vigor  
by decreasing competition  
between trees

Increase resistance to  
insects and diseases



# Water Quality and Scenic Treatment Objectives



- Water quality



- Scenic integrity

# Location Objectives

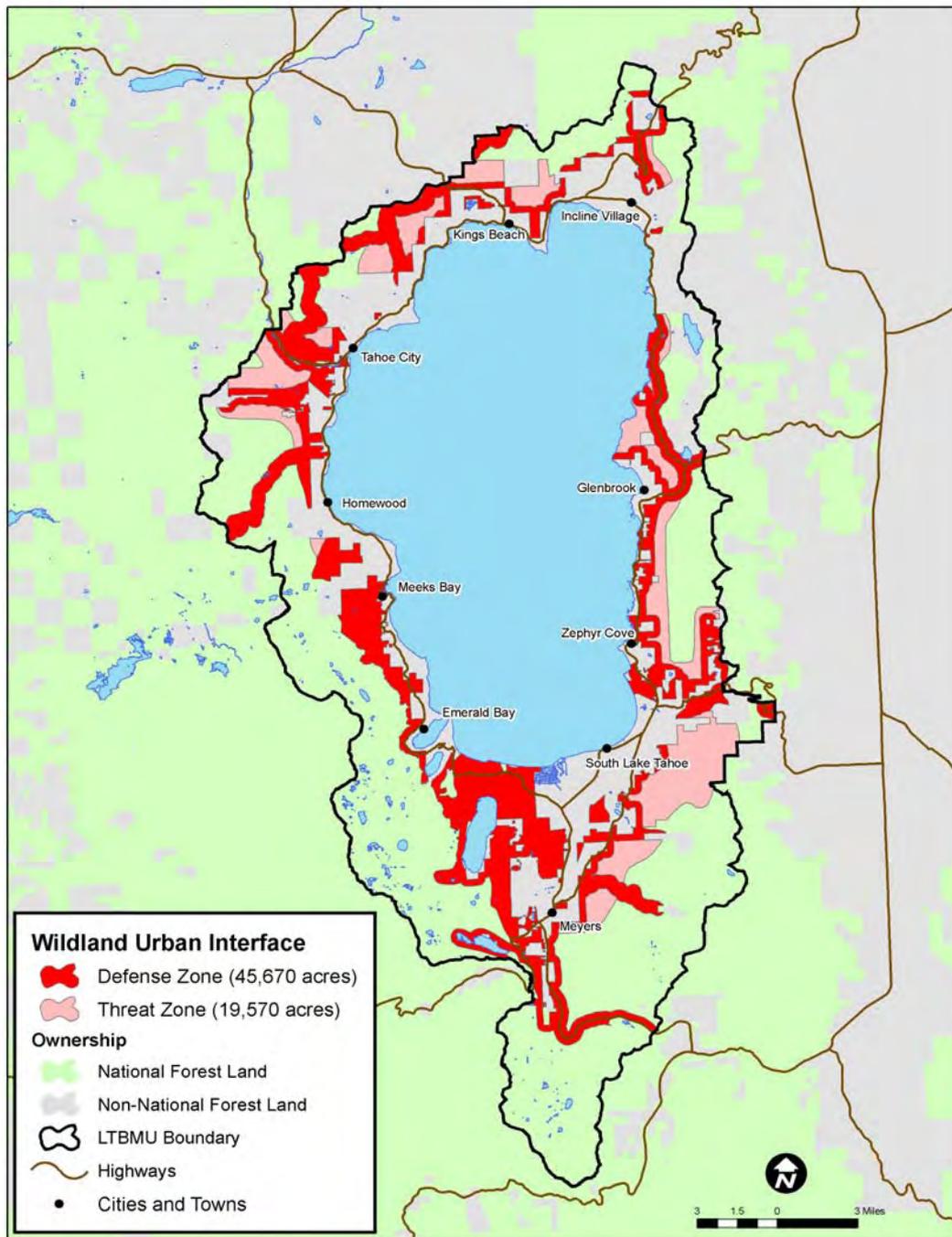


# Tahoe Basin Strategies

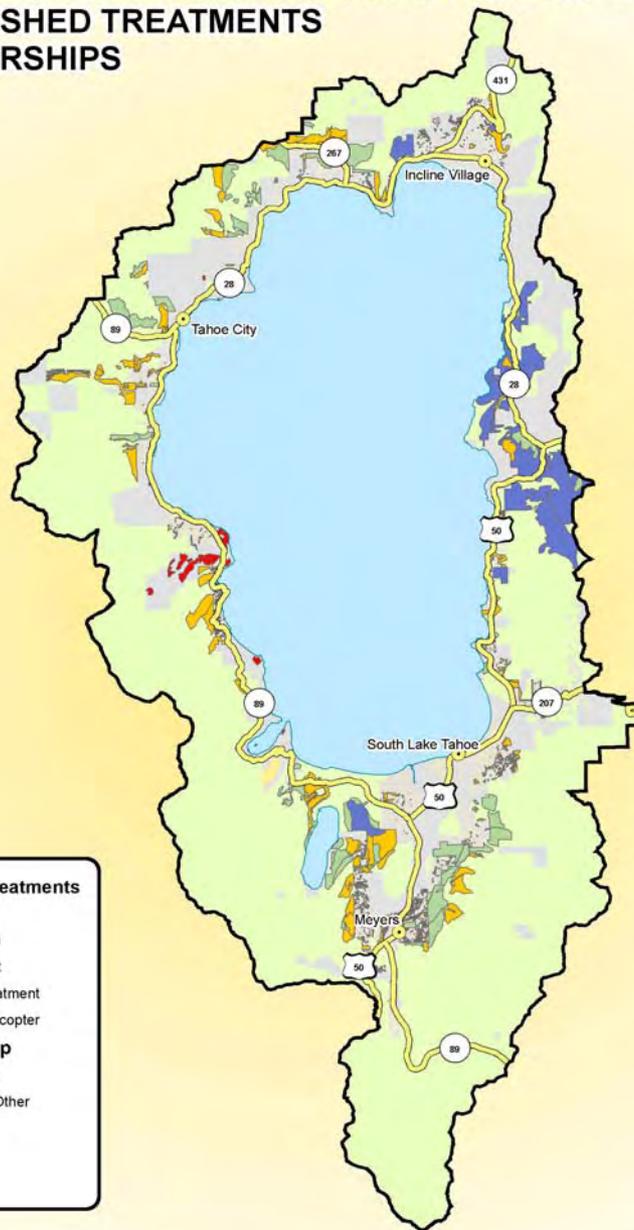


# Tahoe Basin Strategies

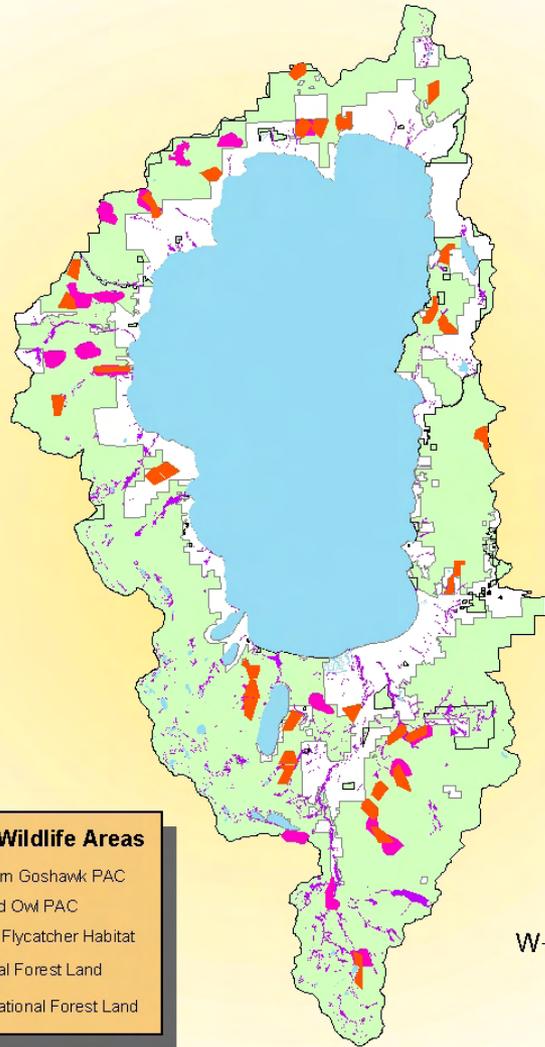
- Treatments within the WUI
- Protection of special status wildlife and plants
- Water quality and watershed protection
- Improve forest health
- Maintain scenic qualities



**LTBMU STEWARDSHIP AND FIRESHED ASSESSMENT  
ACCOMPLISHED TREATMENTS  
ALL OWNERSHIPS  
1995-2006**

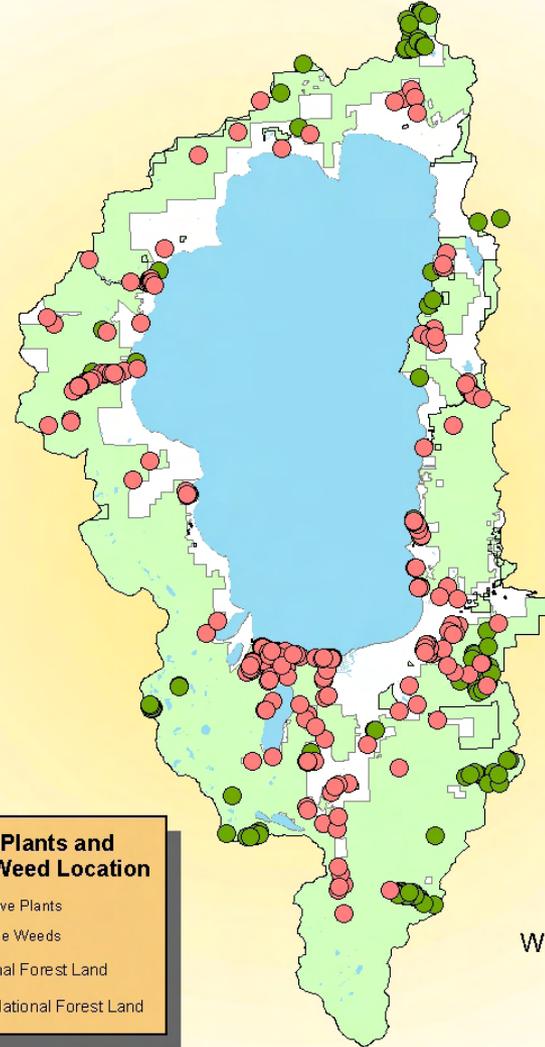


# Sensitive Wildlife and Plants



## Sensitive Wildlife Areas

- Northern Goshawk PAC
- Spotted Owl PAC
- Willow Flycatcher Habitat
- National Forest Land
- Non-National Forest Land



## Sensitive Plants and Invasive Weed Location

- Sensitive Plants
- Invasive Weeds
- National Forest Land
- Non-National Forest Land

# Watershed Protection



# Forest Health

- Fallen Leaf Lake 1873



- Fallen Leaf Lake  
1992  
(119 yrs. Later)



# Forest Health

*Tahoe's "natural" forest - 1880's*



*Today's Tahoe forest*



# Scenic Qualities - Resources at Risk



*Valued forest scenery attributes present*

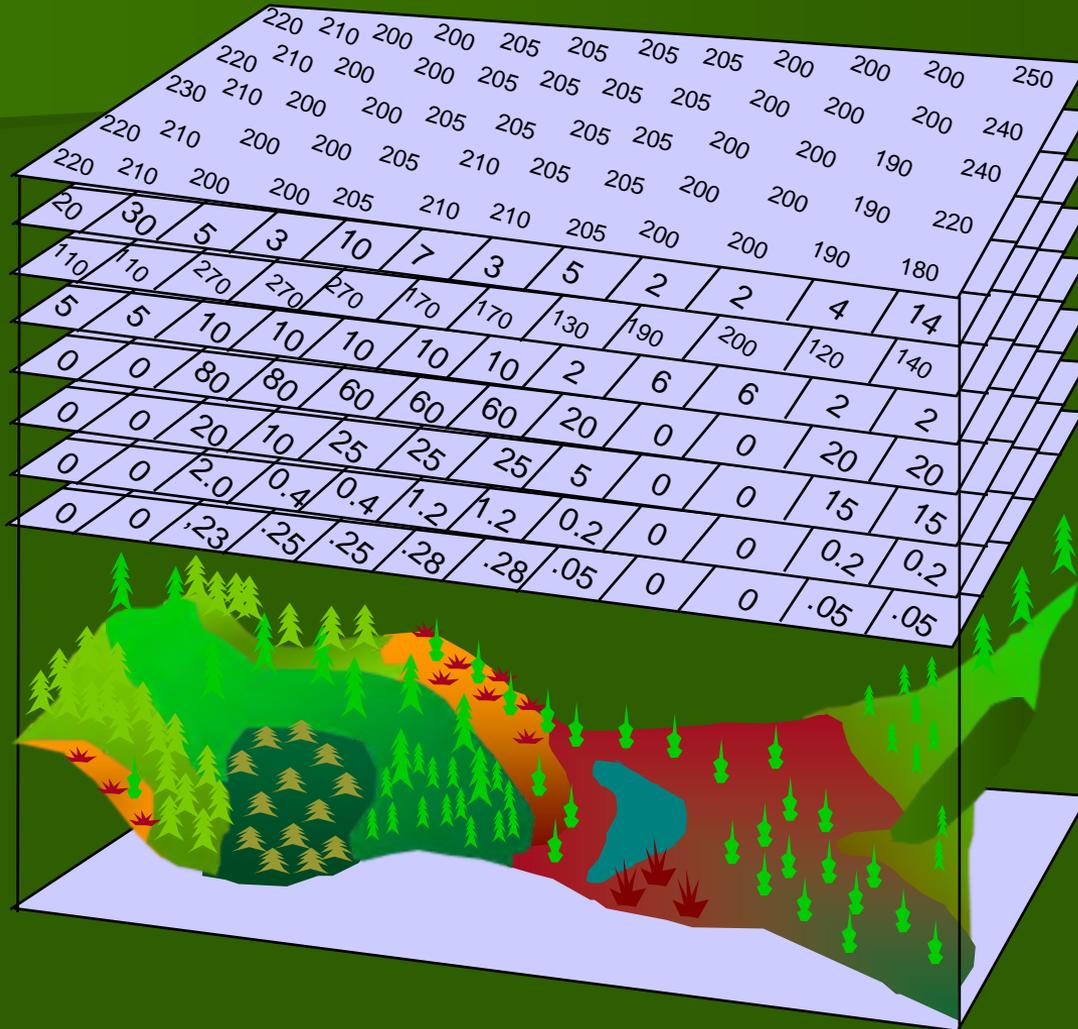


*Valued forest scenery attributes not present*

# Criteria for Locating SPLATS

- High fuel concentrations
- Dense canopy stands
- Past & current treatments
- Extensive treatments in proximity to WUI
- Strategic areas for landscape pattern outside of WUI
- Knowledge of the ground
  - Treatment feasibility

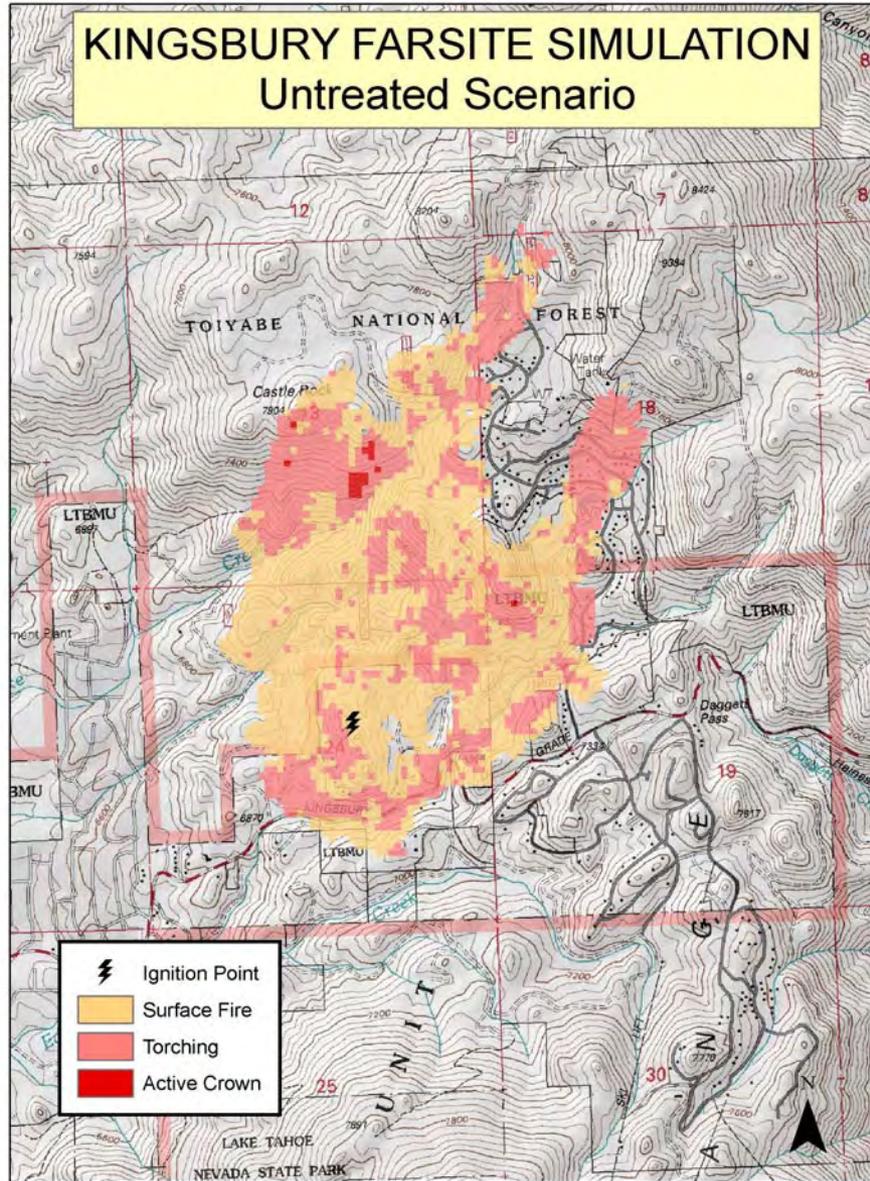
# Flammmap/ Farsite Model Inputs



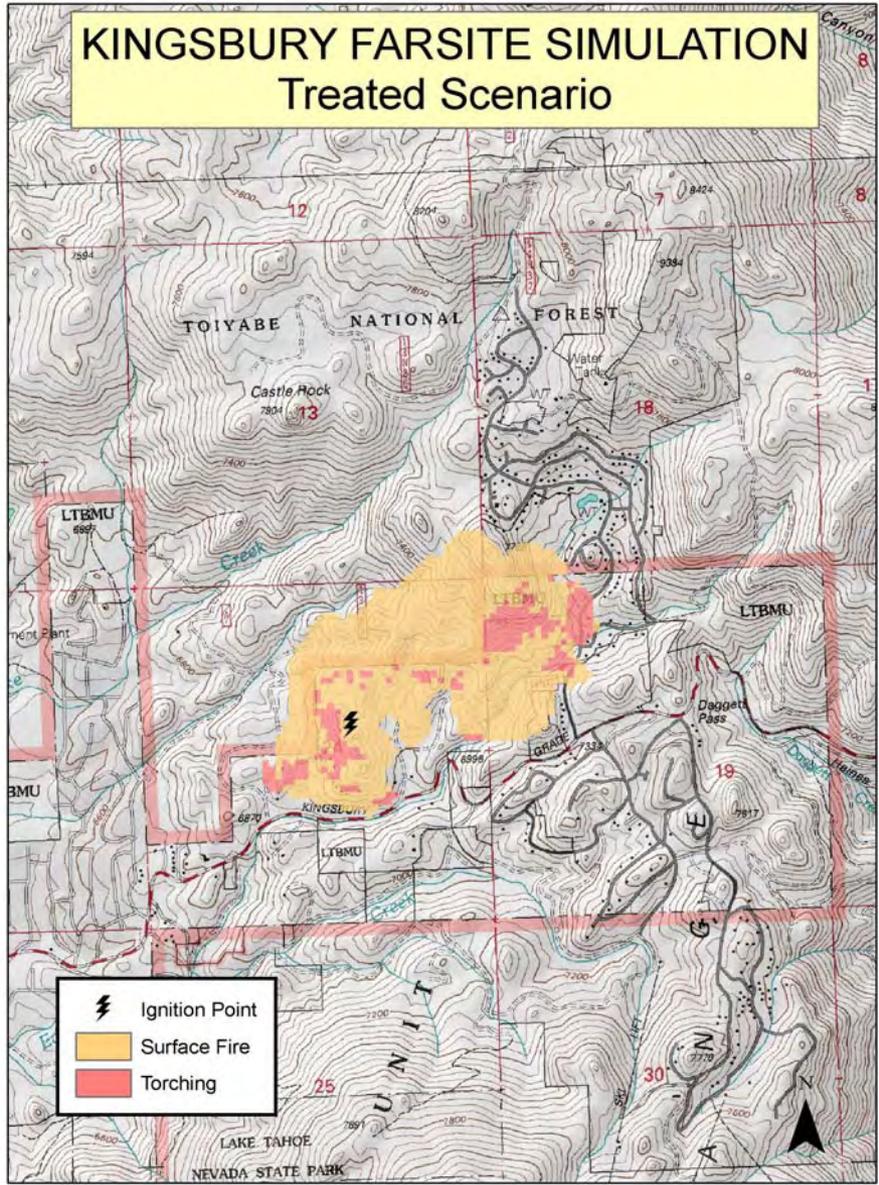
- Elevation
- Slope
- Aspect
- Canopy Cover
- Crown Bulk Density
- Crown Base Height
- Fuel Model
- Tree height
- Duff Loading
- Coarse Woody Debris
- Treatment Prescriptions

# KINGSBURY FARSITE SIMULATION

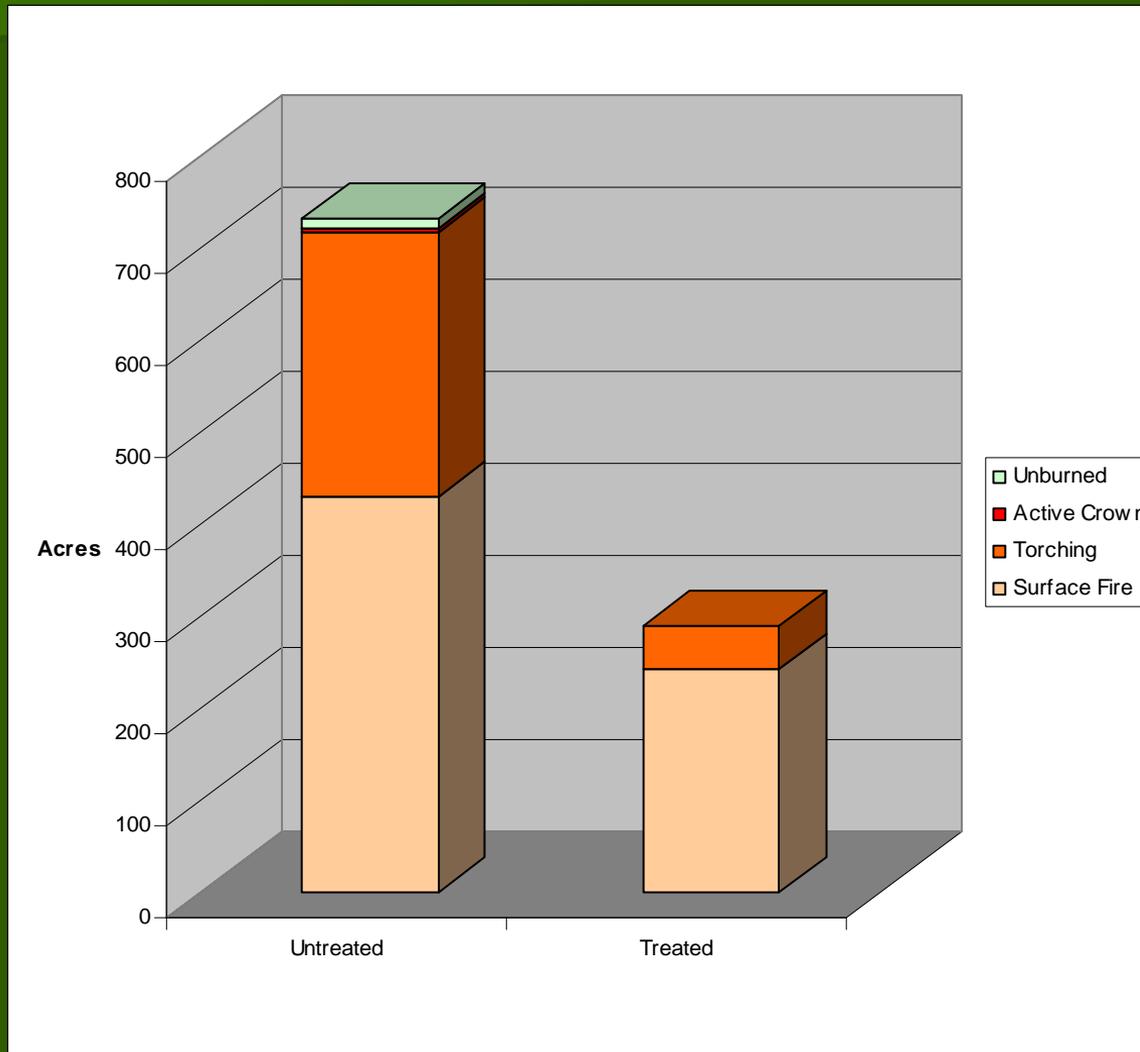
## Untreated Scenario



# KINGSBURY FARSITE SIMULATION Treated Scenario

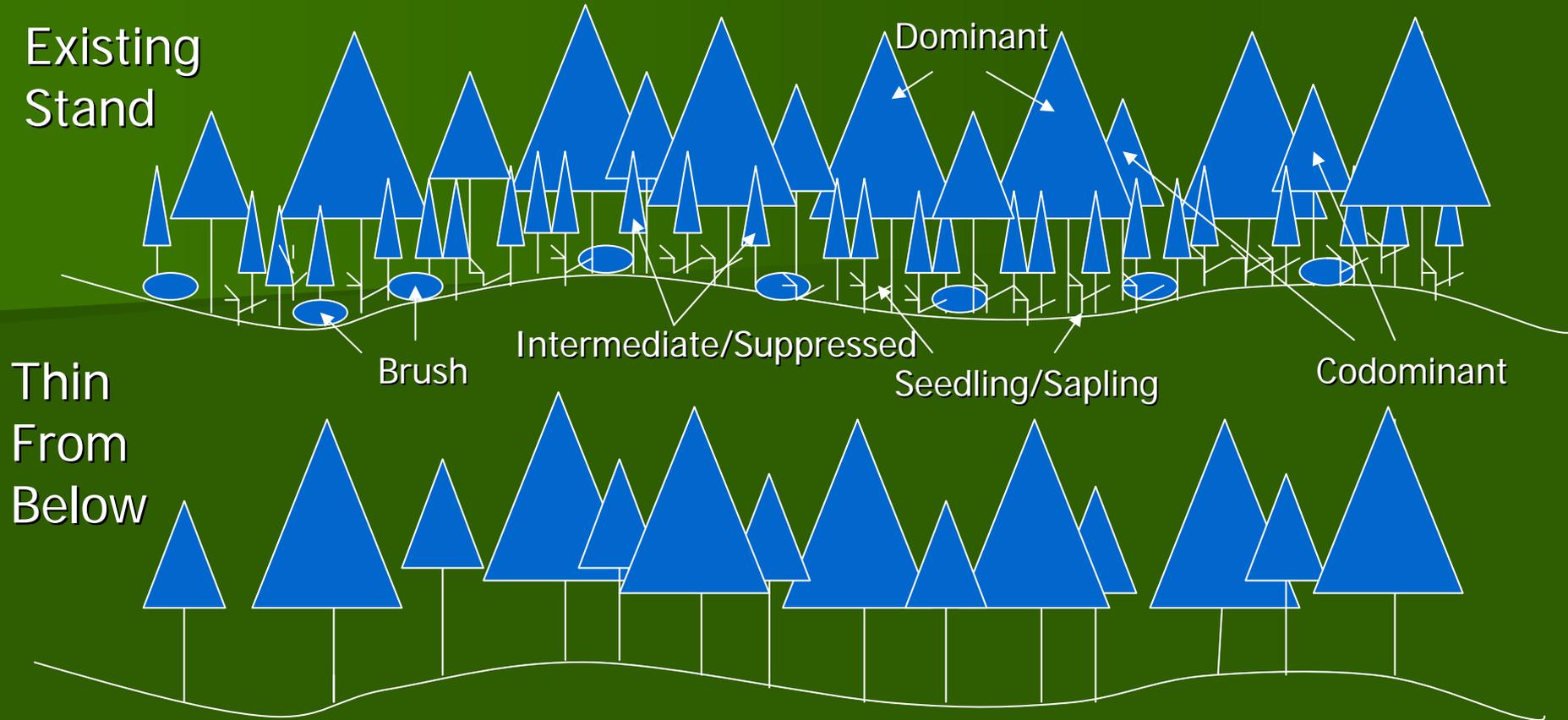


# Treatment Acre Differences Kingsbury Scenarios



# Prescriptions

- **Based on area to be treated**
  - Defense zones
  - Threat zones/SPLATS
  - PACs
- **Based on operations used for treatment**
  - Ground-based mechanical thinning
  - Hand thinning
  - Prescribed fire
- **Based on considerations for other resources**
  - Water quality (CWE)
  - Visuals
  - Wildlife/fisheries
  - Sensitive plants/ weeds



## Prescription Modeling Assumptions

Same prescriptions as modeled in 2004 Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement analysis

Actual prescriptions will depend on site-specific conditions

# Prescriptions Forest Plan

## S&Gs

Outside Defense Zone, within California spotted owl Home Range Core Areas (HRCAs), where canopy cover is 50% or greater:

Retain at least 50% canopy cover

Exceptions:

- Adequately reduce ladder fuels,
- Provide sufficient spacing for equipment operations, and /or
- Minimize re-entry

Then at least 40% canopy cover must be retained

# Prescriptions

## Forest Plan S&Gs

Outside Defense Zone, outside California spotted owl HRCAs, where canopy cover is 50% or greater:

Retain at least 50% canopy cover

Exceptions:

- Adequately reduce ladder fuels,
- Provide sufficient spacing for equipment operations,
- Minimize re-entry,
- Design cost-efficient treatments, and/or
- Significantly reduce stand density

Then at least 40% canopy cover must be retained

# Silviculture Prescriptions LTBMU

## Treatment Constraints

## Mechanical

## Hand

## Letgrow

Slope

0 – 30%

31 – 60%

>60%

Sensitive  
Soils

0 – 15%

16 – 60%

>60%

# Silviculture Prescriptions

## Hand Thinning

### LTBMU

- Prescription 31 was used to model hand thinning.
- This is a basic small tree thinning fuel treatment that is a proxy for surface and ladder fuel removal only and is used when canopy reduction is to be minimized but still have an effective fuel treatment
- Future treatment would be an underburn or mechanical treatment (biomass removal of thinning where possible or helicopter removal).

# Silviculture Prescriptions

## Mechanical Thinning

### LTBMU

- Prescription 41 was used to model mechanical thinning.
- Universal mechanical thinning prescription with 50% canopy closure.
- Additional trees may be removed by thinning proportionally stems greater than 9.9 inches dbh until one of the following constraints is reached:
  - 30-inch DBH maximum size tree removal limit
  - 50 sq. ft. of basal area or one half of existing basal area, whichever is larger

# Landscape Visual Simulations - background

Visual Simulations provide a tool to model and communicate potential changes to landscape character



*Before Treatment Simulation*



*After Treatment Simulation*

# Landscape Visual Simulations - foreground

Visual Simulations provide a tool to model and communicate potential changes to landscape character



*Before Treatment Simulation*

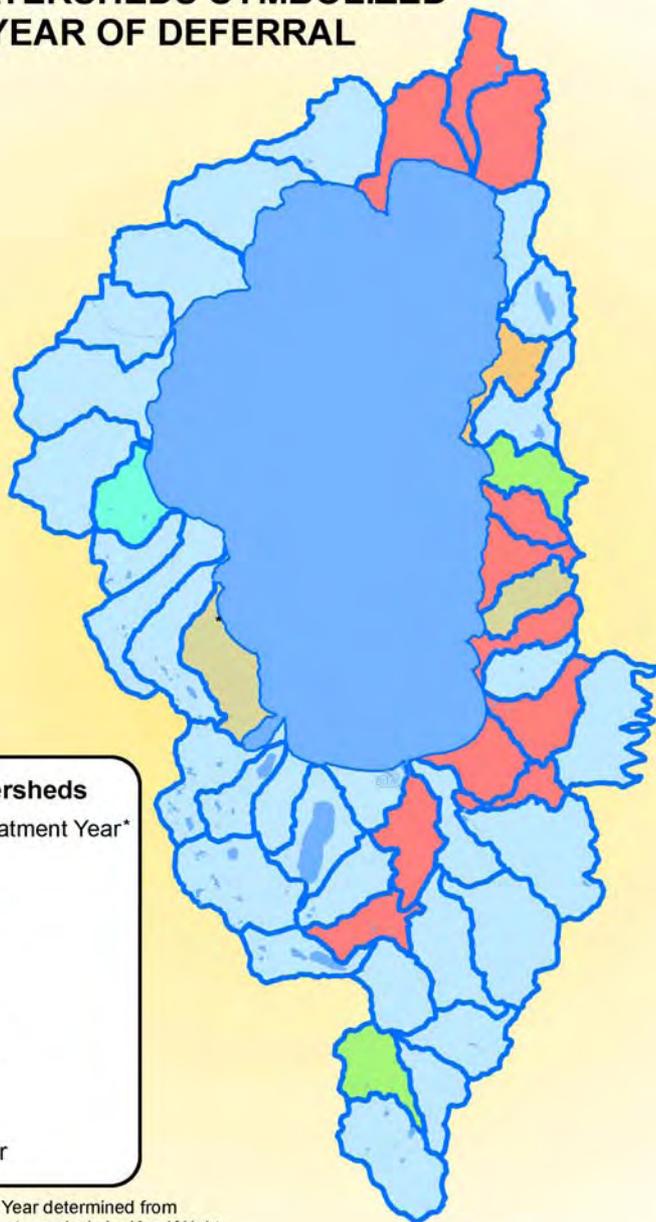


*After Treatment Simulation*

## HUC7 WATERSHEDS SYMBOLIZED BY YEAR OF DEFERRAL



\*Minimum Treatment Year determined from  
Cumulative Watershed Effects analysis by Ken Wright  
June 2005.



# WEPP: Sediment Model Output

No Wildfire			
	Annual Average Sediment (tons/acre)	Sediment from 4-yr Storm (tons/acre)	Probability of 1st Year Sediment Delivery
No Treatment	0	0	10%
Treatment	0	0	10%
Wildfire			
	Annual Average Sediment (tons/acre)	Sediment from 4-yr Storm (tons/acre)	Probability of 1st Year Sediment Delivery
No Treatment	20.41	29.61	100%
Treatment	0.01	0.01	45%

Documentation, validation procedures, etc related to the WEPP model can be found:

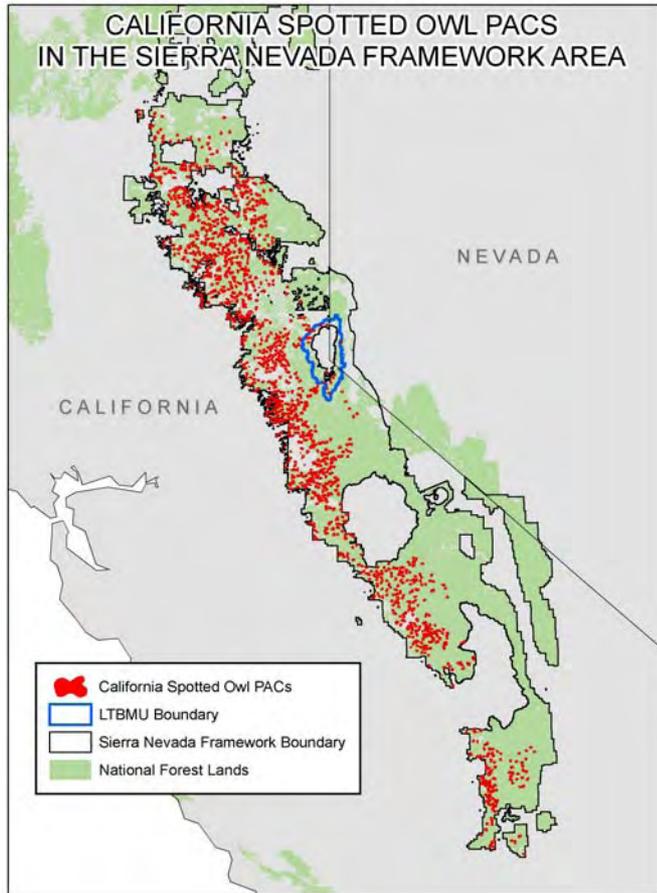
<http://topsoil.nserl.purdue.edu/nserlweb/weppmain/wepp.html>

# Protected Activity Centers: Area Treated

Acres of PAC's planned to be treated over ten years and percentage of Basin total by species.

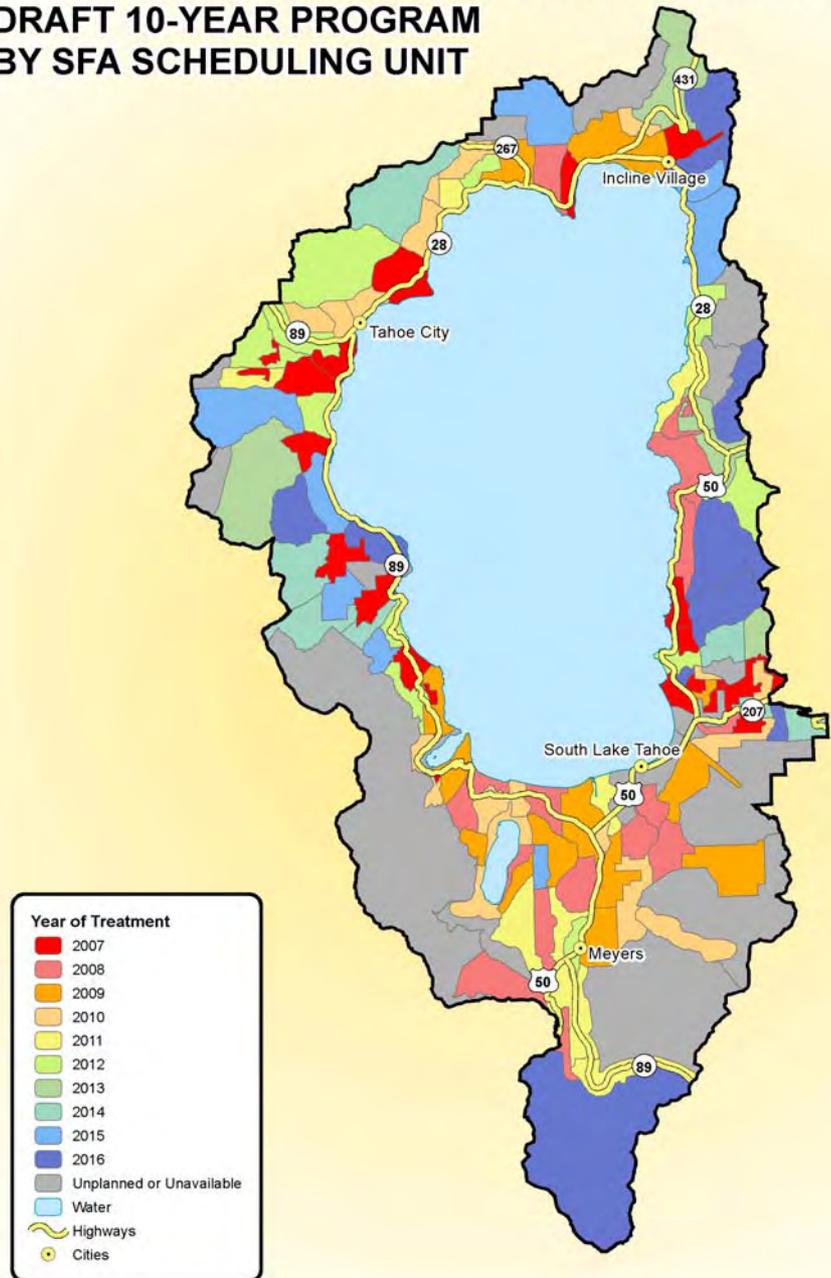
Species	Acres Treated	Percent of Total Acres
Northern Goshawk	3245	43.6
Spotted Owl	2316	36.8

# Protected Activity Centers: Bioregional Context

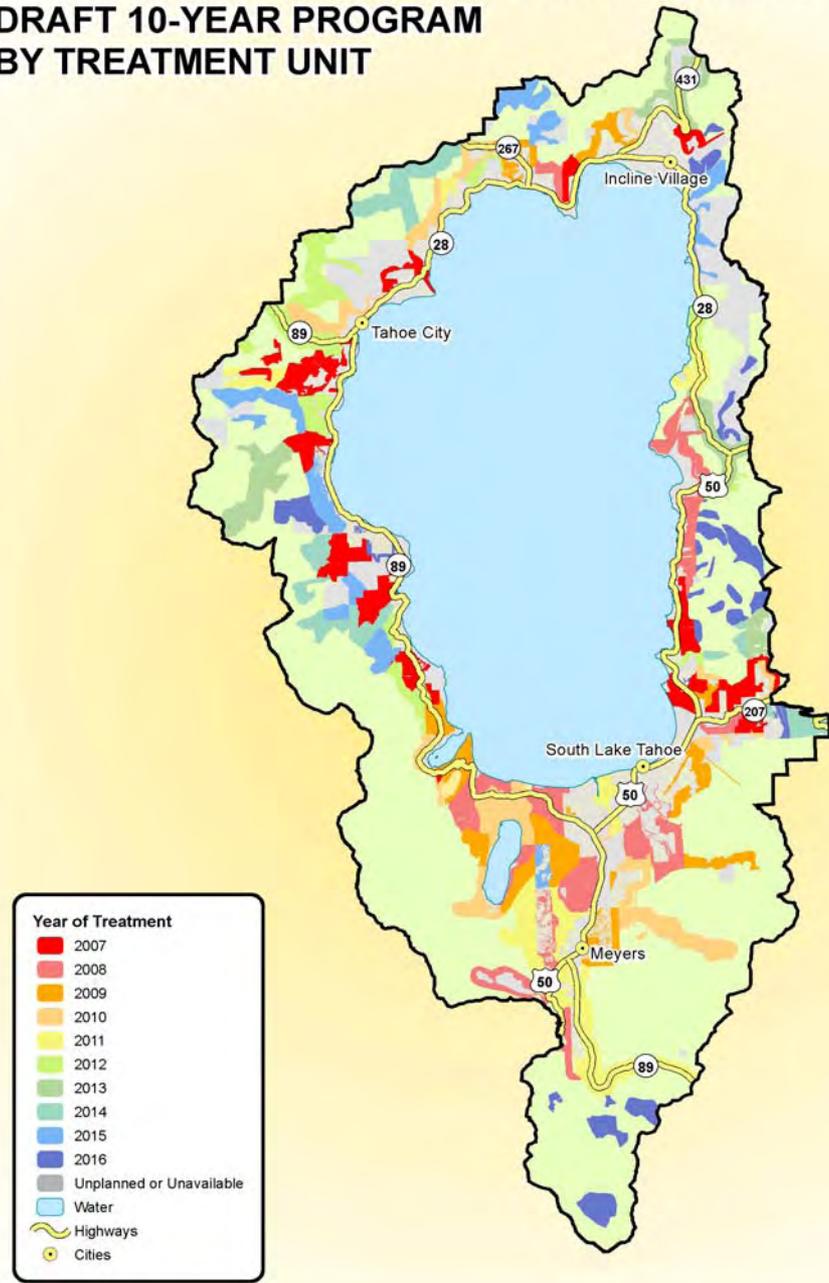


- Total spotted owl PAC acres within 11 Sierra Nevada Forests:
  - **421,780**
- Proposed LTBMU acres:
  - **2316**
- Percent of bioregional acres proposed for treatment on LTBMU over next 10 years:
  - **0.55%**
- Percent of total acres treated across all 11 forests from 2001 to 2005:
  - **1.86%**
- SNFPA 2004 Standard and Guide 80 allows:
  - maximum of 5% (21,089 acres) treated per year
  - 10% (42,178 acres) treated per decade

# LTBMU STEWARDSHIP AND FIRESHED ASSESSMENT DRAFT 10-YEAR PROGRAM BY SFA SCHEDULING UNIT



# LTBMU STEWARDSHIP AND FIRESHED ASSESSMENT DRAFT 10-YEAR PROGRAM BY TREATMENT UNIT



# Notes on SFA Process

- The modeled outputs are our best estimates at the forest-wide scale.
- Models have limitations, and their predictions are estimates.
- As we conduct project level NEPA analysis and implement on-the-ground projects our estimates will change because they'll be more precise.

# Next Steps

- Present to public during Spring 2007
- Finalize a spatially explicit 10-year program of work for the forest
- Continue collaboration
- Implement planned treatments
- Periodically review and update program of work