

**Collaboration of Local,  
Regional, State and  
Federal interests to  
protect the  
Mokelumne River  
Watershed**



Upper Mokelumne River  
Watershed Authority

*A United Front*



# Speakers

## *Rich Farrington*

Director, Amador Water Agency and  
Director, Upper Mokelumne River  
Watershed Authority (UMRWA)

## *Michael Pickard*

Area Representative, Sierra Nevada  
Conservancy (SNC)



# Introduction

- Mokelumne River Watershed natural resources are under increasing stresses like elsewhere in the Sierra and Foothills
- A growing '*united front*' of concerned agencies are aligning their energies to mitigate those stresses:
  - **Amador Calaveras Consensus Group (ACCG)**
  - **Sierra Nevada Conservancy (SNC)**
  - **US Forest Service (Stanislaus and Eldorado National Forests)**
  - **Upper Mokelumne River Watershed Authority (UMRWA)**





# Introduction

## UMRWA Snapshot

- UMRWA is a **Joint Powers Authority** formed in 2000 to address improvements in
  - Water quality
  - Water supply
  - Watershed resources
- 8 member Board of Directors
- Supported by part-time Executive Officer, Landmark Environmental, and Member Agency in-kind support

## Member Agencies

- Alpine County
- Alpine County Water Agency
- Amador County
- Amador Water Agency
- Calaveras County
- Calaveras County Water District
- Calaveras Public Utility District
- East Bay MUD
- Jackson Vly. Irr. Dist.





# Sierra Nevada Conservancy Snapshot

- California State Agency created in 2004
- Mission to initiate, encourage, and support efforts that improve the environmental, economic and social well-being of the Sierra Nevada Region, its communities, and the citizens of California.
- 16 Member board
  - 5 Governor appointees
  - 2 Legislative appointments
  - 6 Local government representatives



## Presentation Topics

- Mokelumne Watershed Overview
- ACCG Collaborative Beginning & Actions
- SNC Investment in the Watershed
- UMRWA – USFS Master Stewardship Agreement
- Intricacies of Implementing Actions
- Progress Today and into the Future
- SNC's Watershed Improvement Program





# THE CHALLENGE: PROTECT MOKELUMNE RIVER & WATERSHED







# **BUTTE FIRE, NORTH FORK MOKELUMNE, OCT 2015**



Upper Mokelumne River  
Watershed Authority



**BUTTE  
FIRE  
MUD  
FEB  
2016**





**RUNOFF  
FROM  
BUTTE  
FIRE, FEB  
2016,  
4 MOS.  
AFTER  
FIRE**



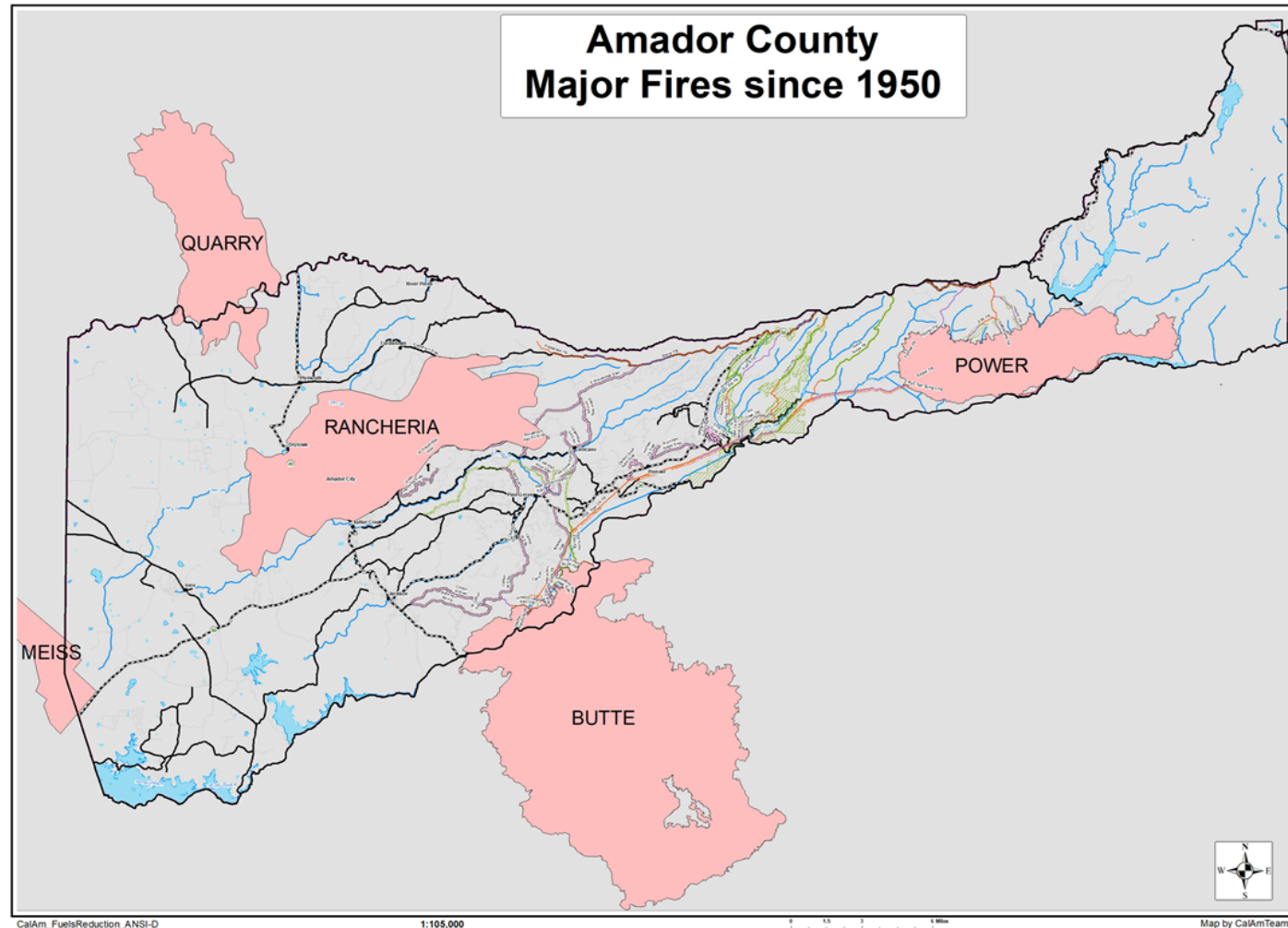
**KING FIRE MUD, APR. 2015, 5 MOS.  
AFTER FIRE IN OCT. 2014**



# 6 - AMADOR CO. FIRES FROM 1950

161,167 ac Total

**BUTTE - 2015**  
70,846 ac  
**SAND - 2014** 4,240  
ac  
**POWER - 2004**  
16,983 ac  
**MEISS - 1981**  
14,125 ac  
**QUARRY - 1976**  
20,869 ac  
**RANCHERIA -**  
1961 34,104 ac





# Increasing Major Fires (444,336 Ac) in Mokelumne Watershed and Adjacent Counties (2008 – 2017)

## Wildfires > 1,000 acres

Name (Year)	County	Acres	Structures	Fatalities
Butte (2015)	Calaveras & Amador	70,868	818	2
King (2014)	El Dorado	97,717	80	0
Sand (2014)	El Dorado/Amador	4,240	67	0
Rim (2013)	Tuolumne	257,314	112	0
Power (2013)	Tuolumne	1,070	0	0
Ramsey (2012)	Calaveras	1,137	0	0
Knight, Wildcat & Harden (2009)	Tuolumne	8,891	0	0
Angora (2008)	Eldorado	3,100	309	0

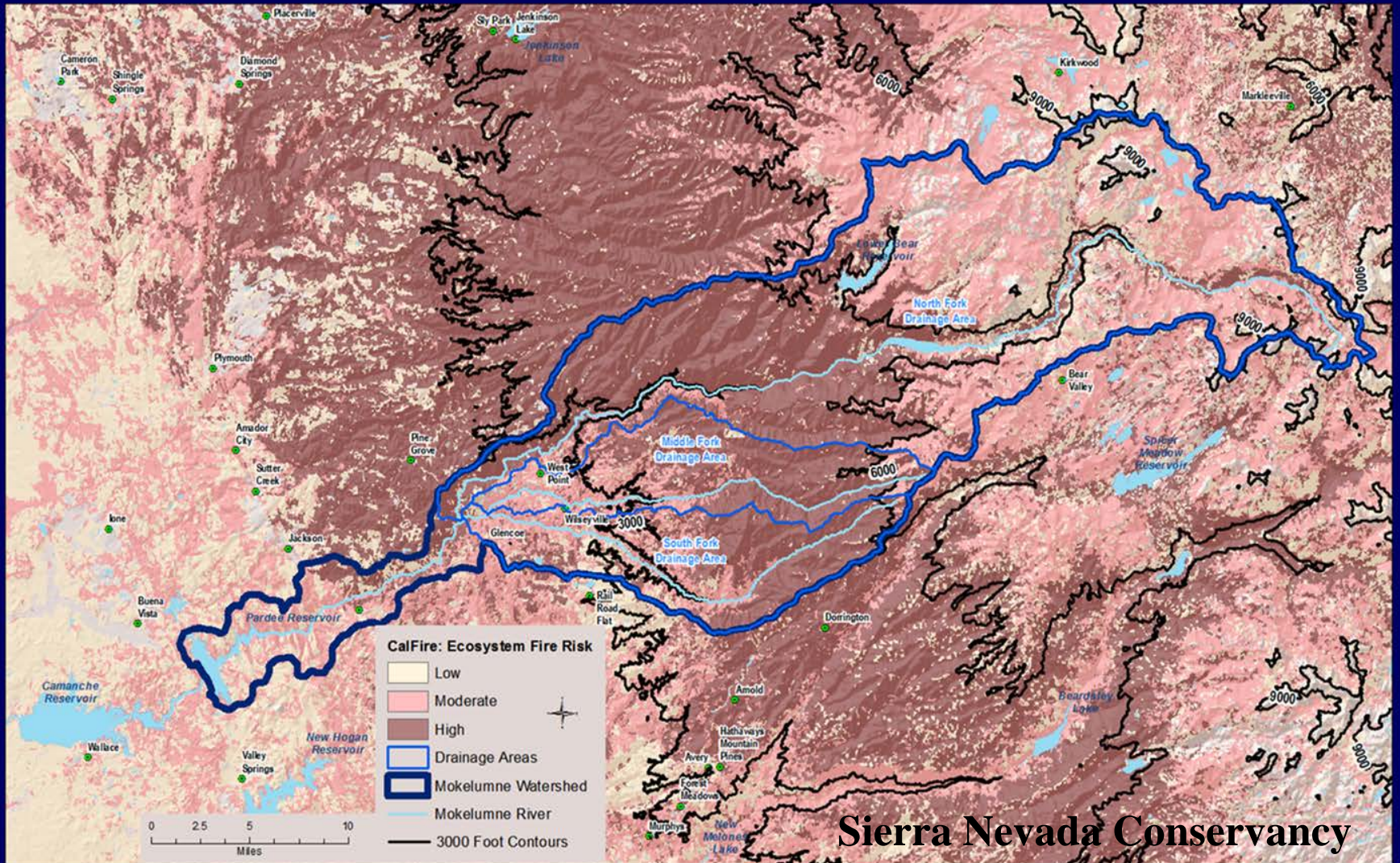
**444,337 Ac**





# MOKELUMNE HIGH FIRE RISK

## Mokelumne Watershed Fire Risk







**Studies Show:**

**Healthy Forests Resist Fire  
&  
Drought**

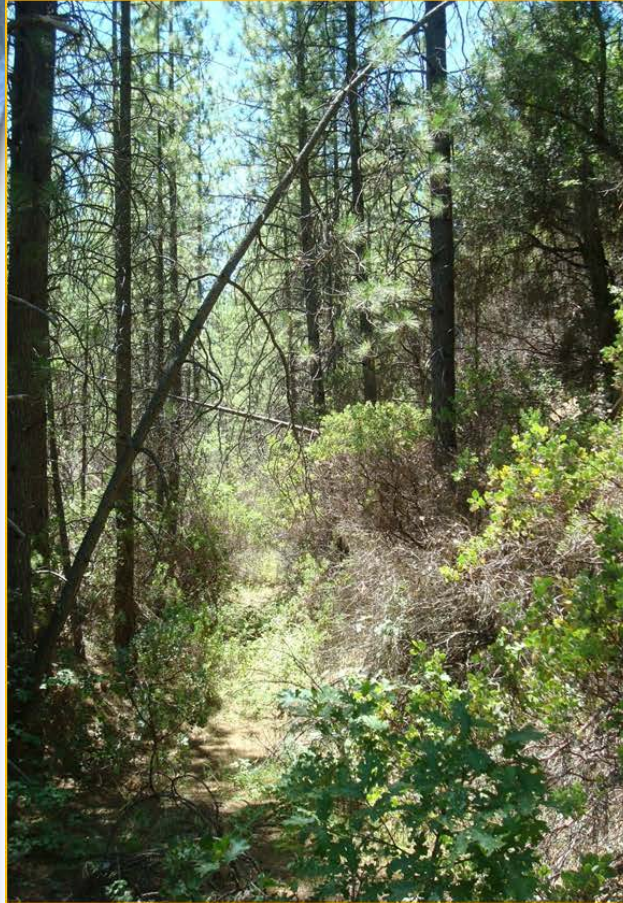




**Unhealthy**

**vs**

**Healthy Forest**





# 1926 Amador County



1926 - Old growth Ponderosa pine stand between Beaver and East Panther Creek in Amador County.



# Mokelumne Watershed Overview

## Watershed Basics:

- Area: 218,880 acres (342 sq. mi.)
- Elevations: Ranges from 696 at Pardee Res. to 10,382 feet at Round Top Mountain
- Total Population: 84,107 [Alpine 1,102, Amador 37,953, and Calaveras 45,052]
- Population Density: 33/square mile [Alpine 2/sq mi, Amador 63/sq mi, Calaveras 39/sq mi]
- Annual Precipitation: Ranges from 21" to 50"
- Overlaps with two National Forests & BLM:
  - Eldorado NF
  - Stanislaus NF







# Mokelumne Watershed Overview

## Mokelumne Water Infrastructure

Amador County (5 Cities pop. served 25,000)

- AWA's Amador Water System
- AWA's Central Amador Water Project
- PG&E's Project 137 – Mokelumne River Hydro

Calaveras County (pop. served 6,000)

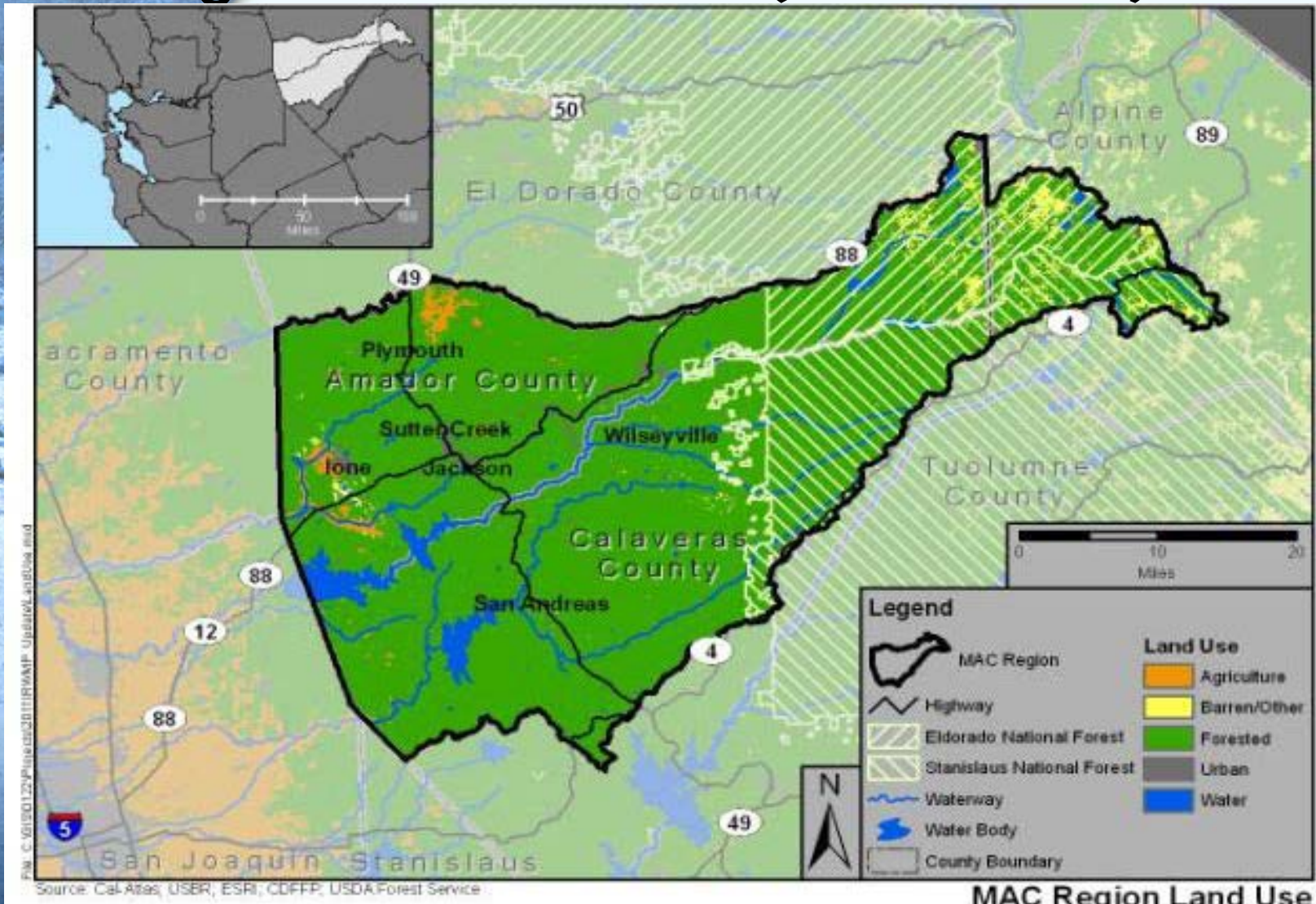
- CPUD's South Fork Mokelumne System
- CCWD's West Point/Wilseyville System

East Bay Municipal Utility District (pop. served 1.4 million)

- Pardee Dam and Reservoir
- Camanche Dam and Reservoir
- Mokelumne Aqueducts



# UMRWA Integrated Regional Water Management Plan Area (MAC IRWM)



MAC Region Land Use



# **PG&E Lower Bear River Res. N. Fk Mokelumne Watershed AMA Co.**





# **PG&E Regulator Res. N. Fk. Mokelumne Watershed, AMA Co.**





# **CPUD Schaads Reservoir Middle Fork Mokelumne Calaveras Co.**



Upper Mokelumne River  
Watershed Authority



# CPUD So. Fork Mokelumne Calaveras County

Pump Station



Diversion







**CPUD  
Jeff Davis  
Reservoir  
Middle  
Fork  
Mokelumne  
Watershed  
Calaveras Co**



# **EBMUD Pardee Reservoir**

## **Water for 1.4 million**





# High Quality Mokelumne River Water







# Mokelumne Watershed Overview

## Declining Health of Mokelumne Forests

- Fire exclusion, overcrowding, and insufficient management =
- Increased susceptibility to drought, insects, pathogens, and **FIRE**
- **Key contributors to Mokelumne Forests' declining health:**
  - Pine and Engraver beetles
  - Diseases, Mistletoes, Fungus
  - Climate Warming/Drought

Result = Increased Conifer Mortality and Risk of Catastrophic Fire [Past 7 years an avg. 4,970 acres have had some level of tree mortality]



# Mokelumne Watershed Overview

## Acres with beetle caused tree mortality (2007 – 2012)

Host Species	Total Acres
Lodgepole Pine	8,487
White Fir	6,319
Mixed Conifer	6,118
Firs	4,434
Pines	3,892
CA Red Fir	3,127
Ponderosa Pine	1,583
Western White Pine	383
Jeffrey Pine	307
Sugar and Whitebark Pine	132
	34,781



# Mokelumne Watershed Overview

## Wildfire Consequences to Watershed & Downstream Users

- Degrades water quality
- Increases water temperature
- Damages soil and increases erosion
- Increases sedimentation
- Degrades fish and aquatic wildlife and habitat
- Reduces reservoir capacity
- Reduces carbon sequestration
- Reduces recreational opportunity
- Increases water runoff and reduces retention

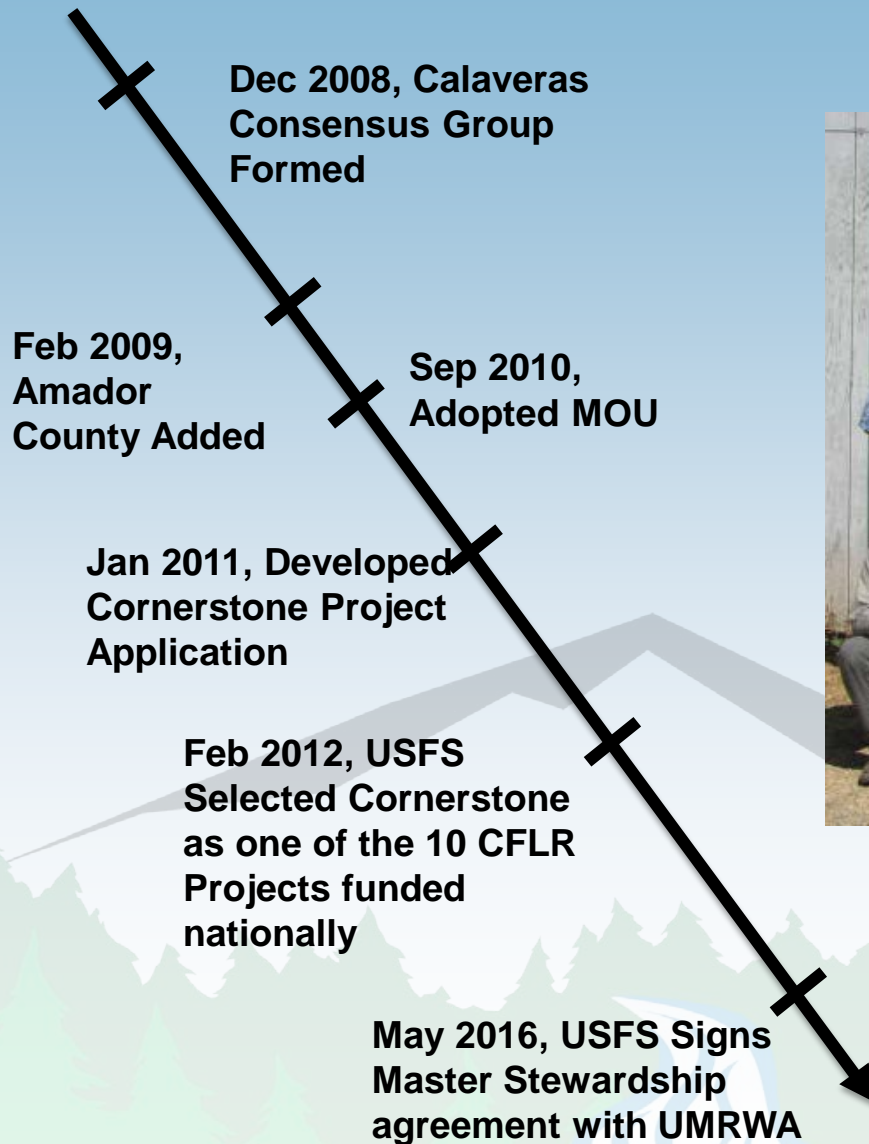




# Amador-Calaveras Consensus Group



# Creation & Actions of the Collaborative



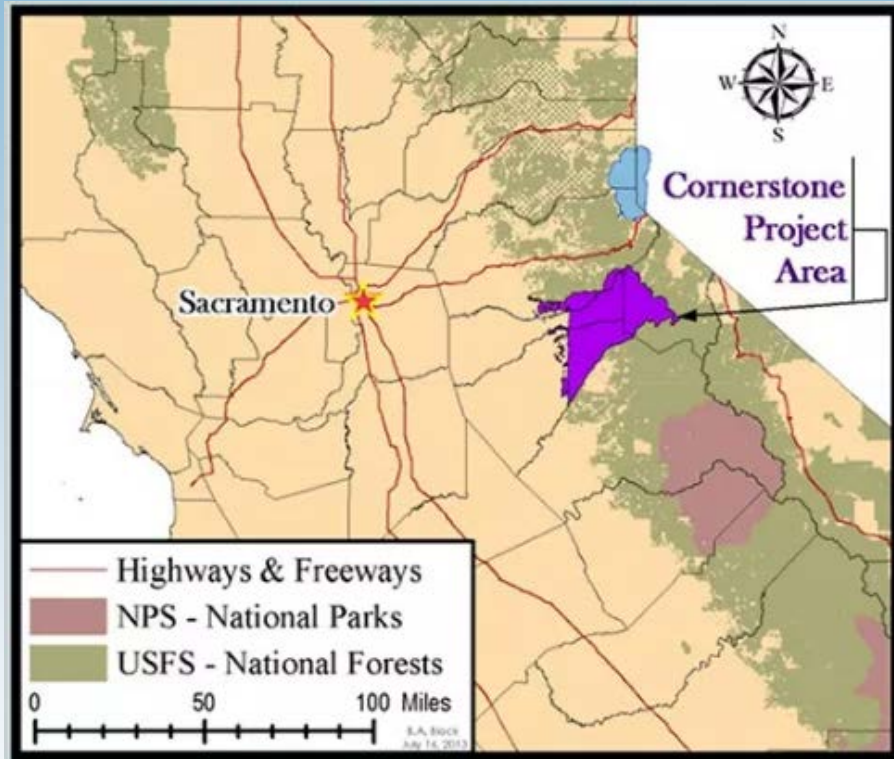
Signing the Memorandum of Understanding, September 2010



# Amador-Calaveras Consensus Group

- A community-based organization that works to create fire-safe communities, healthy forests and watersheds, and sustainable local economies.
- The economies, natural environments, and communities of Amador, Calaveras, and Alpine Counties are healthy and sustainable.
- Representation from Federal, State, and Local agencies, industry professionals, environmental organizations, private businesses, non-profits, and private citizens.

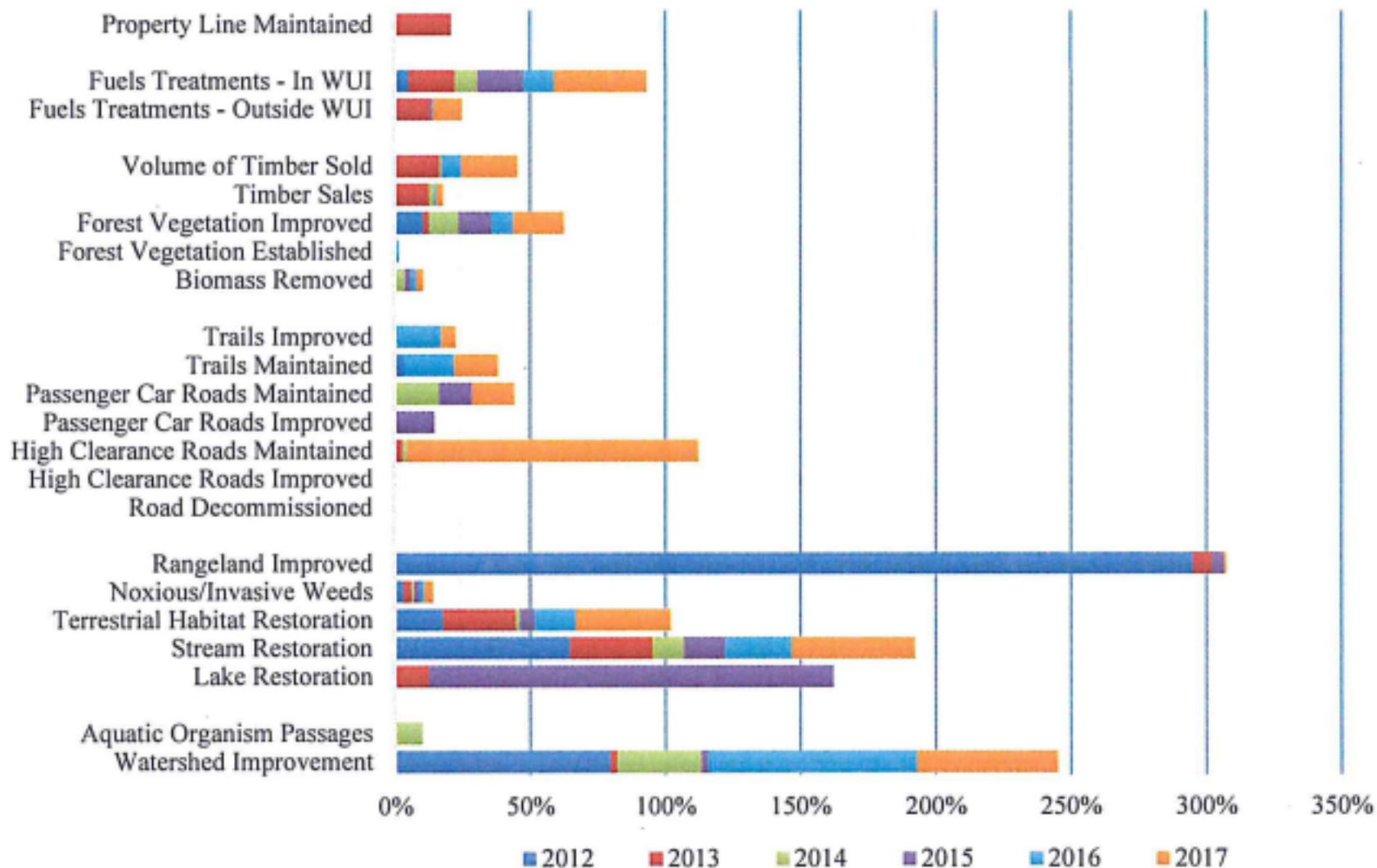
# USFS Collaborative Forest Landscape Restoration (CFLR) Program



- Omnibus Public Land Management Act of 2009
- Cornerstone CFLR Project applied for in 2011, and funded in 2012.
- 391,000 Acres in Upper Mokelumne Watershed
- 10 years of funding (2012 – 2021)
- Hemlock Landscape Restoration
  - 14,000 Acres
  - NEPA Completed in 2015



## Progress Towards Meeting Targets Described in the Cornerstone Proposal



# Early SNC Investment into the Watershed

Does Forest Restoration make economic sense?

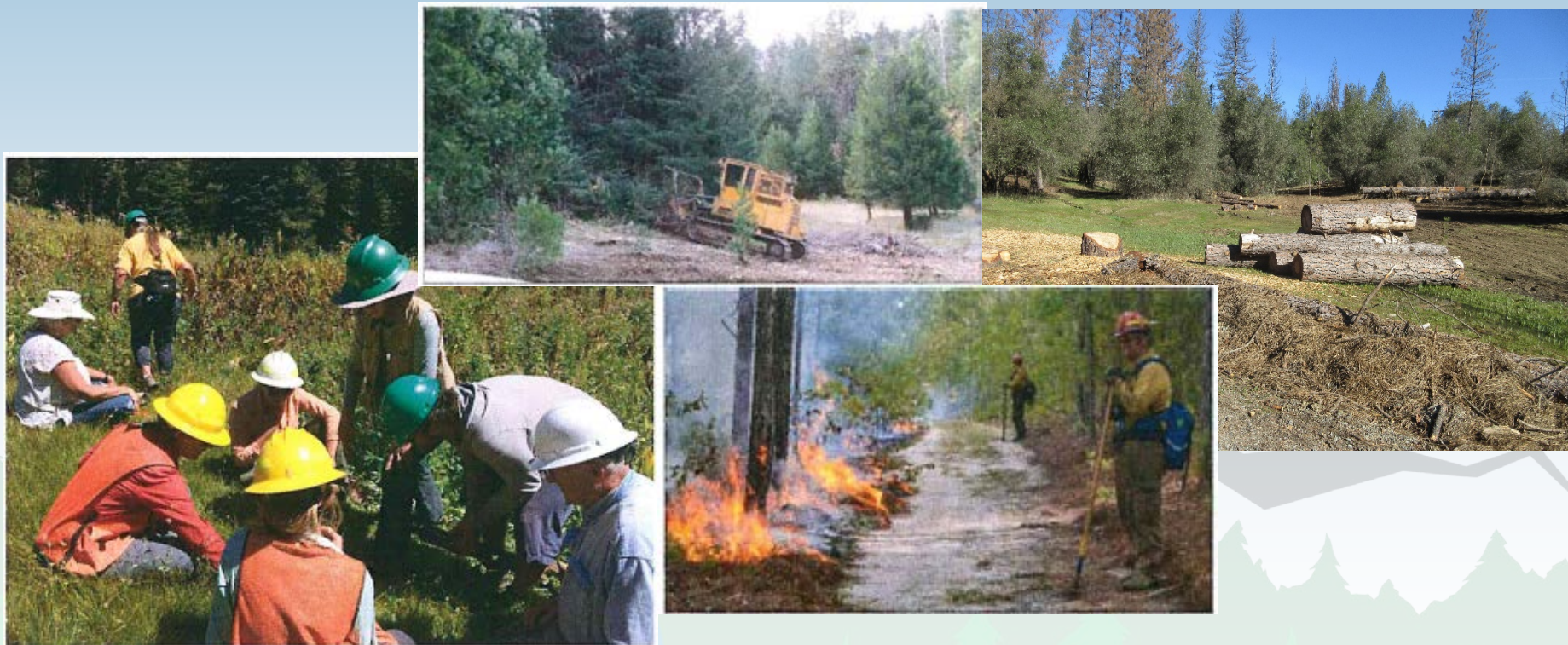
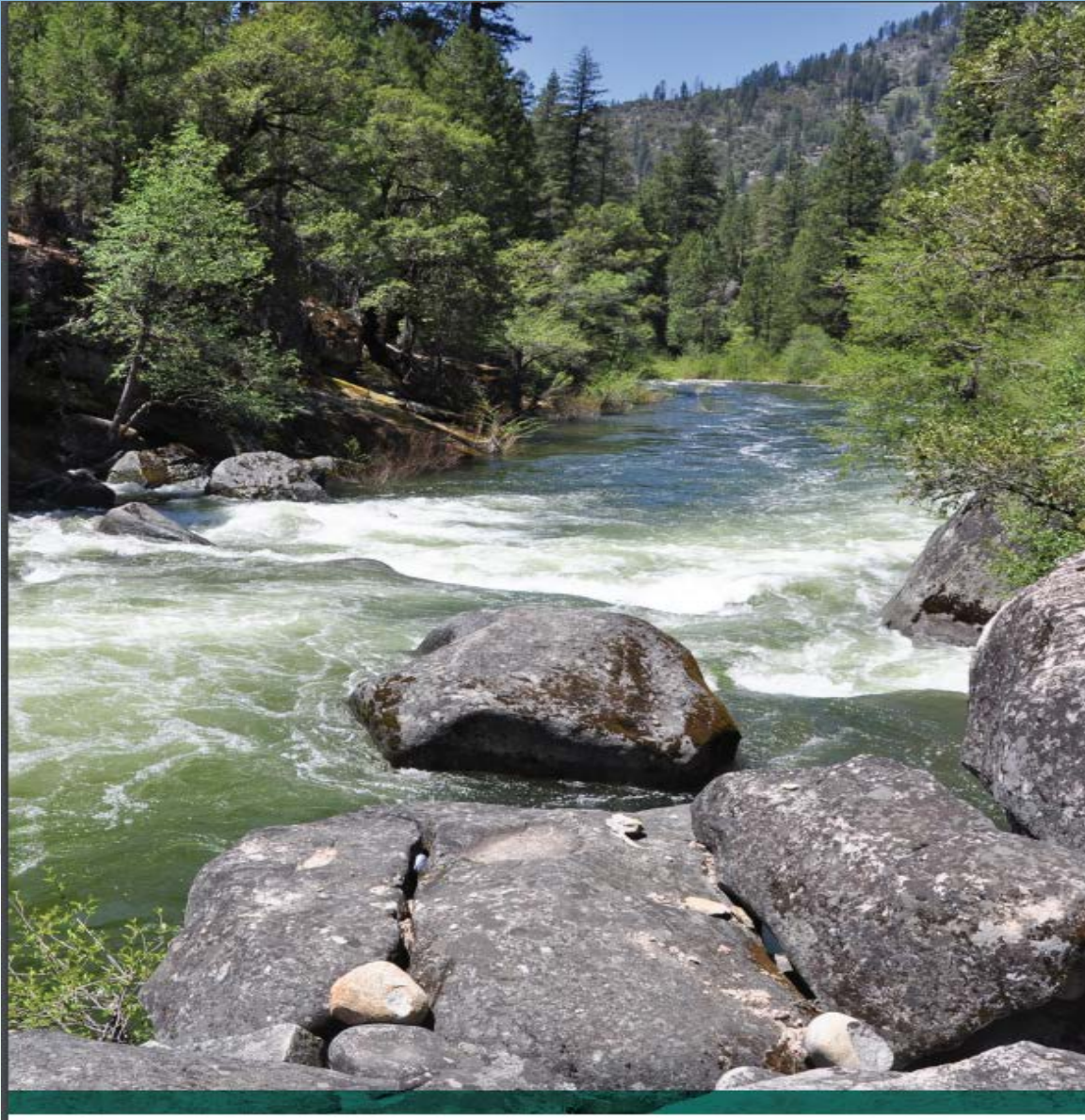


Photo credit: Pat McGreevy, USFS, M. Pickard



# SNC Mokelumne Avoided Cost Analysis





# Partners

## Planning Team:

- US Forest Service Region 5
- The Nature Conservancy
- Sierra Nevada Conservancy



## Advisory and Technical Teams:

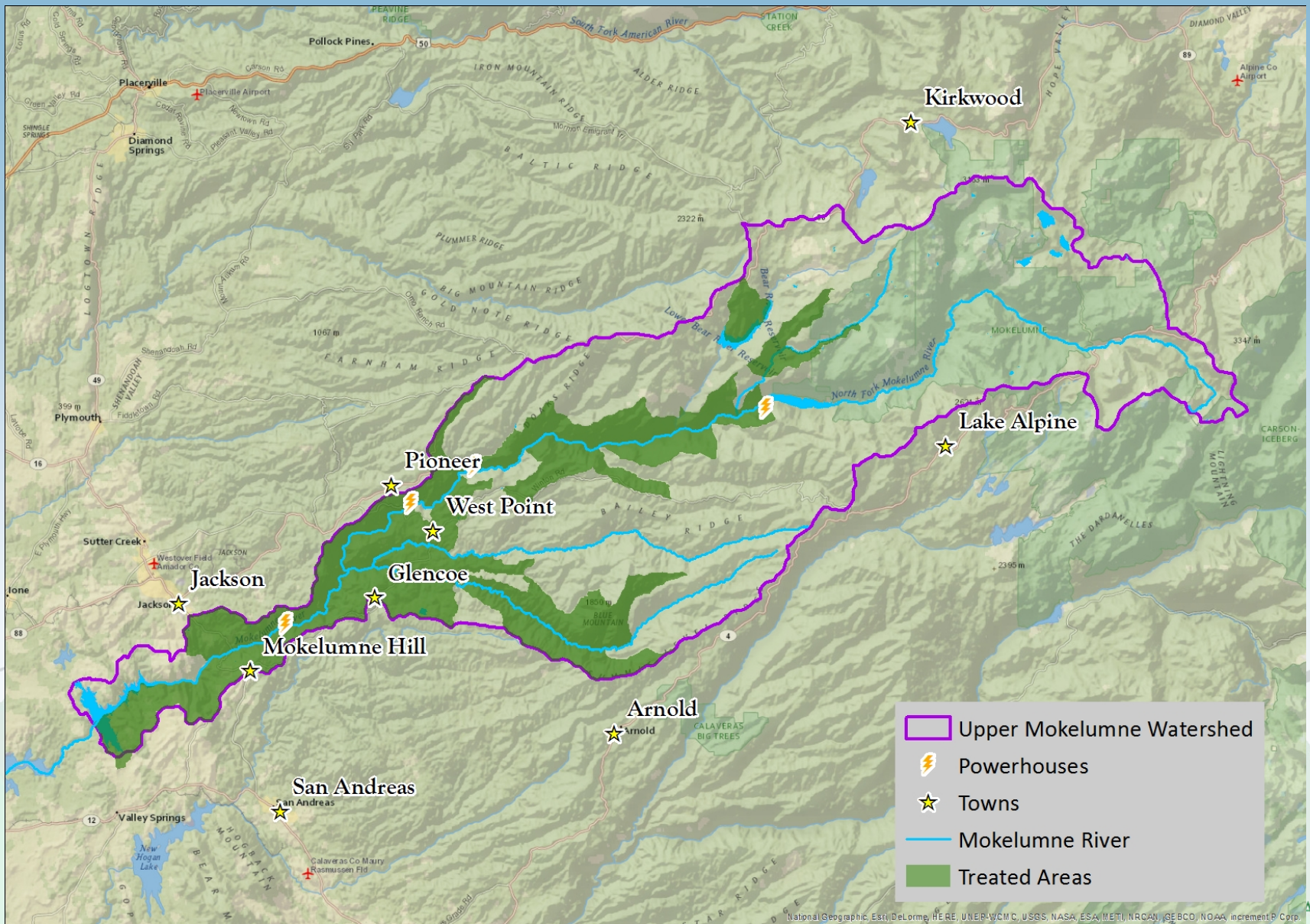
- East Bay Municipal Utility District
- Pacific Gas & Electric
- Eldorado National Forest
- Stanislaus National Forest
- Bureau of Land Management
- Sierra Pacific Industries
- Environmental Defense Fund
- Native American Community
- Foothill Conservancy
- Sustainable Conservation
- Department of Water Resources
- CALFIRE
- Local Fire Districts
- Amador & Calaveras Counties



# Primary Goals of the Project

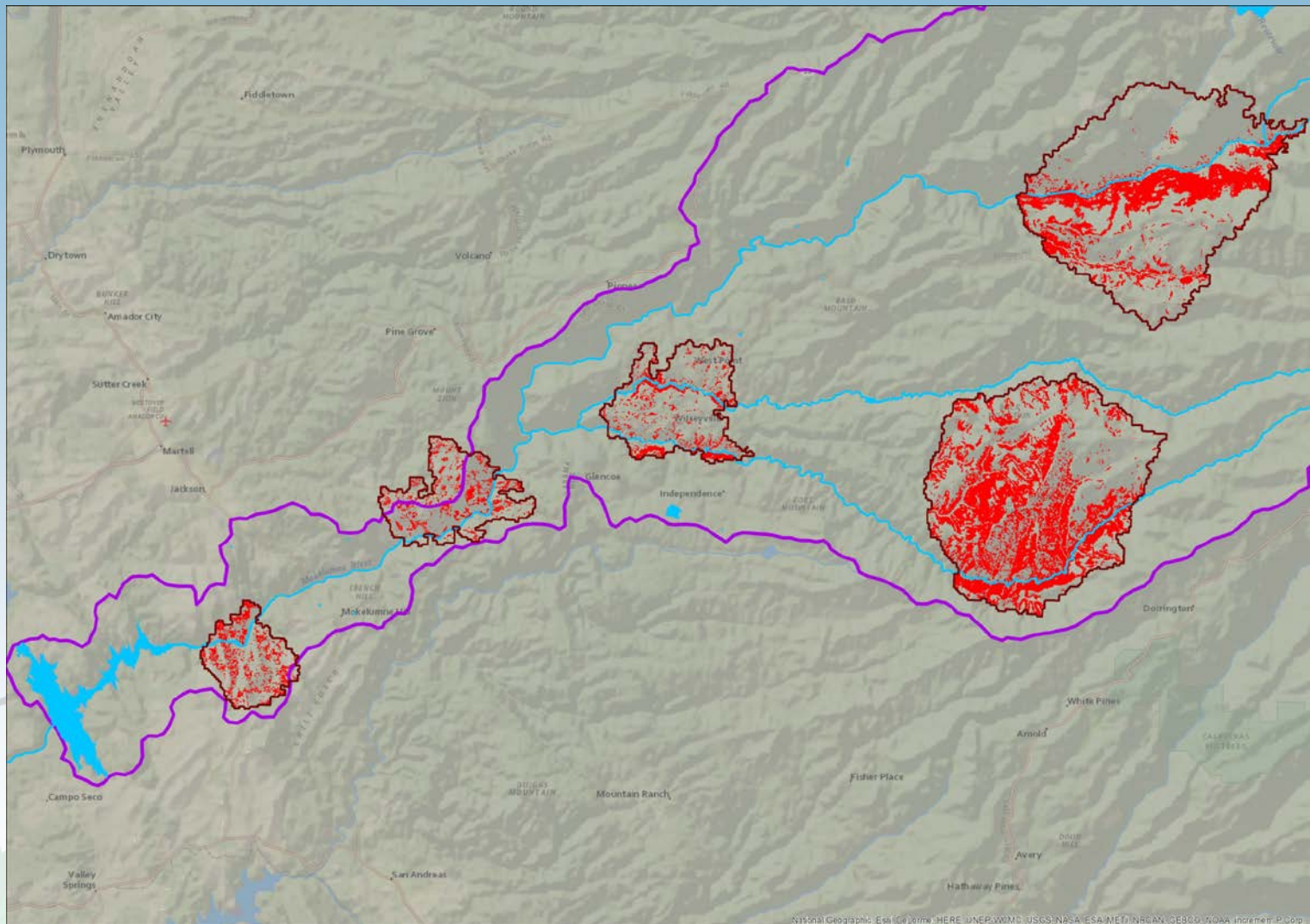
- Calculate the avoided costs of implementing forest treatments versus current conditions.
- Identify treatments and locations that maximize net benefits.
- Increase pace and scale of forest treatments through new investment sources.
- Use modeling to forecast future events.

# Treatment Scenario

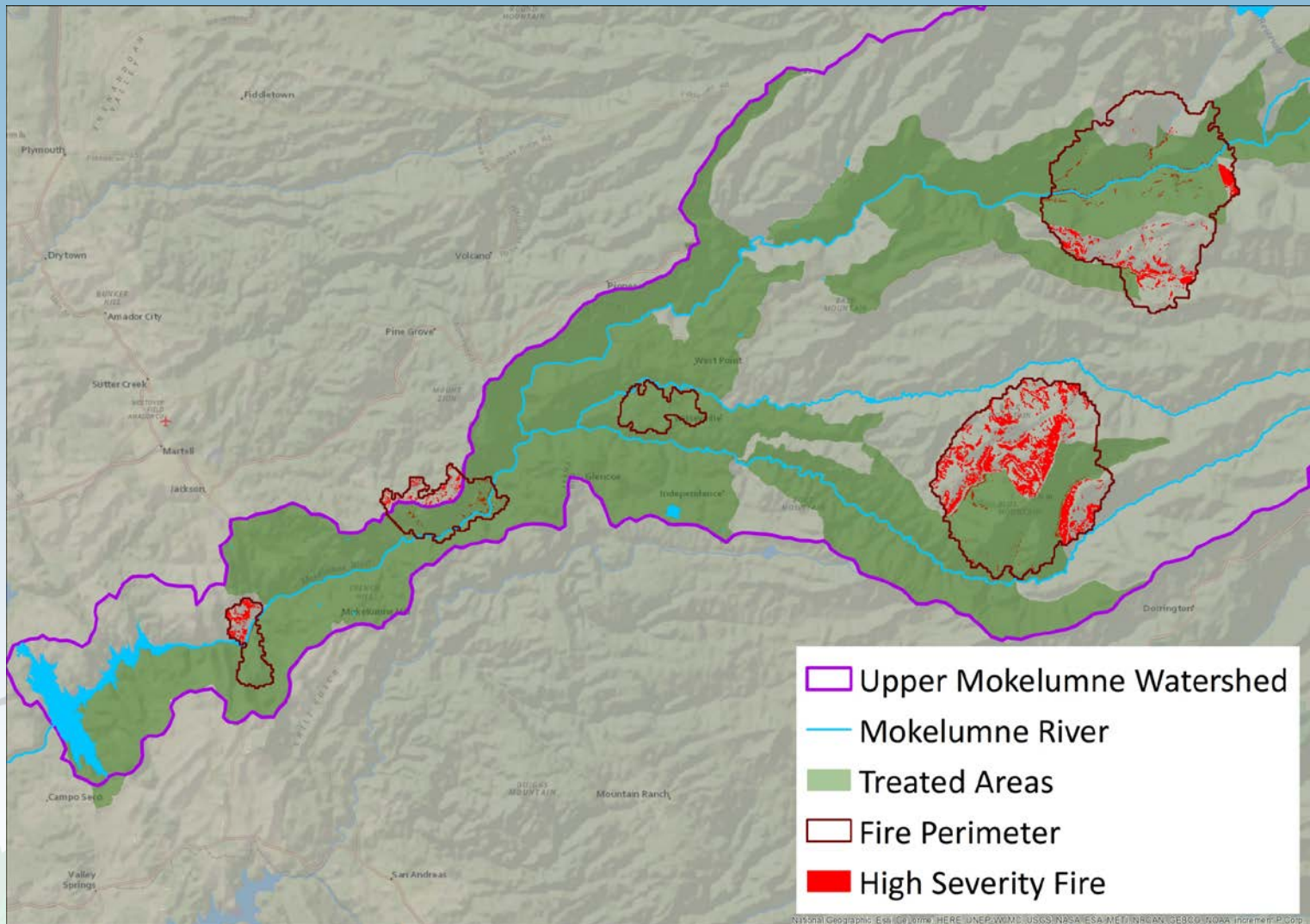




# Pretreatment Fires

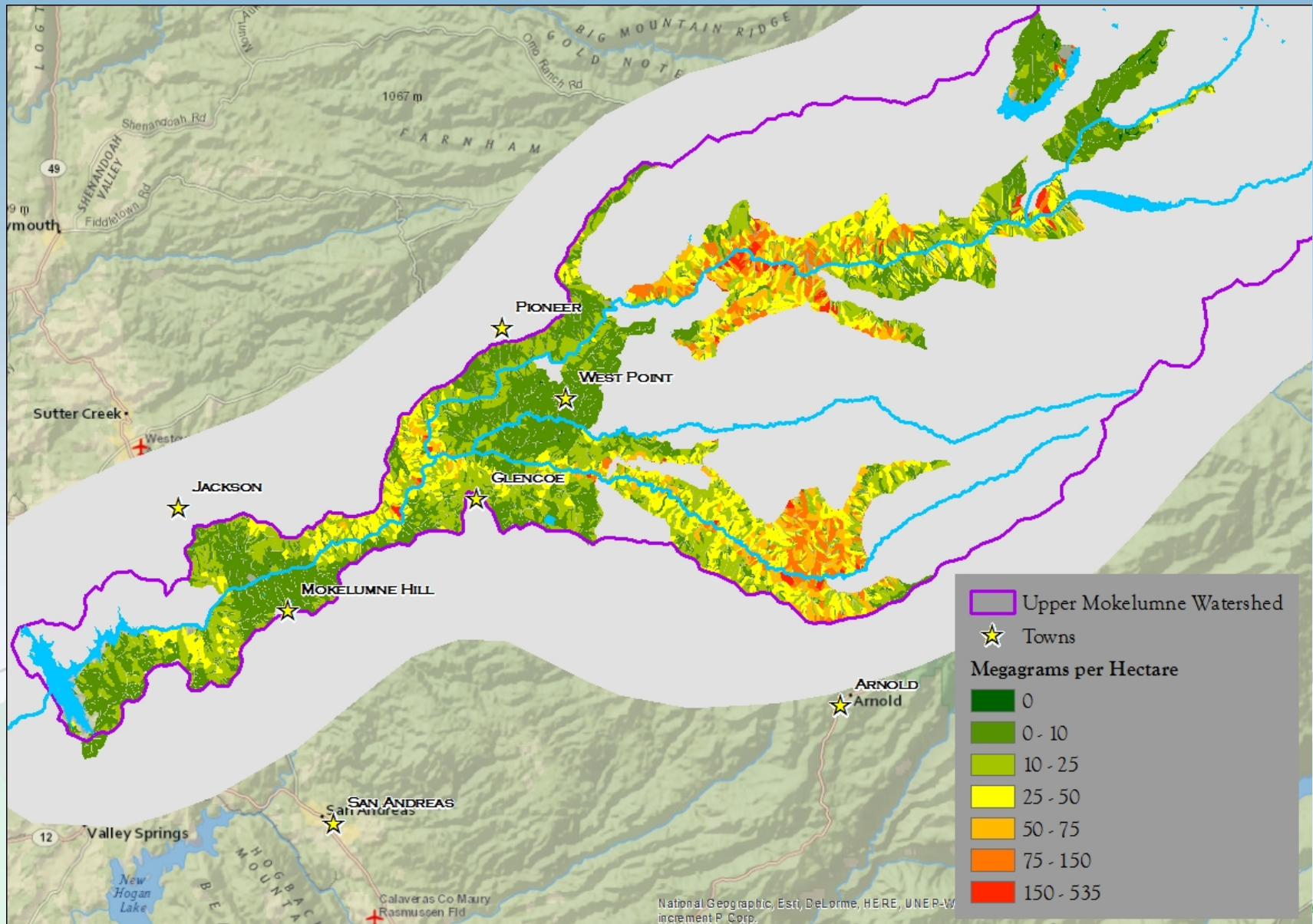


# Post-Treatment Fires

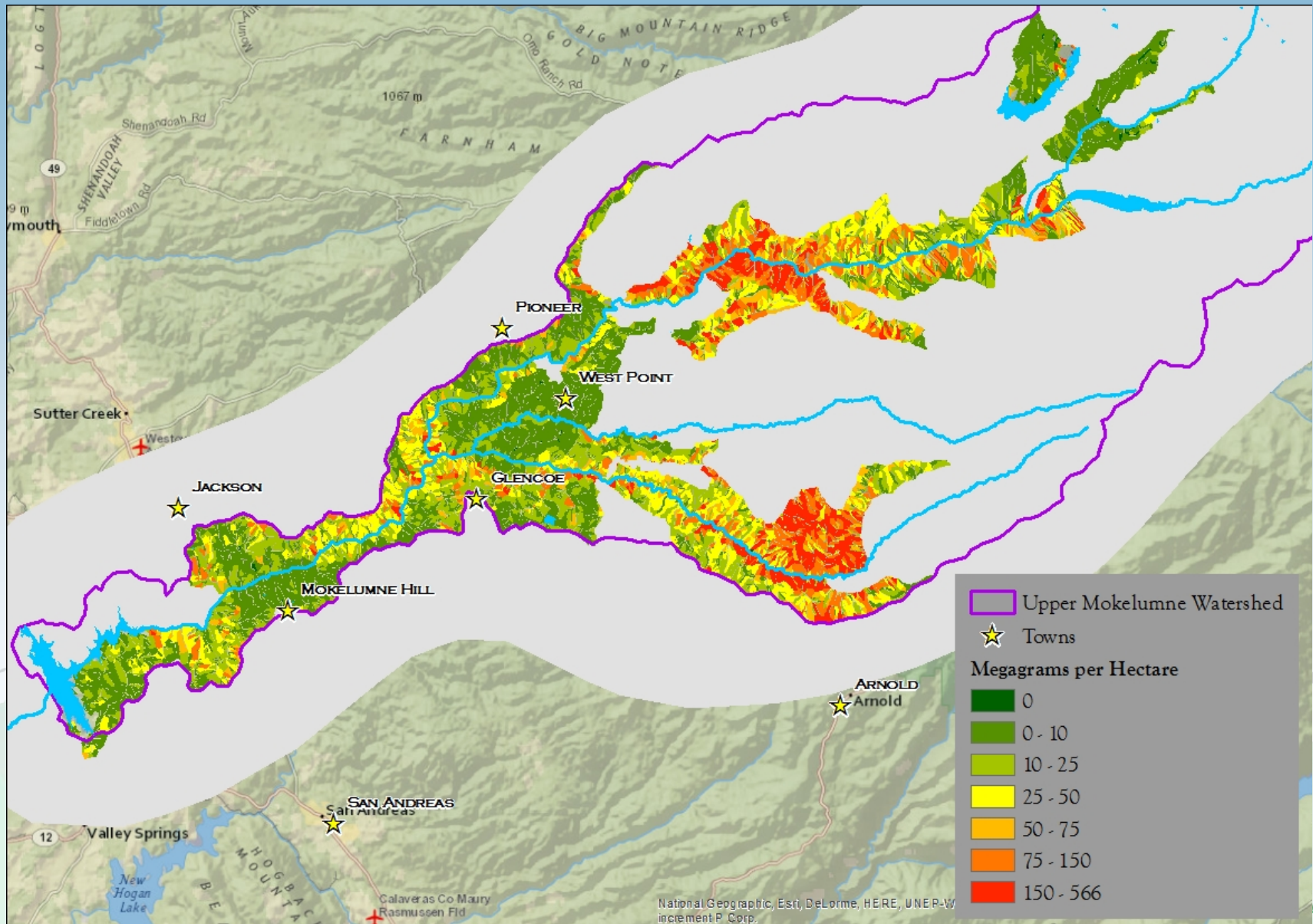




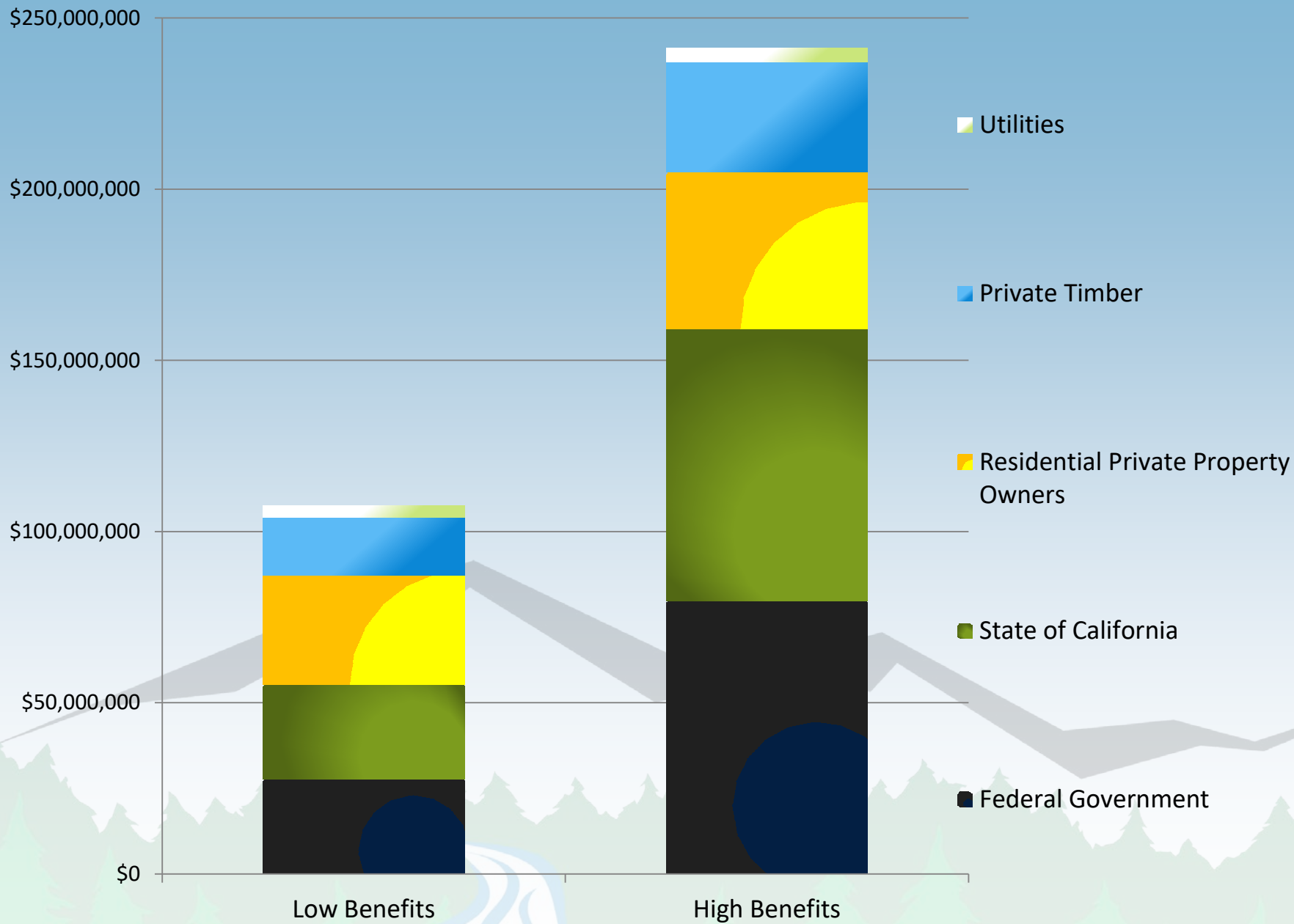
# Post-Fire: Treatments and Erosion of <2mm Sized Sediment



# Post-Fire: Erosion of <2mm-Sized Sediment with no Treatments





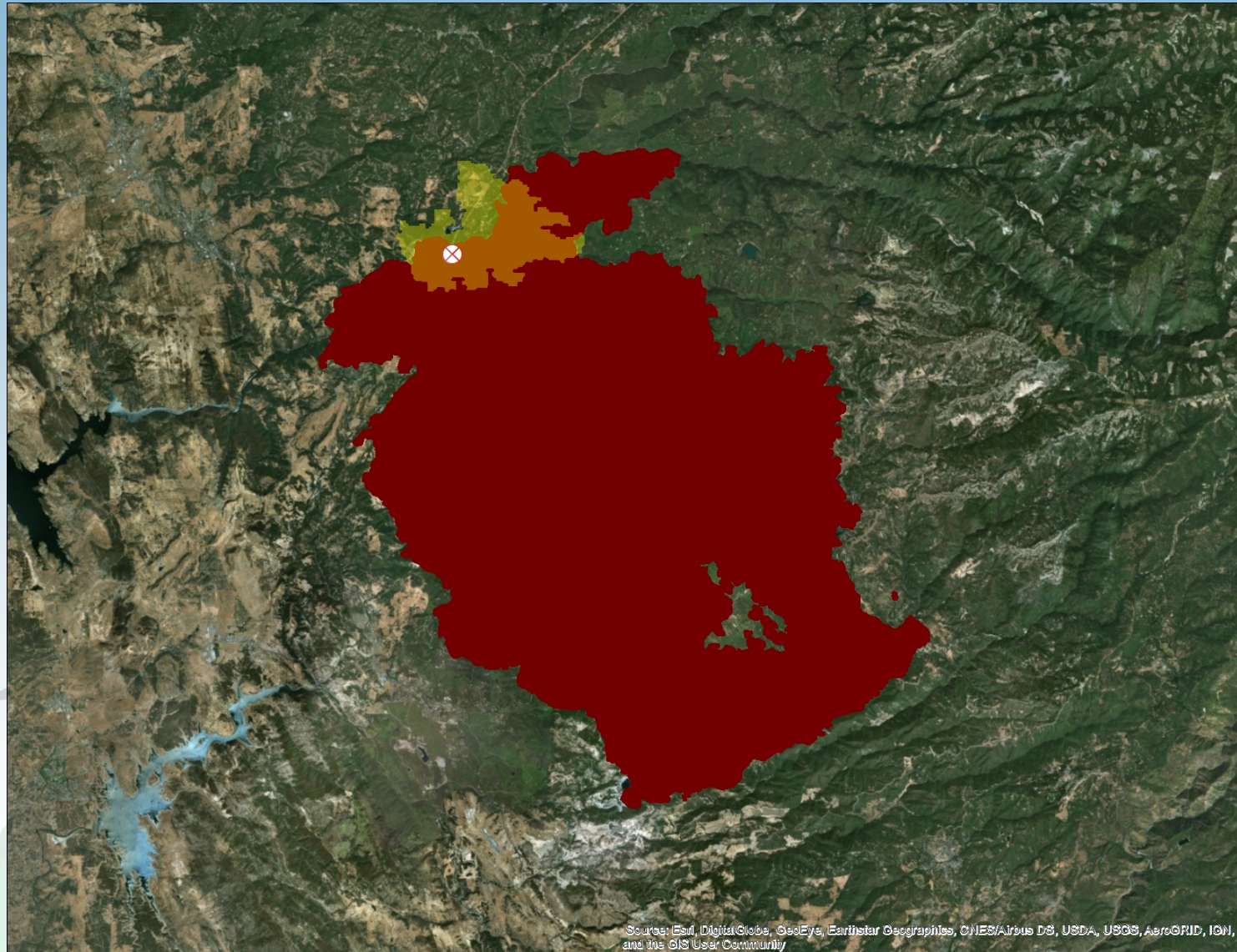


# Key Findings

- **Fuel treatments can significantly reduce the size and intensity of wildfires**
- **The economic benefits of fuel treatments can be three or more times the costs**
- **There are many beneficiaries from increased fuel treatments, especially taxpayers**
- **The estimated volume of sediment from post-fire is estimated to be large, however the avoided costs to downstream utilities were less than anticipated**

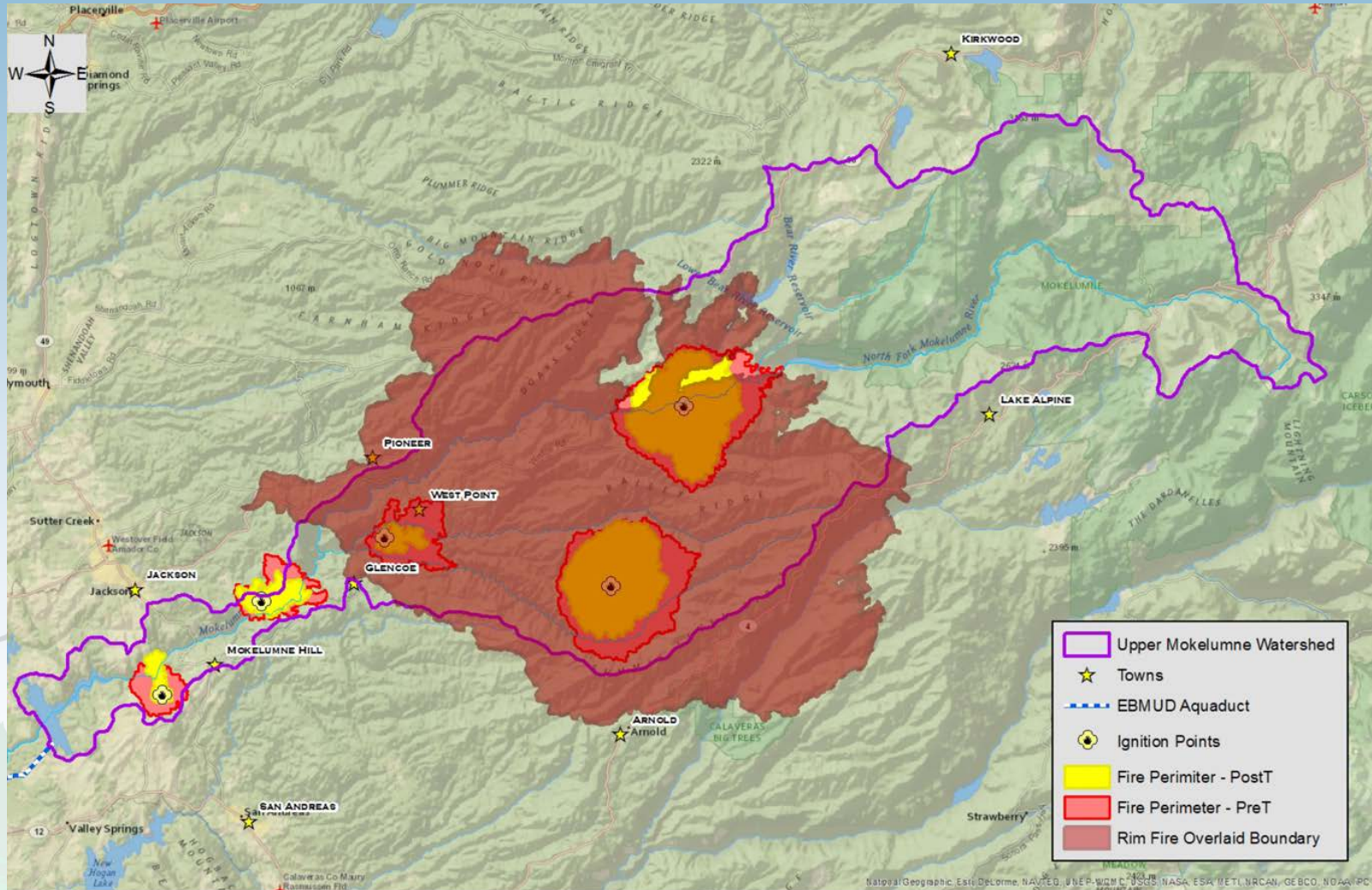


# Butte Fire – Modeled vs Reality



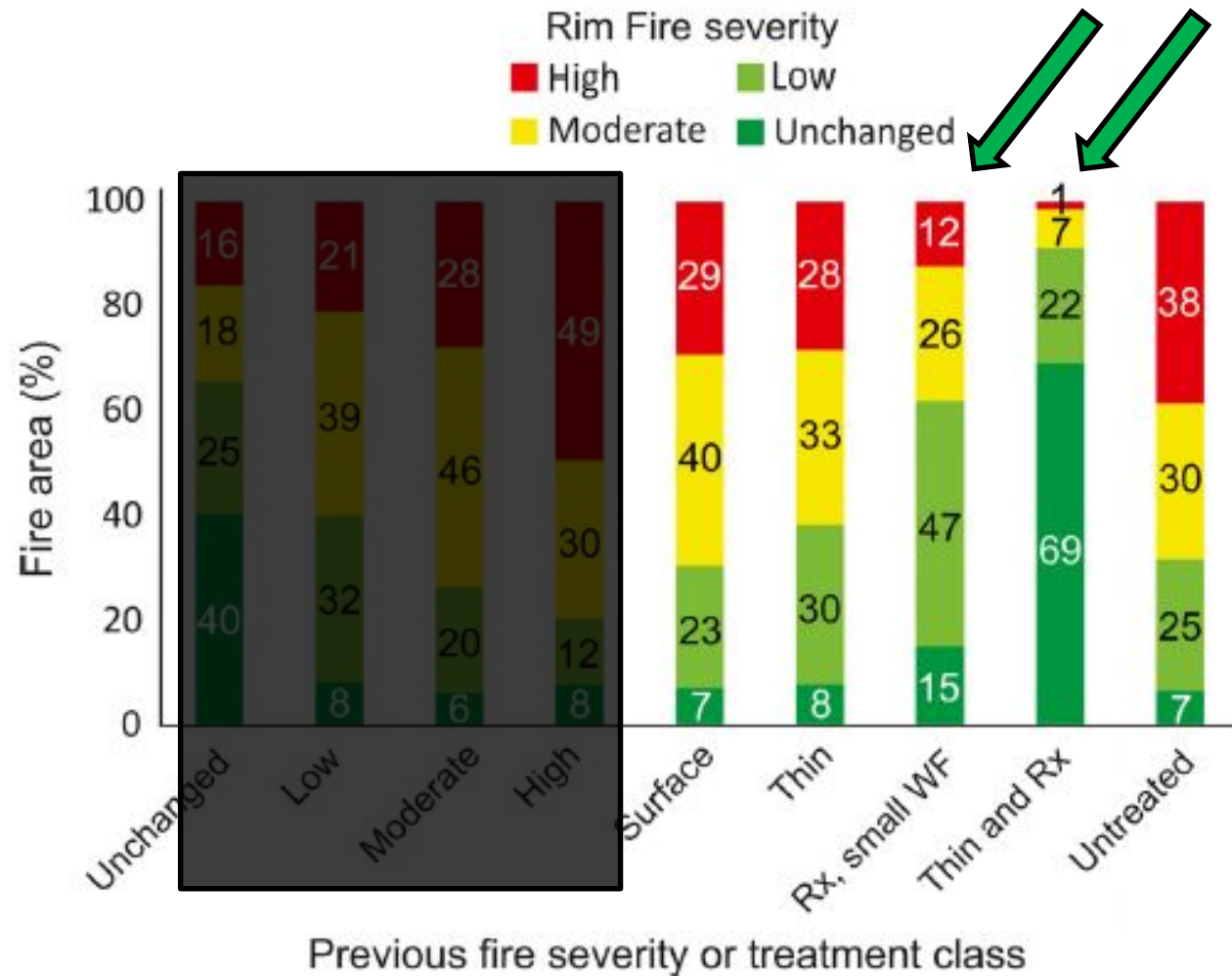


# Rim Fire Perimeter on Mokelumne Watershed & Modeled Fires



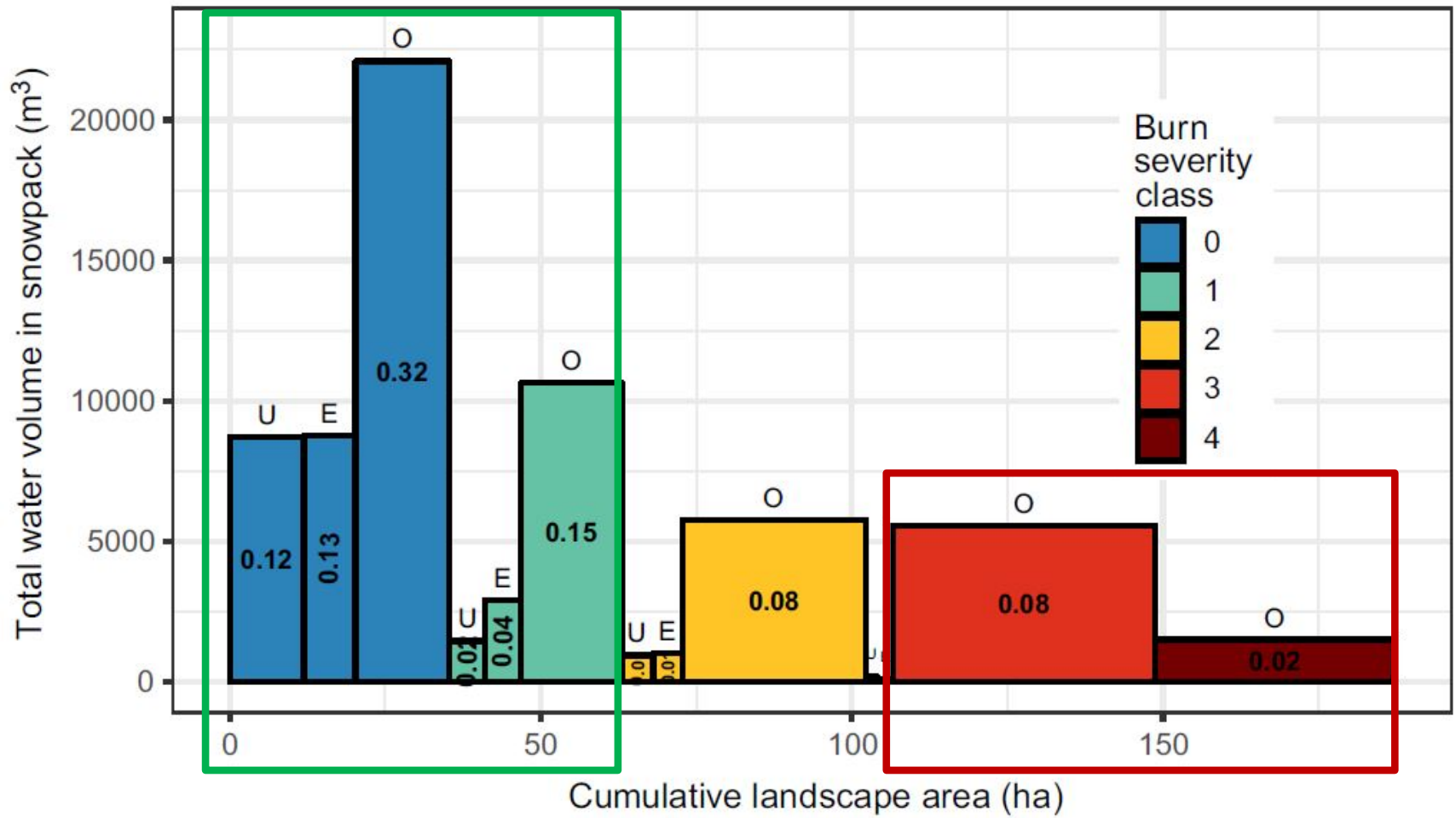


# Effectiveness of Treatments – Rim Fire



Source: Lydersen, Jamie M., et al. "Evidence of fuels management and fire weather influencing fire severity in an extreme fire event." *Ecological applications* (2017).

# Fire Severity and Snow



Source: Stevens, Jens T. "Scale-dependent effects of post-fire canopy cover on snowpack depth in montane coniferous forests." *Ecological Applications* (2017).

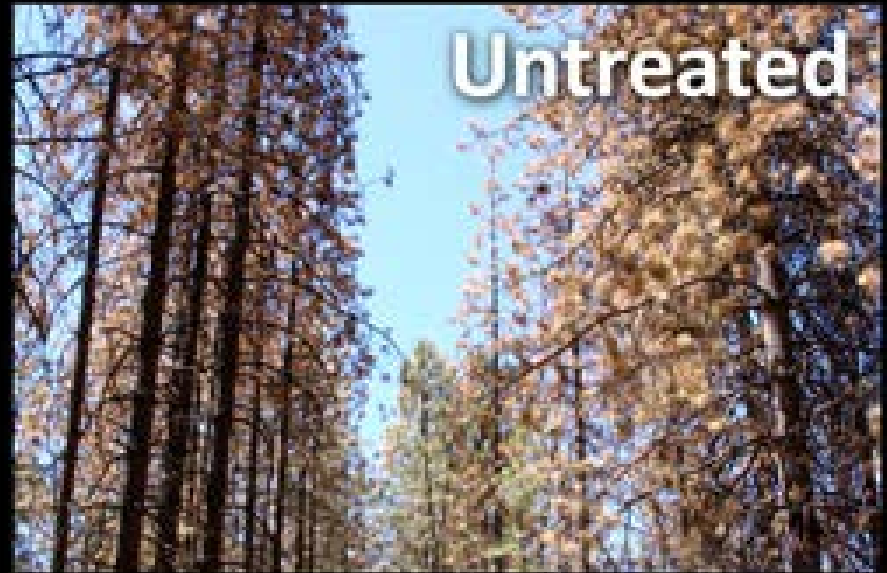


# Effectiveness of Treatments - Drought

Treated



Untreated



# Effectiveness of Treatments – Carbon Stored



Original photo  
courtesy of the  
U.S. Forest  
Service Pacific  
Southwest  
Research  
Station.

Research - Hood, Sharon M., et al. "Radial and stand-level thinning treatments: 15-year growth response of legacy ponderosa and Jeffrey pine trees." *Restoration Ecology* (2017).

[www.SIERRANEVADA.CA.GOV](http://www.SIERRANEVADA.CA.GOV)



# Master Stewardship Agreement

## USFS – UMRWA Partnership

- Exploratory joint workshop July 2015
- Cornerstone CLFR Project provides Stanislaus & Eldorado NFs special fed. restoration funding
- Mutual FS – UMRWA interests:
  - Restore Mokelumne Watershed
  - Facilitate federal expenditures in the Watershed
  - Leverage federal \$ with state \$
  - Use UMRWA's contracting efficiencies
  - Implement 'on the ground' projects quickly

## Master Stewardship Agreement (May 2016)

- Describes partnership goals (fuels reduction, water quality and water supply protection, reforestation)
- Prioritizes implementation of Cornerstone projects
- Requires Supplemental Project Agreements (SPAs)





# Master Stewardship Agreement

## UMRWA's Role Under the MSA

- Maintain planning, management and financial capabilities
- Explore project funding opportunities
- Work w/USFS to develop project-specific SPAs
- Fulfill CEQA requirements for SPA projects
- Provide qualified personnel & contractors to implement SPA projects
- Manage UMRWA contractors in coordination w/USFS

## Two Ongoing SPA Projects

- **Pumpkin Hollow** (2017) treats 971 total acres
  - SNC grant - \$500,000
  - USFS funds - \$609,000
- **Cabbage Patch** (2018) treats 1,219 total acres
  - SNC grant - \$500,000
  - USFS funds - \$702,000





# UMRWA MSA responsibilities:

## Grant writing and administration

- Secure grant \$ to fulfill USFS match requirements
- Seek other funds to defray UMRWA's uncovered costs

## Contracting

- Collaborate with FS on project specs
- Prepare/circulate Requests for Proposals
- Conduct contractor workshop(s)
- Conduct pre-proposal meetings for prospective proposers
- Review/select 'best qualified' proposers
- Enter into and administer General Service Agreements with selected contractors



# Intricacies of Implementation

## Project Implementation

- Job site pre-ops meetings
- Regular field inspections
- Facilitate FS approvals of completed units
- Process contractor invoices
- Invoice grant funding sources
- Maintain accounting and treasury functions







# UMRWA Accomplishments

## **Watershed Improvement Program**

Entered in a 10yr MSA Agreement with USFS

Completed Hemlock Project (SNF) CEQA

Secured two SNC grants totaling \$1M

Leveraged \$1.3 M in USFS project funding

Total acres authorized for treatment = 2,200

## **Water Resources Program**

- Mokelumne-Amador-Calaveras IRWM (Integrated Regional Water Management) Plan
- Secured three Prop. 84 grants for local infrastructure projects
- Total pass-thru grant funding = \$10.1M





# Progress Today and into the Future

## Increase the 'Pace and Scale' of Improvements in Mokelumne Watershed

### Challenges:

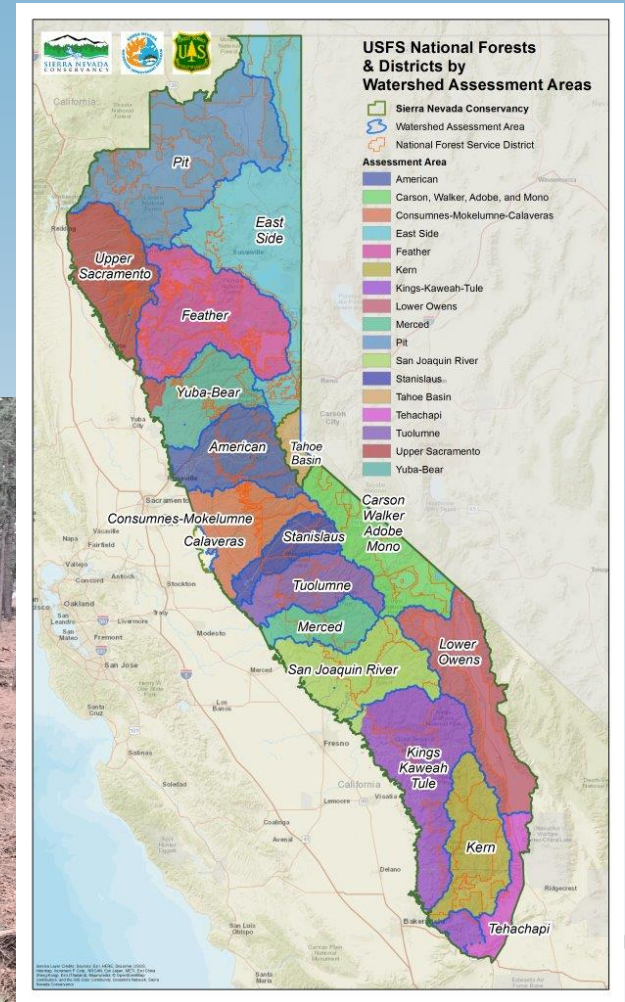
- Overcome FS staff shortages and high turnover
- Ensure ACCG support for partnership projects
- Establish sufficient bid-ready projects to compete for grants from multiple sources
- Organize projects in logical units for contracting
- Complete NEPA and CEQA requirements
- Maintain UMRWA organization depth







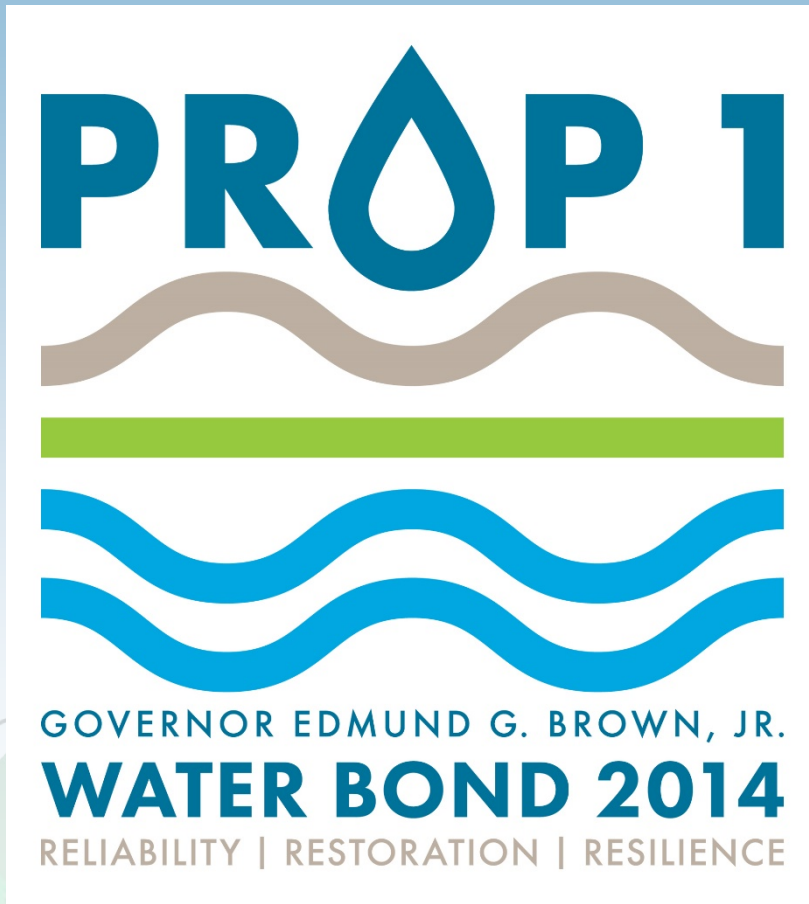
# Understanding Restoration Needs in the Sierra Nevada





[illegible]

# Continued Investment







# Questions/ Comments?

Mokelumne River  
above Pardee Reservoir  
April 2018